No. 16-2713

In the United States Court of Appeals For the Federal Circuit

THE CHAMBERLAIN GROUP, INC.,
Plaintiff – Appellee,

v.

TECHTRONIC INDUSTRIES CO. LTD.,
ET TECHNOLOGY (WUXI) CO. LTD.,
Defendants,

TECHTRONIC INDUSTRIES NORTH AMERICA, INC.,
ONE WORLD TECHNOLOGIES, INC., OWT INDUSTRIES, INC.,
RYOBI TECHNOLOGIES, INC.,
Defendants – Appellants.

On Appeal from the United States District Court for the
Northern District of Illinois, Eastern Division
Case No. 1:16-CV-06097, Hon. Harry D. Leinenweber

NONCONFIDENTIAL JOINT APPENDIX
Volume I, Pages Appx1 to Appx2776

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHER DISTRICT OF ILLINOIS
EASTERN DIVISION

THE CHAMBERLAIN GROUP, INC., Plaintiff, v. TECHTRONIC INDUSTRIES CO., LTD., TECHTRONIC INDUSTRIES NORTH AMERICA, INC., ONE WORLD TECHNOLOGIES, INC., OWT INDUSTRIES, INC., ET TECHNOLOGY (WUXI) CO. LTD., and RYOBI TECHNOLOGIES, INC., Defendants.	Case No. 16 C 6097 Judge Harry D. Leinenweber

REDACTED

MEMORANDUM OPINION AND ORDER

Before the Court is Plaintiff Chamberlain Group, Inc.'s Motion for a Preliminary Injunction [ECF No. 8]. For the reasons stated herein, the Court grants the Motion.

I. BACKGROUND

The Plaintiff, the Chamberlain Group, Inc. ("CGI"), based in Illinois, entered the Garage Door Opener ("GDO") market in 1958. Nine years later it introduced what was to become the market leading GDO, the Liftmaster. CGI has become well known for its development of safety measures and other innovative technologies and currently is the owner of approximately 350 patents. Currently GCI's Liftmaster is the number-one professionally installed GDO and its GDOs are present in a

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majority of garages in America. CGI has approximately a [redacted] market share in the GDO market. It also is the leader in the sale of ancillary products.

In 2003, CGI filed an application for a patent entitled Movable Barrier Operators Status Condition Transception Apparatus and Method, which was granted in 2007 as Patent No. 7,224,275 (the "'275 patent"). The invention was described as "a moveable barrier operator [with] a wireless status condition data transmitter that wirelessly transmits status condition messages to one or more remote peripherals." The '275 patent was to become the basis for CGI's subsequent product called MyQ Technology. The MyQ technology allows the owner, using a CGI smartphone app, to monitor and control the status of the GDO remotely.

In 2006, CGI filed an application for a patent entitled Barrier Movement Operator Battery Backup and Power Equipment Battery Charging Center, which was granted in 2009 as Patent No. 7,635,966 (the "'966 patent"). The invention was described as a battery back-up for a barrier movement operator, which is capable of being used to power tools often stored in garages.

The Defendants, Techtronic Industries Co. Ltd., Techtronic Industries North America, Inc., One World Technologies, Inc., OWT Industries, Inc., Et Technology (Wuxi) Co. Ltd., and Ryobi Technologies, Inc. (collectively, "TTI") sell products under an

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extensive portfolio of manufacturing brand names and also provide products for sale by third parties. TTI has considerable expertise in designing and selling power tools and accessories and owns a broad portfolio of intellectual property, including lithium-ion battery technology for portable, rechargeable batteries and battery charging stations. GDOs make up only a small portion of TTI's sales since it only recently extended into the GDO market.

In May of this year, TTI unveiled the Ryobi GDO, which it commenced selling through Home Depot's physical and on-line stores. CGI contends that the Ryobi GDO embodies the patented ideas expressed in its '275 and '966 parents. The Ryobi GDO includes a battery pack feature which is removable and can be used to power more than 70 Ryobi branded tools. The Ryobi GDO also includes a system for sending status updates wirelessly. When used in conjunction with the Ryobi smartphone app, the user is allowed to monitor and control the Ryobi GDO's status remotely, similar to CGI's MyQ system. At the time TTI introduced its Ryobi GDO, Home Depot was CGI's [redacted] customer and accounted for approximately [redacted] of CGI's retail GDO sales.

As a result of the introduction of the Ryobi GDO at Home Depot, CGI experienced an initial drop in sales for the two months succeeding the introduction. Since that time, Home Depot

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reduced the price for the CGI GDO products which apparently caused a substantial increase in sales of CGI's products. Home Depot retains sole authority to set pricing. Home Depot initially funded the price decrease but then requested that CGI provide it with a rebate to absorb some of the price differential. CGI initially did so, but subsequent efforts between CGI and Home Depot to agree on a fixed rebate broke down so that CGI is not funding any price decrease decided upon by Home Depot. CGI publishes manufacturer's suggested pricing but has no authority to enforce any specific pricing with regard to Home Depot. There was no sales information available as to current sales of CGI's products at Home Depot subsequent to the week ending July 24, 2016.

II. GENERAL RULES FOR PRELIMINARY INJUNCTION

CGI has filed this suit to enforce its intellectual property rights concerning, among others, the '275 and the '966 patents. They have now moved for a preliminary injunction to restrain TTI from selling its Ryobi GDOs and related products. To obtain a preliminary injunction the patent holder must establish four propositions: first, that it has a strong likelihood of success on the merits; second, that it is likely to suffer irreparable harm but for a preliminary injunction and therefore it has no adequate remedy at law; third, that equity heavily favors an injunction, *i.e.*, that the harm to the plaintiff greatly outweighs the harm to defendant; and, fourth, that the public interest weighs in favor of a preliminary injunction. *See, Abbott Laboratories v. Sandoz, Inc.*, 544 F.3d 1341, 1344 (Fed. Cir. 2008).

While at trial a defendant need prove invalidity by clear and convincing evidence, at the preliminary injunction stage the accused infringer need only show that there is a "substantial question as to the patent's invalidity or infringement." *LifeScan Scotland v. Shasta Techn.*, 734 F.3d 1361, 1366 (Fed. Cir. 2013).

Irreparable harm can assume a number of different forms, including lost market share, price erosion, lost goodwill and downstream sales. *See, Robert Bosch LLC v. Pyon Mfg. Corp.*, 659 F.3d 1142, 1151 (Fed. Cir. 2011). The mere possibility of irreparable harm is inconsistent with the characterization of injunctive relief as an extraordinary remedy and requires a "clear showing" that a plaintiff is entitled to relief. *Winter v. Natural Resources Defense Council, Inc.*, 555 U.S. 7, 22 (2008).

III. THE PATENTS IN SUIT

A. The '275 Patent

Claim 1: A moveable barrier operator comprising:
a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;

a movable barrier interface that is operably coupled to the controller;
a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:
corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

Claim 5: The movable barrier operator of claim 1 wherein the plurality of operating states includes at least one of:
moving a movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;
a lighting status change;
a vacation mode status change;
detecting a likely proximal presence of a vehicle;
and receiving an operating parameter alteration signal.

B. The '966 Patent

Claim 9: A battery charging apparatus, comprising:
a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery, the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment; and circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.
Claim 14: The battery charging apparatus of claim 9, wherein the electrically powered equipment comprises a tool.

IV. INFRINGEMENT OF THE '275 PATENT

TTI has a difficult task to demonstrate the lack of infringement by its Ryobi GDO since its technical expert, Dr. Madisetti, did not examine the Ryobi GDO. On the other hand, CGI's technical expert, Dr. Rhyne ("Rhyne"), purchased a Ryobi GDO and dismantled it and, with the assistance of CGI engineers, conducted extensive testing. Their testing included the use of WireShark protocol analyzer, which constitutes a method of capturing data as it is being transmitted by the Ryobi controller over WiFi link using the Ryobi router to a Media Access Control (MAC) address. From the results of the WireShark analysis, Rhyne was able to demonstrate the type of data transmitted and the addressee. Based on his examination and experience, Rhyne concluded that the Ryobi GDO met each of the elements of Claim 1 of the '275 patent. Rhyne explained that the crux of his infringement analysis revolved around the concept of the GDO controller being self-aware, *i.e.*, that it did not rely upon any external sensors to obtain the status conditions of the GDO, and which it was able to transmit upon request. Such status conditions include garage door open/shut, and garage lights on/off. According to his testimony, Rhyne's examination of the Ryobi GDO demonstrated to him that the GDO obtained and transmitted similar data without the aid of external sensors.

Rather than examine the Ryobi GDO and dispute Rhyne's findings, TTI's expert, Dr. Madisetti ("Madisetti", took issue with Rhyne's interpretation of some of the terms of Claim 1 of the '275 patent. In particular, Madisetti contended that Rhyne incorporated into his interpretation of Claim 1 the concept of a "self-aware" controller, which does not appear in the claim language. This is important because Madisetti argued that it is clear from the specific language of Claim 1, and reinforced by the language of dependent Claim 5, that the controller of Claim 1 is not totally self-aware, because many of the activities set forth in dependent Claim 5, such as detecting the presence of an obstacle, the proximal presence of a human, and the proximal presence of an vehicle must include the use of external sensors. Therefore self-awareness is not a limitation on the claim. This contention by Dr. Madisetti is more material to the issue of invalidity rather than the issue of infringement.

Rhyne responded to this criticism by pointing out that dependent Claim 2 distinguishes itself from Claim 1 by adding to Claim 1, "a condition status sensor that is operably coupled to the controller." Therefore the only reasonable way to reconcile the difference between Claim 1 and Claim 2 is that Claim 1 eschews condition sensors in favor of a controller that does not rely on external sensors. With respect to the list of operational states that do appear to require external sensors, Rhyne responded that the author appeared to include such operational states so as to claim such states which might through future invention be able to be sensed by the controller without external sensors.

Based on the foregoing, the Court at this time finds that CGI has established a likelihood of success on the issue of infringement of Claim 1 of the '275 patent by the Ryobi GDO. As the Court has indicated, the crux of the issue is the '275 patent's description of a self-aware controller in Claim 1. Rhyne's testimony on this point was convincing, and Madisetti, who did not examine the Ryobi GDO, did not effectively rebut evidence that it piggybacked on the '275's description of a self-aware controller defined by a plurality of operating states.

V. ALLEGED INVALIDITY OF THE '275 PATENT

TTI argues that without disagreement from CGI, that controllers, moveable barrier interfaces, and wireless transmitters were all well known in the art prior to the issuance of the '275 patent. Also, without disagreement from CGI, wireless transmitters, WiFi, the smart phone app, and smart phones are not covered by the patent in suit. TTI further argues that a number of prior references either include all of the limitations of the '275 claims or anticipated them.

Specifically, Dr. Madisetti relied on Menard, Tazuna and several other patents that described capabilities such as raising and lowering moveable barriers through the use of controllers that wirelessly transmitted various states of the moveable barriers. In response, Dr. Rhyne was able to show that in each reference, unlike with the '275 patent, the controller relied upon external sensors in order to receive the information to be transmitted wirelessly. Further, Rhyne was able to show that two prior art references, Morris and Chang, specifically involved communications between external sensors and the GDO controller, which then transmitted wirelessly the information so received from the sensors. Thus he argued the examiner clearly understood that the prior art covered the use of external sensors to communicate states or statuses to the controller and still approved the issuance of the '275 patent. In other words, the only way to distinguish the '275 patent from the prior art was for the examiner to conclude that the '275 patent does not rely on external sensors.

Because none of the prior art suggested by Dr. Madisetti taught the concept of the "self-aware" controller, TTI has not raised a "substantial question as to invalidity." *See, Amazon.com v. Barnesandnoble.com,* 239 F.3d 1343, 1359 (Fed. Cir. 2001).

VI. WHETHER THE RYOBI GDO INFRINGES THE '966 PATENT

TTI's argument as to non-infringement of the '966 patent is two-fold. First, it points out that the Ryobi GDO does not sell a battery with its GDO; the battery is sold separately. Thus it argues that the Ryobi GDO does not include "at least one rechargeable battery." Second, TTI argues that Claim 9 does not provide for the use of the battery as a backup, but as an alternate source for powering the barrier movement operator.

First, the dispute as to Claim 9: CGI responds by showing that TTI's advertisements all focus on the fact that its GDO includes a battery recharge station and that there are available for sale batteries that can be recharged in the recharging station that can also be used to operate power tools. CGI also argues that while Claim 9 does not specifically state that the battery is a backup source, nevertheless the "summary of the invention at column 1, line 54 and 55 clearly state that the invention is directed to a system including a rechargeable battery backup." The "detailed description, column 3, lines 19-26 states 'a rechargeable battery backup is provided for use with a barrier movement operator.'" Furthermore, figure 6 to the '966 patent shows the method of utilization of the removable rechargeable battery, which clearly shows its role as a backup power source.

As to TTI's other argument, the law suggests it is of little import whether TTI sells the backup battery in the actual box with the Ryobi GDO. As CGI pointed out in closing arguments, TTI sells the battery alongside the system, and this coupled with the design of a rechargeable station integrated into the Ryobi GDO could constitute potential direct infringement, or at least contributory infringement. *See, e.g.*, *Ricoh Co. v. Quanta Computer Inc.*, 5505 F.3d 1325, 1337-39 (Fed. Cir. 2008). This is especially true given the evidence that TTI's advertising juxtaposed both the battery and the GDO together, and that at one time TTI gave new purchasers of a Ryobi GDO a free battery. In short, the facts above demonstrate a likelihood that TTI's Ryobi GDO also infringes Chamberlain's '966 patent.

VII. ALLEGED INVALIDITY OF THE '966 PATENT

TTI further argues that the '966 patent was well known in the prior art, specifically citing the Peplinski and Weik patents. Peplinski describes the use of one or more batteries to provide backup power to the GDO in the event of an electric power outage. Weik provides two different scenarios regarding power sources or lack thereof. First, where a fire door is powered by AC and there is a power outage, the fire door is equipped with a socket which will allow a portable battery to be plugged into power the fire door. The battery is portable and is brought to the scene by a service person. The second scenario is where the fire door does not have AC power and a battery is permanently installed to operate the fire door.

It seems clear that neither prior art reference standing alone covers the '966 patent. But Dr. Madisetti testified that a person having ordinary skill in the art would combine the two references, such that the Peplinski battery would be removable as described in Weik. This is essentially an argument that the combination was obvious.

In response, Dr. Rhyne argued that neither Peplinski nor Weik describe a removable battery that can be used to power other devices and that the situation they seek to remedy is not relevant to the '966 patent. To argue against obviousness, Rhyne pointed to one of TTI's own documents describing "new innovation opportunities" in which it outlined possible steps to expand its tool market. One of the ideas listed on the document was a removable GDO battery that would be compatible in certain Sears power tools. He took the document to be a form of praise of the concept behind the '966 patent.

A patent is not necessarily invalid simply because it was obvious "to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it." *In re*

O'Farrell, 853 F.2d 894, 903 (Fed. Cir. 1988). It may well be that the combination in question was obvious; this case is young and the record is not yet fully developed. Registered patents are presumed valid, and TTI has not raised a substantial question at this juncture as to the '966 patent's invalidity based on obviousness or any other argument.

VIII. IRREPARABLE HARM

The Federal Circuit has held that irreparable harm requires a showing that, absent an injunction, the patentee is likely to suffer irreparable harm, and that a causal nexus exists relating the alleged harm to the alleged infringement. *See, Apple Inc. v. Samsung Electronics Co.*, 735 F.3d 1352, 1360 (Fed. Cir. 2013). The question is whether the allegations of harm are pertinent to the injunctive relief analysis or whether the patentee is merely seeking "to leverage its patent for competitive gain beyond that which the inventive contribution and value of the patent warrant." *Apple Inc. v. Samsung Electronics Co.*, 695 F.3d 1370, 1374 (Fed. Cir. 2012). As was testified to by CGI's economic expert, Christopher Bakewell, the types of harm that can occur from infringement by a direct competitor are lost sales and market share, price erosion, and loss of future sales, customer relationships, referrals, and accessories.

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The evidence produced at the hearing demonstrated that the Ryobi GDO is a direct competitor to the CGI GDO in the Home Depot market. They both are targeting customers who want "connected" GDOs, *i.e.*, those connected by the controller to smart phones through wireless transmissions. The evidence further showed that GDOs are relatively inelastic, since people normally are only in the market for GDOs if they are building a new home or garage or their existing GDO is in need of replacement. At the time of TTI's product launch in May, 2016, CGI had an approximate [redacted] market share of the GDO market. Genie had an approximate [redacted] of the market and "others" had the balance, approximately [redacted] Moreover, prior to the Ryobi launch, Home Depot accounted for approximately [redacted] of CGI's retail sales of GDOs.

While sales data of the Ryobi GDO were not available, the data did show a marked reduction in CGI sales immediately after the product launch. The evidence also showed that, after Home Depot made a significant unilateral reduction in price for CGI's signature unit, sales increased dramatically for the next 5 weeks. This fact alone suggests that the launch of the Ryobi GDO has caused price erosion. The evidence further showed that Home Depot has requested that CGI contribute to the cost of the price reduction through the form of rebates. CGI was willing to do so on a short-term basis, but negotiations for a more

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permanent arrangement at this time had fallen through. The Court finds that there is clear evidence of price erosion caused by the Ryobi product launch.

While there is no clear evidence that there will be a reduction in CGI's market share, nevertheless basic economic reasoning dictates that it should be suspected. Assuming that the Ryobi introduction at Home Depot is successful (there is some circumstantial evidence that it is successful, such as preferential product location and advertising in Home Depot), there has to be some loss of market share on CGI's part. Since the product is relatively inelastic, a sale of a Ryobi GDO most likely comes at the expense of one of the other brands. Since CGI has almost [redacted] times the market share of Genie, one would expect that for every four Ryobi GDOs sold by Home Depot [redacted] would be lost by CGI and [redacted] by Genie.

The evidence also showed the sale of accessories are a very profitable part of the GDO market and that accessory sales accounted for approximately [redacted] of CGI's gross profit. Consequently, loss of market share of GDOs would have a substantial impact on the overall gross profit picture. There is a substantial risk of loss of market share, profits, and price erosion that would be directly connected to the entry of the TTI Ryobi GDO. The Court thus finds that CGI will suffer irreparable harm if a preliminary injunction is not granted.

The Court pauses for an important note: the above analysis regarding irreparable harm bears only on the Court's ultimate decision on CGI's '275 patent. That is because, as at least two witnesses noted at the hearing, CGI's GDOs currently do not practice the '966 patent relating to the removable backup battery. CGI has not sold commercially a GDO including the technology behind that patent. That necessarily means that the concerns regarding market share, price erosion, and lost profits have no applicability as to the '966 patent. CGI therefore has not proven irreparable harm based on infringement of the '966 patent.

IX. THE BALANCE OF HARDSHIPS

The evidence showed that the GDO market is not significant from TTI's perspective. TTI has a multibillion dollar business of which GDOs constitute no more than one percent of its business. Prior to May of this year it had not sold a single GDO, and since the Court has agreed to hold the trial as early as February 2017, a delay of four months, while harmful, would not be critical to the health of TTI. On the other hand, GDOs are the core business of CGI and a loss would be much more serious to CGI than it would be to TTI. The Court therefore finds that balance of hardships favors CGI. Certainly if TTI is successful at trial, a judgment of money damages would redress any wrong an injunction might impose.

X. THE PUBLIC INTEREST

While increased competition arguably is in the public interest, nevertheless protecting the interests of patent holders is also in the public interest because a strong, viable patent system inevitably leads to increased innovation. Here, as in *Apple Inc. v. Samsung Electronics Co.*, 809 F.3d 633, 647 (Fed. Cir. 2015), an injunction would not keep some lifesaving drug off the market; rather it would make the marketing of GDOs more orderly and allow a final resolution of the issue of infringement and invalidity.

XI. CONCLUSION

For the reasons stated herein, the Court grants CGI's Motion for a Preliminary Injunction [ECF No. 8]. The Court's decision relates to the finding that CGI has carried its burden in requesting a preliminary injunction only as to the '275 patent.

IT IS SO ORDERED.

Harry D. Leinenweber, Judge
United States District Court

Dated: SEP 15 2016

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

THE CHAMBERLAIN GROUP, INC., Plaintiff, v. TECHTRONIC INDUSTRIES CO. LTD., TECHTRONIC INDUSTRIES NORTH AMERICA, INC., ONE WORLD TECHNOLOGIES INC., OWT INDUSTRIES, INC., ET TECHNOLOGY (WUXI) CO. LTD., AND RYOBI TECHNOLOGIES, INC. Defendants.	)	Civil Action No. 1:16-cv-06097 The Honorable Harry D. Leinenweber

PRELIMINARY INJUNCTION ORDER

This patent infringement action is brought by plaintiff, The Chamberlain Group, Inc. ("CGI"), against defendants Techtronic Industries Co. Ltd.; Techtronic Industries North America, Inc.; One World Technologies Inc.; OWT Industries, Inc.; Et Technology (Wuxi) Co. Ltd.; and Ryobi Technologies, Inc., pursuant to 35 U.S.C. § 101 et seq. CGI asserts that defendants infringe two CGI patents: United States Patent Nos. 7,224,275 ("'275 Patent") and 7,635,966.

On June 10, 2016, CGI filed a motion and memorandum seeking a preliminary injunction. On August 2, 2016, Techtronic Industries North America, Inc.; One World Technologies Inc.; OWT Industries, Inc.; and Ryobi Technologies, Inc. filed a response. On August 24, 2016, CGI filed a reply. The parties presented witnesses and argument to the Court during an evidentiary hearing held August 29 to August 31, 2016.

Having considered the evidence, the Court GRANTS CGI's motion, in part, as to the '275 Patent. The Court has issued a Memorandum Opinion supporting this Order.

Therefore:

IT IS ORDERED that, pursuant to the Court's Memorandum Opinion and Federal Rule of Civil Procedure Rule 65, Techtronic Industries North America, Inc.; One World Technologies Inc.; OWT Industries, Inc.; and Ryobi Technologies, Inc., its officers, directors, agents, servants, representatives, employees, attorneys, and those persons in active concert or participation with Techtronic Industries North America, Inc.; One World Technologies Inc.; OWT Industries, Inc.; and Ryobi Technologies, Inc. and who receive actual notice of this Order by personal service or otherwise, shall be and hereby are enjoined and restrained from making, using, selling, or offering to sell in the United States or importing into the United States the Ryobi GD200 garage door opener in a configuration that infringes claims 1 and 5 of the '275 Patent under the Court's Memorandum Opinion or products that are not colorably different therefrom. The Court has approved CGI's bond in the amount of $7,500,000 to secure payment of any damages sustained by defendants if they are later found to have been wrongfully enjoined.

IT IS FURTHER ORDERED that this Order shall be and hereby is effective until further Order of the Court.

Dated: September 20, 2016

Honorable Harry D. Leinenweber

AO279,APPEAL,SCHENKIER

United States District Court
Northern District of Illinois - CM/ECF LIVE, Ver 6.1.1 (Chicago)
CIVIL DOCKET FOR CASE #: 1:16-cv-06097

The Chamberlain Group, Inc. v. Techtronic Industries Co., Ltd. et al
Assigned to: Honorable Harry D. Leinenweber
related Case: 1:16-cv-06094
Case in other court: 16-02713
Cause: 15:1126 Patent Infringement

Date Filed: 06/10/2016
Jury Demand: Plaintiff
Nature of Suit: 830 Patent
Jurisdiction: Federal Question

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TERMINATED: 06/30/2016

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TERMINATED: 06/30/2016

Defendant

Techtronic Industries North America, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka (See above for address) TERMINATED: 06/30/2016

Defendant

One World Technologies, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED

James P. Looby
(See above for address)
TERMINATED: 06/30/2016

Michael J. Abernathy
(See above for address)
ATTORNEY TO BE NOTICED

Nicholas A. Restauri
(See above for address)
ATTORNEY TO BE NOTICED

Sanjay K. Murthy
(See above for address)
ATTORNEY TO BE NOTICED

Thomas F Hurka
(See above for address)
TERMINATED: 06/30/2016

Defendant

OWT Industries, Inc. represented by Jason C. White
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

James P. Looby
(See above for address)
TERMINATED: 06/30/2016

Michael J. Abernathy
(See above for address)
ATTORNEY TO BE NOTICED

Nicholas A. Restauri
(See above for address)
ATTORNEY TO BE NOTICED

Sanjay K. Murthy
(See above for address)
ATTORNEY TO BE NOTICED

Thomas F Hurka
(See above for address)
TERMINATED: 06/30/2016

Defendant

Et Technology (Wuxi) Co. Ltd. represented by Jason C. White
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Nicholas A. Restauri

(See above for address)
ATTORNEY TO BE NOTICED

Defendant

Ryobi Technologies, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka (See above for address) TERMINATED: 06/30/2016

Counter Claimant

One World Technologies, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka

(See above for address)
TERMINATED: 06/30/2016

Counter Claimant

Techtronic Industries North America, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka (See above for address) TERMINATED: 06/30/2016

Counter Claimant

Ryobi Technologies, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka (See above for address) TERMINATED: 06/30/2016

Counter Claimant

OWT Industries, Inc.	represented by	Jason C. White (See above for address) LEAD ATTORNEY ATTORNEY TO BE NOTICED James P. Looby (See above for address) TERMINATED: 06/30/2016 Michael J. Abernathy (See above for address) ATTORNEY TO BE NOTICED Nicholas A. Restauri (See above for address) ATTORNEY TO BE NOTICED Sanjay K. Murthy (See above for address) ATTORNEY TO BE NOTICED Thomas F Hurka (See above for address) TERMINATED: 06/30/2016

V.

Counter Defendant

The Chamberlain Group, Inc.	represented by	Katherine Vidal (See above for address) LEAD ATTORNEY PRO HAC VICE ATTORNEY TO BE NOTICED Benjamin C. Elacqua (See above for address) ATTORNEY TO BE NOTICED Maria Elena Stiteler (See above for address) PRO HAC VICE ATTORNEY TO BE NOTICED Matthew R. Mccullough (See above for address) ATTORNEY TO BE NOTICED Michael R. Rueckheim (See above for address) ATTORNEY TO BE NOTICED

Nicole L. Little
(See above for address)
ATTORNEY TO BE NOTICED

Date Filed	#	Docket Text
06/10/2016	1	COMPLAINT filed by The Chamberlain Group, Inc.; Jury Demand. Filing fee $ 400, receipt number 0752-12032060. (Attachments: # 1 Exhibit A - U.S. Patent No. 7,635,966, # 2 Exhibit B - U.S. Patent No. 7,224,275)(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	2	CIVIL Cover Sheet (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	3	ATTORNEY Appearance for Plaintiff The Chamberlain Group, Inc. by Nicole L. Little (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	4	Local Rule 3.4 Notice Of Claims Involving Patents by The Chamberlain Group, Inc. (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	5	NOTIFICATION of Affiliates pursuant to Local Rule 3.2 by The Chamberlain Group, Inc. (Little, Nicole) (Entered: 06/10/2016)
06/10/2016		CASE ASSIGNED to the Honorable Thomas M. Durkin. Designated as Magistrate Judge the Honorable Sidney Schenkier. (daj,) (Entered: 06/10/2016)
06/10/2016		SUMMONS Issued as to Defendants Et Technology (Wuxi) Co. Ltd., OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. (jp,) (Entered: 06/10/2016)
06/10/2016	6	MOTION for Leave to Appear Pro Hac Vice Filing fee $ 50, receipt number 0752-12032932. (Vidal, Katherine) (Entered: 06/10/2016)
06/10/2016	7	MOTION by Plaintiff The Chamberlain Group, Inc. for leave to file excess pages (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	8	MOTION by Plaintiff The Chamberlain Group, Inc. for preliminary injunction (Public Redacted Version) (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	9	DECLARATION of Ron Brogle regarding motion for preliminary injunction 8 (Public Redacted Version) (Attachments: # 1 Exhibit A (Under Seal), # 2 Exhibit B (Under Seal), # 3 Exhibit C (Under Seal), # 4 Exhibit D (Under Seal), # 5 Exhibit E (Under Seal), # 6 Exhibit F (Under Seal))(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	10	DECLARATION of Maria Elena Stiteler regarding motion for preliminary injunction 8 (Attachments: # 1 Exhibit A - US 20100156182, # 2 Exhibit B - Notice of rejection 12426356, # 3 Exhibit C - Abandonment 12426356, # 4 Exhibit D - Ryobi Website, # 5 Exhibit E - Mertel LinkedIn profile, # 6 Exhibit F - Youtube TIA transcript, # 7 Exhibit G - Facebook comments, # 8 Exhibit H - Ryobi Tools website, # 9 Exhibit I - Youtube edited, # 10 Exhibit J - TIA comments, # 11 Exhibit K - Toolguyd comments, # 12 Exhibit L - Garage journal forum, # 13 Exhibit M - THD Ryobi search results, # 14 Exhibit N - Ryobi GD200 Manual, # 15 Exhibit O - THD.com screenshot, # 16 Exhibit P - THD.com screenshot, # 17 Exhibit Q - Techtronic Annual Report 2006 excerpts, # 18 Exhibit R - Techtronic Annual Report 2011 excerpts, # 19 Exhibit S - Techtronic Annual Report 2015 excerpts, # 20 Exhibit T - THD.com screenshot, # 21 Exhibit U - THD.com screenshot, # 22 Exhibit V - THD.com screenshot, # 23 Exhibit W - THD.com screenshot)(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	11	DECLARATION of Colin Willmott regarding motion for preliminary injunction 8

		(Attachments: # 1 Exhibit A - Willmott Patents, # 2 Exhibit B - Duchossois History, # 3 Exhibit C - CGI History, # 4 Exhibit D - Dasma article, # 5 Exhibit E - CGI patents) (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	12	DECLARATION of John Fitzgerald regarding motion for preliminary injunction 8 (Public Redacted Version) (Attachments: # 1 Exhibit A (Under Seal), # 2 Exhibit B - Index of CGIs Third-Party Awards and Praise, # 3 Exhibit C - Index of Third-Party Awards and Praise for MyQ Technology, # 4 Exhibit D (Under Seal), # 5 Exhibit E - THD Fathers Day advertising, # 6 Exhibit F - THD Product Display, # 7 Exhibit G - THD.com Ultra-Quiet GDO, # 8 Exhibit H - THD CGI GDO, # 9 Exhibit I (Under Seal)) (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	13	DECLARATION of V. Thomas Rhyne regarding motion for preliminary injunction 8 (Public Redacted Version) (Attachments: # 1 Exhibit A - Rhyne Resume, # 2 Exhibit B - List of Materials Considered, # 3 Exhibit C - US7635966, # 4 Exhibit D - US7224275, # 5 Exhibit E (Under Seal), # 6 Exhibit F (Under Seal), # 7 Exhibit G (Under Seal), # 8 Exhibit H (Under Seal), # 9 Exhibit I - CGI User Manual, # 10 Exhibit J (Under Seal), # 11 Exhibit K (Under Seal), # 12 Exhibit L - Ryobi User Manual, # 13 Exhibit M - Internal Photos, # 14 Exhibit N - Connected Garage Door Operators model numbers) (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	14	SEALED MOTION by Plaintiff The Chamberlain Group, Inc. for Preliminary Injunction (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	15	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of Ron Brogle in Support of Plaintiff's Memorandum in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E, # 6 Exhibit F)(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	16	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of John Fitzgerald in Support of Plaintiff's Memorandum in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit A, # 2 Exhibit D, # 3 Exhibit I)(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	17	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of V. Thomas Rhyne in Support of Plaintiff's Memorandum in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit E, # 2 Exhibit F, # 3 Exhibit G, # 4 Exhibit H, # 5 Exhibit J, # 6 Exhibit K)(Little, Nicole) (Entered: 06/10/2016)
06/10/2016	18	MOTION by Plaintiff The Chamberlain Group, Inc. to seal document sealed document, 16 , sealed document, 17 , SEALED MOTION by Plaintiff The Chamberlain Group, Inc. for Preliminary Injunction 14 , sealed document, 15 (Little, Nicole) (Entered: 06/10/2016)
06/10/2016	19	NOTICE of Motion by Nicole L. Little for presentment of motion for leave to file excess pages 7 , motion to seal document, motion for relief,,,,,,,, 18 , Sealed motion 14 , motion for preliminary injunction 8 before Honorable Thomas M. Durkin on 6/14/2016 at 09:00 AM. (Little, Nicole) (Entered: 06/10/2016)
06/13/2016	20	ATTORNEY Appearance for Defendants Et Technology (Wuxi) Co. Ltd., OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Jason C. White (White, Jason) (Entered: 06/13/2016)
06/13/2016	21	ATTORNEY Appearance for Defendants Et Technology (Wuxi) Co. Ltd., OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Nicholas A. Restauri (Restauri, Nicholas) (Entered: 06/13/2016)

06/13/2016	22	SUMMONS Returned Executed by The Chamberlain Group, Inc. as to One World Technologies, Inc. on 6/13/2016, answer due 7/4/2016. (Little, Nicole) (Entered: 06/13/2016)
06/13/2016	23	SUMMONS Returned Executed by The Chamberlain Group, Inc. as to OWT Industries, Inc. on 6/13/2016, answer due 7/4/2016. (Little, Nicole) (Entered: 06/13/2016)
06/13/2016	24	SUMMONS Returned Executed by The Chamberlain Group, Inc. as to Ryobi Technologies, Inc. on 6/13/2016, answer due 7/4/2016. (Little, Nicole) (Entered: 06/13/2016)
06/13/2016	25	SUMMONS Returned Executed by The Chamberlain Group, Inc. as to Techtronic Industries North America, Inc. on 6/13/2016, answer due 7/4/2016. (Little, Nicole) (Entered: 06/13/2016)
06/13/2016	26	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Nicholas A. Restauri - CORRECTED (Restauri, Nicholas) (Entered: 06/13/2016)
06/13/2016	27	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Jason C. White - CORRECTED (White, Jason) (Entered: 06/13/2016)
06/14/2016	28	MOTION for Leave to Appear Pro Hac Vice Filing fee $ 50, receipt number 0752-12038511. (Elacqua, Benjamin) (Entered: 06/14/2016)
06/14/2016	29	MOTION for Leave to Appear Pro Hac Vice Filing fee $ 50, receipt number 0752-12038559. (Stiteler, Maria) (Entered: 06/14/2016)
06/14/2016	30	ATTORNEY Appearance for Plaintiff The Chamberlain Group, Inc. by Michael R. Rueckheim (Rueckheim, Michael) (Entered: 06/14/2016)
06/14/2016	31	MINUTE entry before the Honorable Thomas M. Durkin:Plaintiff's motion for leave to file excess pages 7 is granted. Plaintiff's motion for preliminary injunction 8 14 is entered and continued. Plaintiff's motion to seal its motion for preliminary injunction and accompanying declarations 18 is granted. Motion hearing held on 6/14/2016. In chambers conference on patent cases is set for 6/17/2016 at 02:00 PM.Mailed notice (srn,) (Entered: 06/14/2016)
06/14/2016	32	MINUTE entry before the Honorable Thomas M. Durkin:Applications to appear pro hac vice 28 29 6 are granted. Attorneys Katherine Vidal, Benjamin C. Elacqua, Maria Elena Stiteler for The Chamberlain Group, Inc. added. Mailed notice (srn,) (Entered: 06/14/2016)
06/14/2016	33	MAILED Patent report to Patent Trademark Office, Alexandria VA. (aee,) (Entered: 06/14/2016)
06/14/2016	34	ATTORNEY Appearance for Plaintiff The Chamberlain Group, Inc. by Matthew R. Mccullough (Mccullough, Matthew) (Entered: 06/14/2016)
06/17/2016	35	TRANSCRIPT OF PROCEEDINGS held on 6/14/16 before the Honorable Thomas M. Durkin. Motion hearing. Court Reporter Contact Information: Laura Renke, laura_renke@ilnd.uscourts.gov, 312.435.6053. IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or

		PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings. Redaction Request due 7/8/2016. Redacted Transcript Deadline set for 7/18/2016. Release of Transcript Restriction set for 9/15/2016. (Renke, Laura) (Entered: 06/17/2016)
06/17/2016	37	MINUTE entry before the Honorable Thomas M. Durkin:In chambers conference held on 6/17/2016. Preliminary Injunction hearing set for 8/29/2016 at 09:30 AM.Mailed notice (srn,) (Entered: 06/21/2016)
06/20/2016	36	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Sanjay K. Murthy (Murthy, Sanjay) (Entered: 06/20/2016)
06/22/2016	38	NOTICE by The Chamberlain Group, Inc. re declaration,,,, 10 , sealed document, 15 Of Corrected Exhibits To The Motion For Preliminary Injunction (Attachments: # 1 Exhibit O to Stiteler Declaration - Corrected, # 2 Exhibit P to Stiteler Declaration - Corrected, # 3 Exhibit T to Stiteler Declaration - Corrected, # 4 Exhibit U to Stiteler Declaration - Corrected, # 5 Exhibit V to Stiteler Declaration - Corrected, # 6 Exhibit W to Stiteler Declaration - Corrected, # 7 Exhibit B to the Brogle Declaration - Corrected (Sealed Placeholder))(Little, Nicole) (Entered: 06/22/2016)
06/22/2016	39	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. Exhibit B to the Brogle Declaration - Corrected (Little, Nicole) (Entered: 06/22/2016)
06/22/2016	40	MOTION by Plaintiff The Chamberlain Group, Inc. to seal document sealed document 39 (Little, Nicole) (Entered: 06/22/2016)
06/22/2016	41	NOTICE of Motion by Nicole L. Little for presentment of motion to seal document, motion for relief 40 before Honorable Thomas M. Durkin on 7/5/2016 at 09:00 AM. (Little, Nicole) (Entered: 06/22/2016)
06/24/2016	42	MINUTE entry before the Honorable Thomas M. Durkin:Plaintiff's motion to file a corrected exhibit to its motion for preliminary injunction under seal 40 is granted. No appearance is required on 7/5/2016. Mailed notice (srn,) (Entered: 06/24/2016)
06/28/2016	43	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Michael J. Abernathy (Abernathy, Michael) (Entered: 06/28/2016)
06/28/2016	44	Joint Notice of Service on Techtronic Industries Co. Ltd. by The Chamberlain Group, Inc. (Little, Nicole) (Entered: 06/28/2016)
06/29/2016	45	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by Thomas F Hurka (Hurka, Thomas) (Entered: 06/29/2016)
06/29/2016	46	ATTORNEY Appearance for Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. by James P. Looby (Looby, James) (Entered: 06/29/2016)
06/29/2016	47	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries Co., Ltd., Techtronic Industries North America, Inc. to withdraw the Appearances of Thomas Hurka and James Looby (White, Jason) (Entered: 06/29/2016)

06/29/2016	48	NOTICE of Motion by Jason C. White for presentment of motion to withdraw, 47 before Honorable Thomas M. Durkin on 7/13/2016 at 09:00 AM. (White, Jason) (Entered: 06/29/2016)
06/30/2016	49	MINUTE entry before the Honorable Thomas M. Durkin:Defendants' motion to withdraw attorney 47 is granted; Attorney Thomas F Hurka and James P. Looby terminated. No appearance is required on 7/13/2016. Mailed notice (srn,) (Entered: 06/30/2016)
07/05/2016	50	ANSWER to Complaint , and COUNTERCLAIM filed by One World Technologies, Inc., Techtronic Industries North America, Inc., Ryobi Technologies, Inc., OWT Industries, Inc. against The Chamberlain Group, Inc. . by One World Technologies, Inc., Techtronic Industries North America, Inc., Ryobi Technologies, Inc., OWT Industries, Inc.(White, Jason) (Entered: 07/05/2016)
07/05/2016	51	NOTIFICATION of Affiliates pursuant to Local Rule 3.2 by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. (White, Jason) (Entered: 07/05/2016)
07/12/2016	52	MOTION by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc.To Add Techtronic Industries Co., Ltd As a Party to Plaintiff's Pending Motion for Preliminary Injunction (Vidal, Katherine) (Entered: 07/12/2016)
07/12/2016	53	NOTICE of Motion by Katherine Vidal for presentment of motion for miscellaneous relief 52 before Honorable Thomas M. Durkin on 7/19/2016 at 09:00 AM. (Vidal, Katherine) (Entered: 07/12/2016)
07/12/2016	54	MOTION by Defendant Techtronic Industries Co., Ltd. to dismiss for lack of jurisdiction (White, Jason) (Entered: 07/12/2016)
07/12/2016	55	MEMORANDUM by Techtronic Industries Co., Ltd. in support of motion to dismiss/lack of jurisdiction 54 (Attachments: # 1 Exhibit 1 - Declaration of Sean Dougherty)(White, Jason) (Entered: 07/12/2016)
07/12/2016	56	NOTICE of Motion by Jason C. White for presentment of motion to dismiss/lack of jurisdiction 54 before Honorable Thomas M. Durkin on 7/19/2016 at 09:00 AM. (White, Jason) (Entered: 07/12/2016)
07/13/2016	57	EXECUTIVE COMMITTEE ORDER: Case reassigned to the Honorable Harry D. Leinenweber for all further proceedings. Signed by Executive Committee on 07/13/2016. (jjr,) (Entered: 07/14/2016)
07/14/2016	58	MINUTE entry before the Honorable Thomas M. Durkin:The 7/19/2016 notice motion date before Judge Durkin is vacated as this action has been reassigned to Judge Leinenweber.Mailed notice (srn,) (Entered: 07/14/2016)
07/15/2016	59	MOTION by Plaintiff The Chamberlain Group, Inc. for reconsideration regarding assigning/reassigning Case 57 (Little, Nicole) (Entered: 07/15/2016)
07/15/2016	60	NOTICE of Motion by Nicole L. Little for presentment of motion for reconsideration, motion for relief 59 before Honorable Harry D. Leinenweber on 7/26/2016 at 09:30 AM. (Little, Nicole) (Entered: 07/15/2016)
07/18/2016	61	Amended NOTICE of Motion by Nicole L. Little for presentment of motion for miscellaneous relief 52 before Honorable Harry D. Leinenweber on 7/27/2016 at 09:30 AM. (Little, Nicole) (Entered: 07/18/2016)
07/19/2016	62	Amended NOTICE of Motion by Jason C. White for presentment of motion to dismiss/lack of jurisdiction 54 before Honorable Harry D. Leinenweber on 7/27/2016 at

		09:30 AM. (White, Jason) (Entered: 07/19/2016)
07/21/2016	63	Amended NOTICE of Motion by Nicole L. Little for presentment of motion for reconsideration, motion for relief 59 before Honorable Harry D. Leinenweber on 7/27/2016 at 09:30 AM. (Little, Nicole) (Entered: 07/21/2016)
07/25/2016	64	MINUTE entry before the Honorable Harry D. Leinenweber:All Motions currently scheduled to be heard on 7/26/2016 are reset by the court to be heard on 7/28/2016 at 9:30 a.m. Mailed notice (wp,) (Entered: 07/25/2016)
07/28/2016	65	MINUTE entry before the Honorable Harry D. Leinenweber:Motion hearing held on 7/28/2016. The Motion for reconsideration 59 is terminated as moot. Techtronic Industries Motion to Dismiss is continued to 8/29/2016 at 10:00 a.m. The Preliminary Injunction will be heard on 8/29/2016 at 10:00 a.m. Interim jurisdictional discovery is deferred until after the hearing. Mailed notice (wp,) (Entered: 07/28/2016)
08/01/2016	66	ANSWER to counterclaim by The Chamberlain Group, Inc.(Rueckheim, Michael) (Entered: 08/01/2016)
08/02/2016	67	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. to seal document (White, Jason) (Entered: 08/02/2016)
08/02/2016	68	NOTICE of Motion by Jason C. White for presentment of motion to seal document 67 before Honorable Harry D. Leinenweber on 8/4/2016 at 09:30 AM. (White, Jason) (Entered: 08/02/2016)
08/02/2016	69	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. for leave to file excess pages [UNOPPOSED] (White, Jason) (Entered: 08/02/2016)
08/02/2016	70	NOTICE of Motion by Jason C. White for presentment of motion for leave to file excess pages 69 before Honorable Harry D. Leinenweber on 8/4/2016 at 09:30 AM. (White, Jason) (Entered: 08/02/2016)
08/02/2016	71	RESPONSE by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc.in Opposition to MOTION by Plaintiff The Chamberlain Group, Inc. for preliminary injunction (Public Redacted Version) 8 - REDACTED (Attachments: # 1 Declaration of Nicholas Restauri, # 2 Declaration of Michael Farrah - REDACTED, # 3 Declaration of Michael Tate - REDACTED, # 4 Declaration of Vijay Madisetti - REDACTED, # 5 Exhibit A, # 6 Exhibit B, # 7 Exhibit C, # 8 Exhibit D, # 9 Exhibit E, # 10 Exhibit F, # 11 Exhibit G, # 12 Exhibit H, # 13 Exhibit I, # 14 Exhibit J, # 15 Exhibit K, # 16 Exhibit L, # 17 Exhibit M - REDACTED, # 18 Exhibit N - REDACTED, # 19 Exhibit O - REDACTED, # 20 Exhibit P - REDACTED, # 21 Exhibit Q - REDACTED, # 22 Exhibit R - REDACTED, # 23 Exhibit S - REDACTED, # 24 Exhibit T - REDACTED, # 25 Exhibit U - REDACTED, # 26 Exhibit V - REDACTED, # 27 Exhibit W, # 28 Exhibit X - REDACTED, # 29 Exhibit Y - REDACTED, # 30 Exhibit Z, # 31 Exhibit AA, # 32 Exhibit BB - REDACTED, # 33 Exhibit CC - REDACTED, # 34 Exhibit DD, # 35 Exhibit EE - REDACTED)(White, Jason) (Entered: 08/02/2016)
08/03/2016	72	SEALED REPLY by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. to MOTION by Plaintiff The Chamberlain Group, Inc. for preliminary injunction (Public Redacted Version) 8 (Attachments: # 1 Declaration of M. Farrah, # 2 Declaration of V. Madisetti, # 3 Declaration of M. Tate, # 4 Exhibit M, # 5 Exhibit N, # 6 Exhibit O, # 7 Exhibit P, # 8 Exhibit Q, # 9 Exhibit R, # 10 Exhibit S, # 11 Exhibit T, # 12 Exhibit U, # 13 Exhibit V, #

		14 Exhibit X, # 15 Exhibit Y, # 16 Exhibit BB, # 17 Exhibit CC, # 18 Exhibit EE)(White, Jason) (Entered: 08/03/2016)
08/03/2016	73	MINUTE entry before the Honorable Harry D. Leinenweber:Defendants' Motion for leave to file its opposition to motion for preliminary injunction: Exhibits M-V, X, Y, BB, CC, EE; and the declarations of Vijay Madisetti, Michael Tate, and Michael Farrah under seal 67 is granted, without objection. Defendants' Unopposed Motion for leave to file a brief in excess of fifteen pages in opposition to motion for preliminary injunction 69 is granted.Mailed notice (wp,) (Entered: 08/03/2016)
08/24/2016	74	REPLY by The Chamberlain Group, Inc. to SEALED MOTION by Plaintiff The Chamberlain Group, Inc. for Preliminary Injunction 14 (Redacted - Public) (Stiteler, Maria) (Entered: 08/24/2016)
08/24/2016	75	DECLARATION of John Fitzgerald regarding reply to response to motion 74 (Redacted - Public) (Attachments: # 1 Exhibit A - SEALED, # 2 Exhibit B - SEALED, # 3 Exhibit C - SEALED)(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	76	DECLARATION of V. Thomas Rhyne regarding reply to response to motion 74 (Redacted - Public) (Attachments: # 1 Exhibit A, # 2 Exhibit B - SEALED, # 3 Exhibit C - SEALED, # 4 Exhibit D - SEALED, # 5 Exhibit E - SEALED, # 6 Exhibit F, # 7 Exhibit G, # 8 Exhibit H, # 9 Exhibit I, # 10 Exhibit J, # 11 Exhibit K, # 12 Exhibit L, # 13 Exhibit M, # 14 Exhibit N)(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	77	DECLARATION of Cory Sorice regarding reply to response to motion 74 (Redacted - Public) (Attachments: # 1 Exhibit A, # 2 Exhibit B - SEALED, # 3 Exhibit C - SEALED, # 4 Exhibit D - SEALED, # 5 Exhibit E - SEALED, # 6 Exhibit F, # 7 Exhibit G, # 8 Exhibit H, # 9 Exhibit I, # 10 Exhibit J, # 11 Exhibit K, # 12 Exhibit L)(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	78	DECLARATION of Maria Elena Stiteler regarding reply to response to motion 74 (Redacted - Public) (Attachments: # 1 Exhibit A - SEALED, # 2 Exhibit B - SEALED, # 3 Exhibit C - SEALED, # 4 Exhibit D - SEALED, # 5 Exhibit E - SEALED, # 6 Exhibit F - SEALED, # 7 Exhibit G - SEALED, # 8 Exhibit H - SEALED, # 9 Exhibit I - SEALED, # 10 Exhibit J, # 11 Exhibit K, # 12 Exhibit L, # 13 Exhibit M - SEALED) (Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	79	DECLARATION of W. Christopher Bakewell regarding reply to response to motion 74 (Redacted - Public) (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D - SEALED, # 5 Exhibit E - SEALED, # 6 Exhibit F - SEALED, # 7 Exhibit G - SEALED, # 8 Exhibit H, # 9 Exhibit I - SEALED, # 10 Exhibit J - SEALED, # 11 Exhibit K, # 12 Exhibit L - SEALED, # 13 Exhibit M - SEALED, # 14 Exhibit N - SEALED, # 15 Exhibit O - SEALED, # 16 Exhibit P - SEALED, # 17 Exhibit Q, # 18 Exhibit R - SEALED, # 19 Exhibit S, # 20 Exhibit T, # 21 Exhibit U, # 22 Exhibit V - SEALED, # 23 Exhibit W - SEALED, # 24 Exhibit X, # 25 Exhibit Y, # 26 Exhibit Z, # 27 Exhibit AA - SEALED, # 28 Exhibit AB - SEALED, # 29 Exhibit AC - SEALED, # 30 Exhibit AD - SEALED, # 31 Exhibit AE - SEALED, # 32 Exhibit AF - SEALED, # 33 Exhibit AG - SEALED, # 34 Exhibit AH - SEALED, # 35 Exhibit AI, # 36 Exhibit AJ, # 37 Exhibit AK - SEALED, # 38 Exhibit AL - SEALED, # 39 Exhibit AM - SEALED, # 40 Exhibit AN - SEALED, # 41 Exhibit AO - SEALED, # 42 Exhibit AP - SEALED, # 43 Exhibit AQ - SEALED, # 44 Exhibit AR - SEALED, # 45 Exhibit AS - SEALED, # 46 Exhibit AT - SEALED, # 47 Exhibit AU - SEALED, # 48 Exhibit AV - SEALED, # 49 Exhibit AW - SEALED, # 50 Exhibit AX - SEALED, # 51 Exhibit AY - SEALED, # 52 Exhibit AZ - SEALED, # 53 Exhibit BA - SEALED, # 54 Exhibit BB - SEALED, # 55 Exhibit BC - SEALED, # 56 Exhibit BD - SEALED, # 57 Exhibit BE - SEALED, # 58 Exhibit BF - SEALED, # 59 Exhibit BG - SEALED, # 60 Exhibit BH - SEALED, # 61 Exhibit BI)(Stiteler, Maria) (Entered: 08/25/2016)

08/25/2016	80	SEALED REPLY by The Chamberlain Group, Inc. to SEALED MOTION by Plaintiff The Chamberlain Group, Inc. for Preliminary Injunction 14 (Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	81	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of John Fitzgerald in Support of Plaintiff's Reply in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit A (Sealed), # 2 Exhibit B (Sealed), # 3 Exhibit C (Sealed))(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	82	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of V. Thomas Rhyne in Support of Plaintiff's Reply in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit B (Sealed), # 2 Exhibit C (Sealed), # 3 Exhibit D (Sealed), # 4 Exhibit E (Sealed))(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	83	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of Cory Sorice in Support of Plaintiff's Reply in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit B (Sealed), # 2 Exhibit C (Sealed), # 3 Exhibit D (Sealed), # 4 Exhibit E (Sealed))(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	84	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. - Declaration of Maria Elena Stiteler in Support of Plaintiff's Reply in Support of its Motion for Preliminary Injunction (Attachments: # 1 Exhibit A (Sealed), # 2 Exhibit B (Sealed), # 3 Exhibit C (Sealed), # 4 Exhibit D (Sealed), # 5 Exhibit E (Sealed), # 6 Exhibit F (Sealed), # 7 Exhibit G (Sealed), # 8 Exhibit H (Sealed), # 9 Exhibit I (Sealed), # 10 Exhibit M (Sealed))(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	85	SEALED DOCUMENT by Plaintiff The Chamberlain Group, Inc. Rebuttal Declaration of W. Christopher Bakewell In Support Of Chamberlain's Request For A Preliminary Injunction (Attachments: # 1 Exhibit AA (Sealed), # 2 Exhibit AB (Sealed), # 3 Exhibit AD (Sealed), # 4 Exhibit AE (Sealed), # 5 Exhibit AF (Sealed), # 6 Exhibit AG (Sealed), # 7 Exhibit AH (Sealed), # 8 Exhibit AK (Sealed), # 9 Exhibit AL (Sealed), # 10 Exhibit AM (Sealed), # 11 Exhibit AN (Sealed), # 12 Exhibit AO (Sealed), # 13 Exhibit AP (Sealed), # 14 Exhibit AQ (Sealed), # 15 Exhibit AR (Sealed), # 16 Exhibit AS (Sealed), # 17 Exhibit AT (Sealed), # 18 Exhibit AU (Sealed), # 19 Exhibit AV (Sealed), # 20 Exhibit AW (Sealed), # 21 Exhibit AX (Sealed), # 22 Exhibit AY (Sealed), # 23 Exhibit AZ (Sealed), # 24 Exhibit BA (Sealed), # 25 Exhibit BB (Sealed), # 26 Exhibit BC (Sealed), # 27 Exhibit BD (Sealed), # 28 Exhibit BE (Sealed), # 29 Exhibit BF (Sealed), # 30 Exhibit BG (Sealed), # 31 Exhibit BH (Sealed), # 32 Exhibit D (Sealed), # 33 Exhibit E (Sealed), # 34 Exhibit F (Sealed), # 35 Exhibit G (Sealed), # 36 Exhibit I (Sealed), # 37 Exhibit J (Sealed), # 38 Exhibit L (Sealed), # 39 Exhibit M (Sealed), # 40 Exhibit N (Sealed), # 41 Exhibit O (Sealed), # 42 Exhibit P (Sealed), # 43 Exhibit R (Sealed), # 44 Exhibit V (Sealed), # 45 Exhibit W (Sealed), # 46 Exhibit Z (Sealed))(Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	86	MOTION by Plaintiff The Chamberlain Group, Inc. to seal document sealed document, 84 , sealed document, 83 , sealed document, 82 , sealed document, 81 , reply 80 , sealed document,,,,, 85 (Plaintiff's Unopposed Motion to File Its Reply in Support of its Motion for Preliminary Injunction and Supporting Documents under Seal) (Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	87	NOTICE of Motion by Maria Elena Stiteler for presentment of motion to seal document, motion for relief,,,,,,,,,,, 86 before Honorable Harry D. Leinenweber on 8/30/2016 at 09:30 AM. (Stiteler, Maria) (Entered: 08/25/2016)
08/25/2016	88	TRANSCRIPT OF PROCEEDINGS held on 07/28/2016 before the Honorable Harry D. Leinenweber. Court Reporter Contact Information: Judith A. Walsh, CSR, RDR, F/CRR.

		judith_walsh@ilnd.uscourts.gov. <P>IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings.</P> Redaction Request due 9/15/2016. Redacted Transcript Deadline set for 9/26/2016. Release of Transcript Restriction set for 11/23/2016. (Walsh, Judy) (Entered: 08/25/2016)
08/26/2016	89	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. to strike Portions of Plaintiff's Reply in Support of Motion for Preliminary Injunction and Motion in Limine to Exclude Testimony from Cory Sorice - EMERGENCY (White, Jason) (Entered: 08/26/2016)
08/26/2016	90	NOTICE of Motion by Jason C. White for presentment of motion to strike, 89 before Honorable Harry D. Leinenweber on 8/30/2016 at 09:30 AM. (White, Jason) (Entered: 08/26/2016)
08/28/2016	91	Notice of Corrected Exhibit by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. (Attachments: # 1 Exhibit L to Defendants' Opposition to Motion for Preliminary Injunction)(White, Jason) (Entered: 08/28/2016)
08/29/2016	92	MINUTE entry before the Honorable Harry D. Leinenweber:Preliminary Injunction hearing held on 8/29/2016. Preliminary Injunction hearing set for 8/30/2016 at 10:00 AM.Mailed notice (wp,) (Entered: 09/01/2016)
08/30/2016	93	MINUTE entry before the Honorable Harry D. Leinenweber:Preliminary Injunction hearing held on 8/30/2016. Preliminary Injunction hearing set for 8/31/2016 at 10:00 AM.Mailed notice (wp,) (Entered: 09/01/2016)
08/31/2016	94	MINUTE entry before the Honorable Harry D. Leinenweber:Preliminary Injunction hearing held on 8/31/2016Mailed notice (wp,) (Entered: 09/01/2016)
08/31/2016	95	MINUTE entry before the Honorable Harry D. Leinenweber: Jury Trial set for 2/6/2017 at 10:00 AM. Mailed notice (wp,) (Entered: 09/01/2016)
09/06/2016	96	MOTION by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc. to seal Joint Motion to Seal Portions or Preliminary Inunction Hearing Transcript (Stiteler, Maria) (Entered: 09/06/2016)
09/06/2016	97	Joint NOTICE of Motion by Maria Elena Stiteler for presentment of motion to seal 96 before Honorable Harry D. Leinenweber on 9/13/2016 at 09:30 AM. (Stiteler, Maria) (Entered: 09/06/2016)
09/13/2016	98	MINUTE entry before the Honorable Harry D. Leinenweber:Motion hearing held and continued to 9/15/2016 at 09:00 AM regarding plaintiff's motion to seal 96 .Mailed notice (jms,) (Entered: 09/13/2016)
09/15/2016	99	MINUTE entry before the Honorable Harry D. Leinenweber:Pursuant to Memorandum Opinion and Order entered this day, plaintiff's motion for preliminary injunction 8 is granted.Mailed notice (jms,) (Entered: 09/15/2016)
09/15/2016	100	MINUTE entry before the Honorable Harry D. Leinenweber: Motion hearing held. Plaintiff's joint motion to seal portions of preliminary inunction hearing Transcript 96 is granted. Bond is set at $7,500,000.00. The parties are directed to submit an agreed preliminary injunction and bond order forthwith. Defendant's oral motion to stay the issuance of the preliminary injunction is denied for the reasons stated in open court.

		Status hearing is set for 9/20/2016 at 09:00 AM.Mailed notice (jms,) (Entered: 09/15/2016)
09/15/2016	101	SEALED TRANSCRIPT OF PROCEEDINGS held on 08/29/2016 before the Honorable Harry D. Leinenweber. SEALED Vol. 1 Preliminary Injunction Hearing. Court Reporter Contact Information: Judith A. Walsh, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. (Walsh, Judy) (Entered: 09/15/2016)
09/15/2016	102	SEALED TRANSCRIPT OF PROCEEDINGS held on 08/30/2016 before the Honorable Harry D. Leinenweber. SEALED Vol. 2 Preliminary Injunction Hearing. Court Reporter Contact Information: Judith A. Walsh, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. (Walsh, Judy) (Entered: 09/15/2016)
09/15/2016	103	SEALED TRANSCRIPT OF PROCEEDINGS held on 08/31/2016 before the Honorable Harry D. Leinenweber. SEALED Vol. 3 Preliminary Injunction Hearing. Court Reporter Contact Information: Judith A. Walsh, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. (Walsh, Judy) (Entered: 09/15/2016)
09/15/2016	104	SEALED MEMORANDUM OPINION AND ORDER GRANTING PRELIMINARY INJUNCTION. Mailed notice (aee,) (Entered: 09/16/2016)
09/15/2016	107	REDACTED MEMORANDUM Opinion and Order: Signed by the Honorable Harry D. Leinenweber on 9/15/2016. Mailed notice (aee,) (Main Document 107 replaced on 9/22/2016) (jms,). (Entered: 09/22/2016)
09/20/2016	105	MINUTE entry before the Honorable Harry D. Leinenweber:Status hearing held and continued to 9/27/2016 at 09:00 AM. The parties are given to 9/23/2016 to submit their joint proposal. The parties are given to 9/27/2016 to file their position briefs on the issues of direct/indirect and Home Depot as outlined in open court.Mailed notice (jms,) (Entered: 09/20/2016)
09/20/2016	111	PRELIMINARY INJUNCTION ORDER Signed by the Honorable Harry D. Leinenweber on 9/20/2016:Mailed notice(wp,) (Entered: 09/27/2016)
09/21/2016	106	TRANSCRIPT OF PROCEEDINGS held on 09/20/2016 before the Honorable Harry D. Leinenweber. Court Reporter Contact Information: Judith A. Walsh, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings. Redaction Request due 10/12/2016. Redacted Transcript Deadline set for 10/24/2016. Release of Transcript Restriction set for 12/20/2016. (Walsh, Judy) (Linked document has the incorrect case number.) Modified on 9/28/2016 (aee,). (Entered: 09/21/2016)
09/23/2016	108	MOTION by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc. for protective order Joint Motion (Attachments: # 1 Text of Proposed Order Protective Order)(Rueckheim, Michael) (Entered: 09/23/2016)
09/23/2016	109	MOTION by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc.Scheduling Order and Discovery Order Joint Motion (Attachments: # 1 Text of Proposed Order Scheduling Order and Discovery Order)(Rueckheim, Michael) (Entered: 09/23/2016)

09/23/2016	110	JOINT NOTICE of Motion by Michael R. Rueckheim for presentment of motion for miscellaneous relief, 109 , motion for protective order 108 before Honorable Harry D. Leinenweber on 9/27/2016 at 09:00 AM. (Rueckheim, Michael) (Entered: 09/23/2016)
09/27/2016	112	TRANSCRIPT OF PROCEEDINGS held on 09/15/2016 before the Honorable Harry D. Leinenweber. Court Reporter Contact Information: Judith A. Walsh, Official Court Reporter, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. <P>IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings.</P> Redaction Request due 10/18/2016. Redacted Transcript Deadline set for 10/28/2016. Release of Transcript Restriction set for 12/27/2016. (Walsh, Judy) (Entered: 09/27/2016)
09/27/2016	113	NOTICE of appeal by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. regarding orders 111 Filing fee $ 505, receipt number 0752-12405796. (White, Jason) (Entered: 09/27/2016)
09/27/2016	114	TRANSMITTED to the United States Court of Appeal for the Federal Circuit the short record on notice of appeal 113 . Notified counsel (ek,) (Entered: 09/27/2016)
09/27/2016	115	MEMORANDUM by OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. in Support of Their Argument That The Home Depot Should Not Be Enjoined (Attachments: # 1 Exhibit A)(White, Jason) (Entered: 09/27/2016)
09/27/2016	116	BRIEF by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc. in support of its proposed amendments to the preliminary injunction order (Attachments: # 1 Exhibit A-Proposed Order, # 2 Exhibit B-Filed Under Seal, # 3 Exhibit C-Filed Under Seal, # 4 Exhibit D)(Rueckheim, Michael) Modified by the clerk's office on 9/28/2016 (jl,). (Entered: 09/27/2016)
09/27/2016	117	SEALED DOCUMENT (116 sealed version) by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc. (Attachments: # 1 Exhibit B, # 2 Exhibit C)(Stiteler, Maria) Modified by the clerk's office on 9/28/2016 (jl,). Modified on 9/28/2016 (jl,). Modified on 9/28/2016 (jl,). (Entered: 09/27/2016)
09/27/2016	118	MOTION by Counter Defendant The Chamberlain Group, Inc., Plaintiff The Chamberlain Group, Inc. to seal Plaintiff's Brief ISO of its Proposed Amendments to the Preliminary Injunction Motion (Rueckheim, Michael) (Entered: 09/27/2016)
09/27/2016	119	NOTICE of Motion by Michael R. Rueckheim for presentment of motion to seal 118 before Honorable Harry D. Leinenweber on 10/4/2016 at 09:30 AM. (Rueckheim, Michael) (Entered: 09/27/2016)
09/27/2016	127	MINUTE entry before the Honorable Harry D. Leinenweber:Status hearing held on 9/27/2016Mailed notice (wp,) (Entered: 09/30/2016)
09/28/2016	122	ORDER dated 09/28/2016 from the 7th Circuit regarding notice of appeal 113 ; Appellate case no. : 16-2713. IT IS ORDERED THAT: Appellee is directed to respond to the motion for a stay and motion to expedite no later than seven days from the date of filing of this order. Any reply is due within three days of the date of filing of the response. Appellants are directed to file their opening brief no later than October 11, 2016. (aee,) (Entered: 09/29/2016)
09/28/2016	124	ACKNOWLEDGMENT of receipt of short record on appeal regarding notice of appeal

		113 ; USCA Case No. 16-2713 (aee,) (Entered: 09/29/2016)
09/29/2016	120	TRANSCRIPT OF PROCEEDINGS held on 08/29/2016 through 08/31/2016 before the Honorable Harry D. Leinenweber. REDACTED Preliminary Injunction Hearing. Court Reporter Contact Information: Judith A. Walsh, Official Court Reporter, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. <P>IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings.</P> Redaction Request due 10/20/2016. Redacted Transcript Deadline set for 10/31/2016. Release of Transcript Restriction set for 12/28/2016. (Walsh, Judy) (Entered: 09/29/2016)
09/29/2016	121	TRANSCRIPT OF PROCEEDINGS held on 09/20/2016 before the Honorable Harry D. Leinenweber. CORRECTED CASE NUMBER. Court Reporter Contact Information: Judith A. Walsh, Official Court Reporter, CSR, RDR, F/CRR. judith_walsh@ilnd.uscourts.gov. <P>IMPORTANT: The transcript may be viewed at the court's public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through the Court Reporter/Transcriber or PACER. For further information on the redaction process, see the Court's web site at www.ilnd.uscourts.gov under Quick Links select Policy Regarding the Availability of Transcripts of Court Proceedings.</P> Redaction Request due 10/20/2016. Redacted Transcript Deadline set for 10/31/2016. Release of Transcript Restriction set for 12/28/2016. (Walsh, Judy) (Entered: 09/29/2016)
09/29/2016	123	MINUTE entry before the Honorable Harry D. Leinenweber:Plaintiff's Motion to seal it's brief in support of its proposed amendments to the preliminary injunction 118 is granted, without objection.Mailed notice (wp,) (Entered: 09/29/2016)
09/29/2016	125	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc.to Limit the Number of Asserted Claims (Attachments: # 1 Declaration of Jason White, # 2 Exhibit A, # 3 Exhibit B, # 4 Exhibit C)(White, Jason) (Entered: 09/29/2016)
09/29/2016	126	NOTICE of Motion by Jason C. White for presentment of motion for miscellaneous relief, 125 before Honorable Harry D. Leinenweber on 10/4/2016 at 09:30 AM. (White, Jason) (Entered: 09/29/2016)
10/03/2016	128	Notice of Recent Events by The Chamberlain Group, Inc. in Support of Plaintiff's Proposed Amendments to the Preliminary Injunction Order (Attachments: # 1 Declaration Rueckheim Declaration, # 2 Exhibit A, # 3 Exhibit B, # 4 Exhibit C, # 5 Exhibit D)(Rueckheim, Michael) (Entered: 10/03/2016)
10/04/2016	129	Motion hearing held on 10/4/2016. The Court grants in part and denies in part the parties Motion for Protective Order [ECF No. 108] and Motion for a Scheduling Order [ECF No. 109]. The parties are directed to submit amended joint orders that reflect the Courts rulings on these matters. Additionally, the parties should submit an amended preliminary injunction order that reflects the Courts finding regarding indirect infringement. Signed by the Honorable Harry D. Leinenweber on 10/4/2016:Defendants' Motion to Limit the number of asserted claims 125 is held in abeyance Mailed notice(wp,) (Entered: 10/04/2016)
10/05/2016	130	MOTION by Defendants OWT Industries, Inc., One World Technologies, Inc., Ryobi Technologies, Inc., Techtronic Industries North America, Inc. for reconsideration regarding memorandum opinion and order 107 (White, Jason) (Entered: 10/05/2016)

10/05/2016	131	NOTICE of Motion by Jason C. White for presentment of motion for reconsideration, motion for relief 130 before Honorable Harry D. Leinenweber on 10/12/2016 at 09:30 AM. (White, Jason) (Entered: 10/05/2016)

PACER Service Center			
Transaction Receipt			
10/09/2016 12:17:05			
PACER Login:	mlchpacer:2837051:4856219	Client Code:	
Description:	Docket Report	Search Criteria:	1:16-cv-06097
Billable Pages:	20	Cost:	2.00

US007224275B2

(12) **United States Patent**
Fitzgibbon

(10) **Patent No.: US 7,224,275 B2**
(45) **Date of Patent: May 29, 2007**

(54) **MOVABLE BARRIER OPERATORS STATUS CONDITION TRANSCEPTION APPARATUS AND METHOD**

(75) Inventor: **James J. Fitzgibbon**, Batavia, IL (US)

(73) Assignee: **The Chamberlain Group, Inc.**, Elmhurst, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 162 days.

(21) Appl. No.: **10/447,663**

(22) Filed: **May 29, 2003**

(65) **Prior Publication Data**

US 2004/0239496 A1 Dec. 2, 2004

(51) **Int. Cl.**
G08B 1/08 (2006.01)
G08C 19/00 (2006.01)
E05F 15/20 (2006.01)

(52) **U.S. Cl.** **340/539.26**; 340/545.1; 340/539.1; 340/825.69; 340/825.72; 340/686.1; 49/25; 49/31

(58) **Field of Classification Search** 340/825.69, 340/825.72, 539.26; 49/25, 31
See application file for complete search history.

(56) **References Cited**

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British Search Report for British patent application GB0412067.1 dated Oct. 4, 2004.

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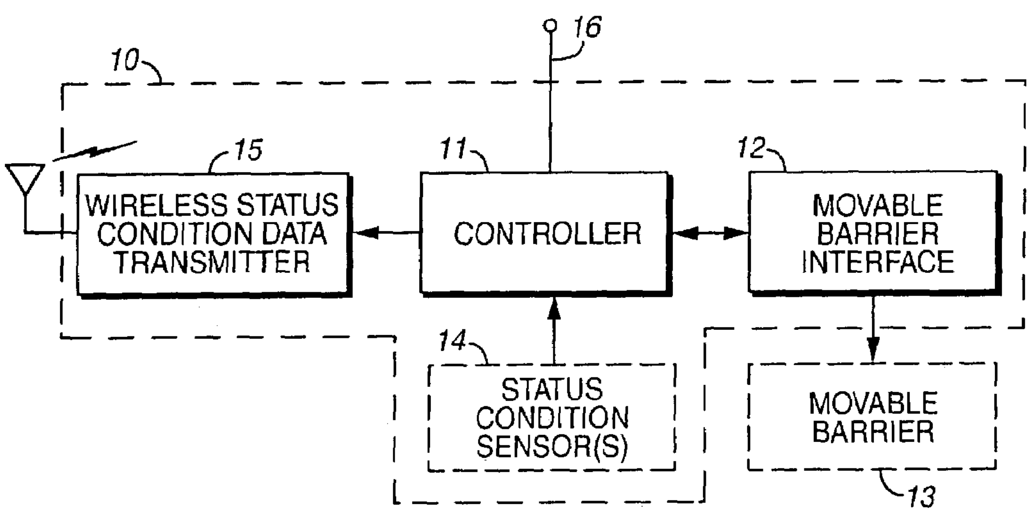
Primary Examiner—Donnie L. Crosland
(74) *Attorney, Agent, or Firm*—Fitch, Even, Tabin & Flannery

(57) **ABSTRACT**

A movable barrier operator (**10**) has a wireless status condition data transmitter (**15**) that wirelessly transmits status condition messages to one or more remote peripherals (**20**). The latter can in turn use this status information to effect their own functionality and supported features.

31 Claims, 2 Drawing Sheets



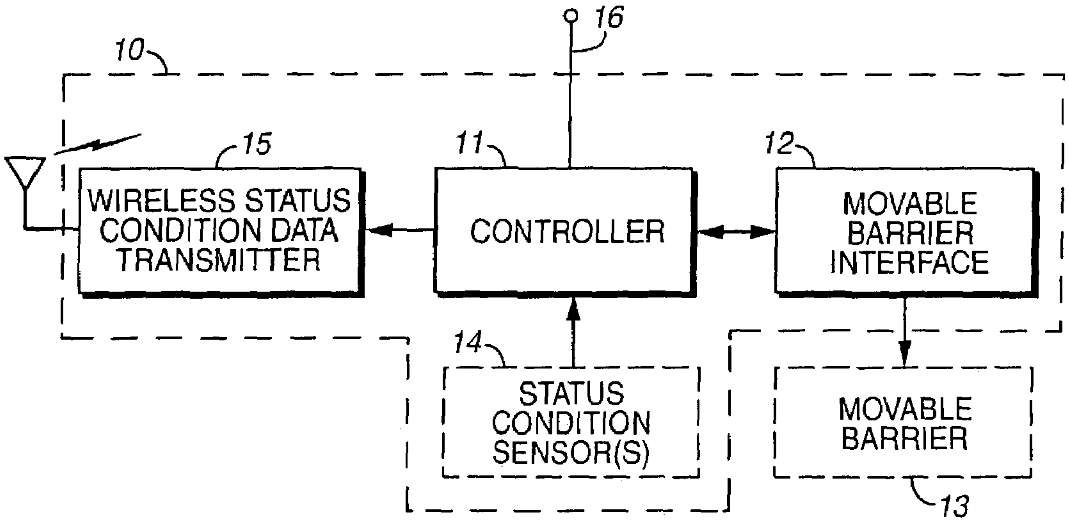


FIG. 1

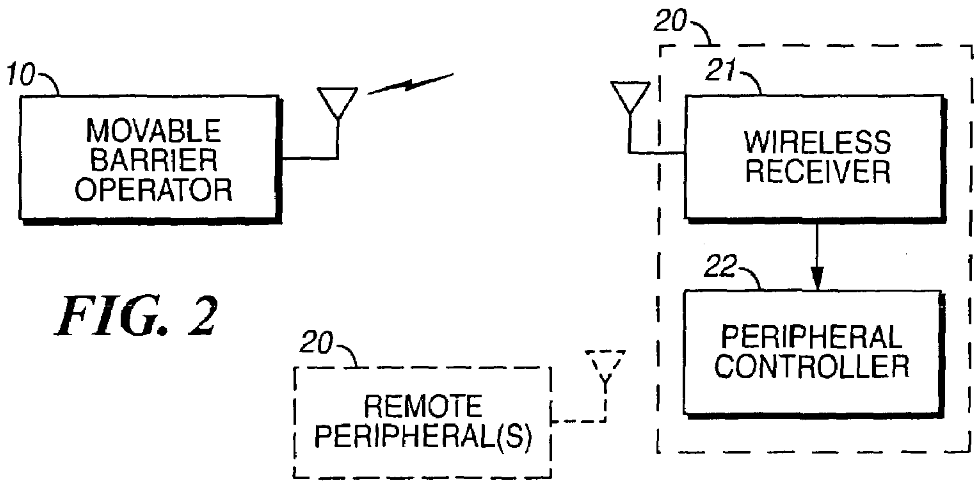


FIG. 2

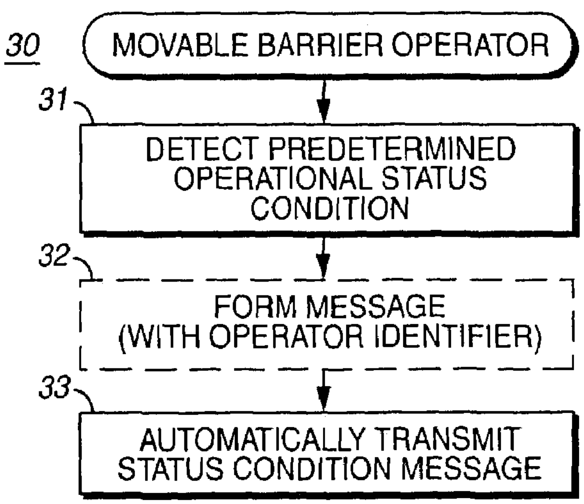


FIG. 3

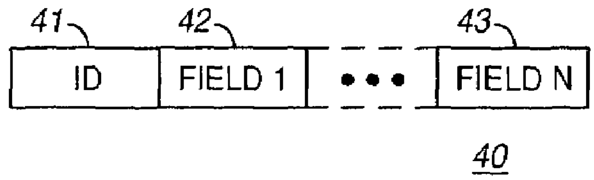


FIG. 4

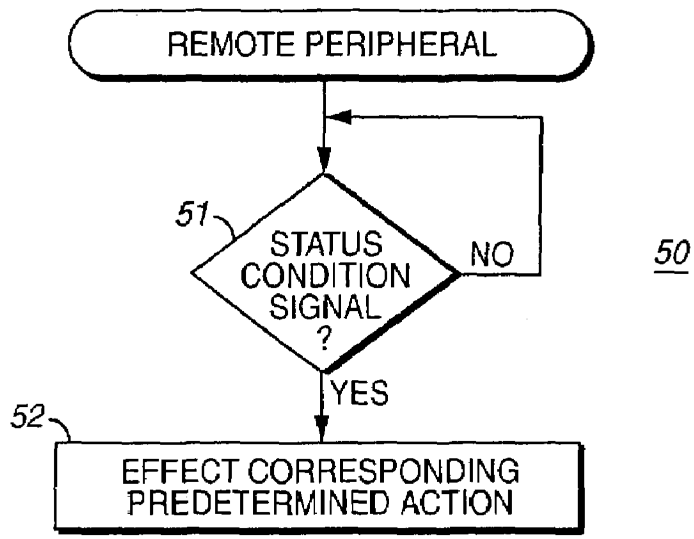


FIG. 5

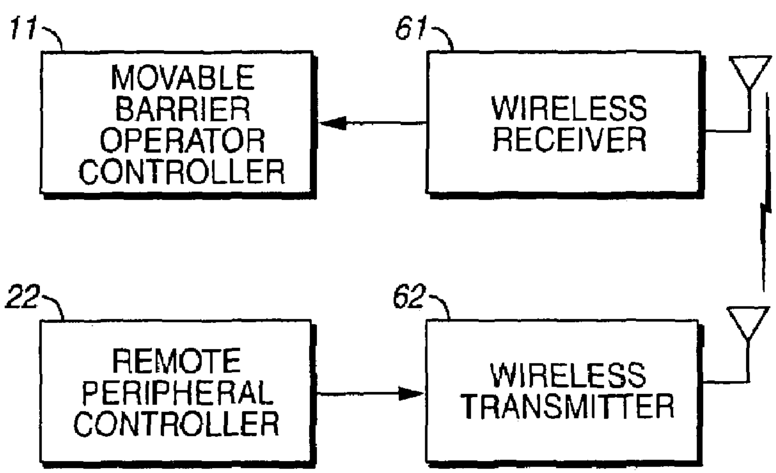


FIG. 6

MOVABLE BARRIER OPERATORS STATUS CONDITION TRANSCEPTION APPARATUS AND METHOD

TECHNICAL FIELD

This invention relates generally to movable barrier operators.

BACKGROUND

Movable barriers of various kinds are known in the art, including but not limited to horizontally and vertically sliding barriers, vertically and horizontally pivoting barriers, single-piece barriers, multi-piece or segmented barriers, partial barriers, complete barriers, rolling shutters, and various combinations and permutations of the above. Such barriers are typically used to control physical and/or visual access to or via an entryway (or exit) such as, for example, a doorway to a building or an entry point for a garage.

In many cases, a motor or other motion-imparting mechanism is utilized to effect selective movement of such a movable barrier. A movable barrier operator will then usually be utilized to permit control of the motion-imparting mechanism. In some cases a user may control the movable barrier operator by indicating a selection via one or more control surfaces that are physically associated with the movable barrier operator. In other cases such control can be effected by the transmission of a wireless remote control signal to the movable barrier operator.

Over time, the capabilities of and features supported by such movable barrier operators has expanded to include actions other than merely opening and closing a corresponding movable barrier. Some movable barrier operators provide ambient lighting. Some movable barrier operators can sense the likely presence of an obstacle in the path of the movable barrier and take an appropriate corresponding action. And some movable barriers have a plurality of operating modes to facilitate differing control strategies (for example, many movable barrier operators have a so-called vacation mode that prompts use of a differing set of operational states when the user leaves the movable barrier operator for an extended period of time or a learning mode that places the movable barrier operator into a programmable state to permit manual and/or automatic setting or selection of one or more operational parameters such as a maximum force setting).

Installation settings and needs can vary considerably from one place to another. Notwithstanding this truism, movable barrier operator manufacturers prefer to seek the economies of scale that attend the manufacture and distribution of movable barrier operator platforms that will provide satisfactory service in a wide variety of settings. As a result, some movable barrier operators are manufactured with the ability to support a wide range of functionality. Unfortunately, this often means that a physical interface must be provided to support numerous potentially utilized peripheral devices (including but not limited to sensors, control surfaces, alarms, displays, ambient and/or spot lighting, and so forth). This physical interface can represent undesired additional cost when part of the interface goes unused in a given installation.

Furthermore, even when a given installation includes use of all potentially supported peripherals, the physical installation itself will often necessarily include a physical signaling path to couple the movable barrier operator to the

various peripherals. This in turn can result in undesired exposed wiring and/or an undesired increase of installation time.

It is also likely in some installation settings that the physical interface of a given movable barrier operator, regardless of how well conceived in the first instance, may nevertheless fail to permit compatible support of a given peripheral. For example, a given user may wish to provide a quantity of individual lighting platforms that exceeds the number of lights that are supported by the physical interface for a given movable barrier operator. As another example, another given user may wish to support a relatively new function, such as an alarm that sounds when a possibly unauthorized individual enters an opened entryway, that is not specifically supported by a given movable barrier operator.

For these and other reasons, prior art movable barrier operators are often partially or wholly inadequate to suit the present and/or developing needs of a given application.

BRIEF DESCRIPTION OF THE DRAWINGS

The above needs are at least partially met through provision of the movable barrier operator status condition transmission apparatus and method described in the following detailed description, particularly when studied in conjunction with the drawings, wherein:

FIG. **1** comprises a block diagram as configured in accordance with various embodiments of the invention;

FIG. **2** comprises another block diagram as configured in accordance with various embodiments of the invention;

FIG. **3** comprises a flow diagram as configured in accordance with an embodiment of the invention;

FIG. **4** comprises a schematic view of a message packet as configured in accordance with various embodiments of the invention;

FIG. **5** comprises a flow diagram as configured in accordance with an embodiment of the invention; and

FIG. **6** comprises a block diagram as configured in accordance with an alternative embodiment of the invention.

Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of various embodiments of the present invention. Also, common but well-understood elements that are useful or necessary in a commercially feasible embodiment are typically not depicted in order to facilitate a less obstructed view of these various embodiments of the present invention.

DETAILED DESCRIPTION

Generally speaking, pursuant to these various embodiments, a movable barrier operator has a controller having a plurality of potential operational status conditions, a movable barrier interface that operably couples to the controller, and a wireless status condition data transmitter that is operably coupled to the controller as well. If desired, one or more status condition sensors can be utilized to sense one or more predetermined conditions and to provide corresponding indicia to the controller. In a preferred embodiment, the wireless status condition data transmitter transmits a status condition signal that corresponds to at least one of the potential operational status conditions. If desired, the status condition signal can be combined with an identifier that correlates (uniquely or relatively uniquely) to the controller and/or the movable barrier operator. Such an identifier can serve to permit a receiving device to process as appropriate the status condition information.

Such status condition information can be received and processed, in a preferred embodiment, by a remote peripheral device (such as, but not limited to, a display, an alarm, a lighting control unit, and so forth). If desired, although the status condition information does not comprise a control signal as such (meaning that the status condition information does not comprise an instructional signal but rather presents only informational content), the remote peripheral can be configured to process the data content to thereby nevertheless effect a desired corresponding action.

So configured, a given movable barrier operator can be set to wirelessly transmit a wide variety of simple messages regarding its operational states. Such information can then be utilized to compatibly support a wide range of presently desired and later-developed features and functionality. If desired, the overall cost of a given platform can be reduced as the need to over-design a physical peripheral interface becomes diminished. Furthermore, such a platform has an improved opportunity to remain compatible with evolving features and legal and/or regulatory requirements to thereby promote a longer useful service life.

Referring now to the drawings, and in particular to FIG. **1**, in a preferred embodiment a movable barrier operator **10** will include a controller **11**, a movable barrier interface **12**, and a wireless status condition data transmitter **15**. The controller **11** will preferably comprise a programmable platform (such as, for example, a microprocessor, a microcontroller, a programmable logic or gate array, or the like) that can be readily programmed and configured in accordance with the various teachings set forth herein and as is generally well understood in the art. The movable barrier interface **12** couples to and is controlled by the controller **11** and further couples to a movable barrier **13**. Various mechanisms now known or hereafter developed can serve as the movable barrier interface **12** including various drive mechanisms, clutch arrangements, and so forth. In general, the movable barrier interface **12** serves to selectively impart motion to the movable barrier **13** to cause the movable barrier **13** to move to a desired position (such as, for example, a fully opened or a fully closed position) and/or to restrict or prohibit such motion (as when movement of the movable barrier may be the result of gravity and the movable barrier interface **12** serves in part to prevent such movement until such movement is desired). Such controllers **11** and movable barrier interfaces **12** are well understood in the art, and therefore, for the sake of brevity and the preservation of focus, additional explanatory detail regarding such mechanisms will not be provided here.

The wireless status condition data transmitter **15** operably couples to an output of the controller **11**. This transmitter **15** can be of any variety as may suit the needs of a given application. For example, the transmitter **15** can comprise a radio frequency carrier-based transmitter, an infrared carrier-based transmitter, or a sonic carrier-based transmitter (all being generally well understood in the art). In a similar fashion, the transmission power, modulation type, signaling protocol, and other attendant characterizing features and practices of the wireless transmitter **15** can again be as desired to suit the needs of a particular setting. In a preferred embodiment, this transmitter **15** will comprise a relatively low power transmitter such that the signals it broadcasts are only receivable within a relatively constrained area (such as, for example, an effective range of 100 meters, 500 meters, 1,000 meters, or the like). Again, such transmitters are well understood in the art and hence further elaboration here will not be provided.

In a typical embodiment, the controller **11** will have a plurality of potential operational status conditions. For example, the controller **11** might have two or more of the following potential operational status conditions:

- moving the movable barrier in a first direction (such as towards a closed position);
- moving the movable barrier in a second direction (such as towards an opened position);
- reversing movement of the movable barrier (for example, to alter movement from a closed position and towards an open position);
- halting movement of the movable barrier;
- detecting a likely presence of an obstacle (such as a person or pet) in the likely path of movement of the movable barrier;
- detecting a likely proximal presence of a human (such as a person in the vicinity of the controller);
- detecting a likely proximal presence of a compatible transmitter (such as a corresponding remote control transmitter for the movable barrier operator);
- receiving a wireless remote control signal (as sourced, for example, by a handheld remote control device);
- receiving a wireline remote control signal (as sourced, for example, by a wall mounted remote control device);
- receiving a learning mode initiation signal (via, for example, a switch provided for this purpose on the movable barrier operator housing);
- a lighting status change (as when, for example, the controller switches ambient lighting in a garage to an off condition a predetermined period of time following closure of the movable barrier);
- a vacation mode status change (as when a user effects this change via a switch provided for this purpose);
- detecting a likely proximal presence of a vehicle;
- detecting the identification of a proximal vehicle (as when, for example, the vehicle or some corresponding agent device transmits an identifying signal); and
- receiving an operating parameter alteration signal (via, for example, an integral or remote switch or other user interface).

It will be understood and appreciated that these are intended for illustrative purposes only, and that a given controller may have only a subset of these status conditions, a combination of some or all of these status conditions with other status conditions, or a set of wholly different potential status conditions.

Depending upon the needs of the setting, the controller **11** can be self-aware of such operational status conditions (as when, for example, the controller **11** is aware that it has switched a given ambient light fixture on or off) or the controller **11** can be provided with externally developed information regarding the condition. To effect the latter, it may be desirable in some settings to use one or more status condition sensors **14**. Such sensors **14** can be disposed integral to the movable barrier operator **10** as suggested by the illustration in FIG. **1** and/or can be configured as remotely disposed entities to suit the requirements of a specific application.

Pursuant to these various embodiments, the wireless status condition data transmitter **15** serves to transmit a status condition signal that represents a present operational status condition of the controller **11**. In a preferred embodiment, this transmission occurs automatically in response to when the controller **11** detects at least one predetermined condition, which predetermined condition preferably, but not necessarily, corresponds to the present operational status being reported via the transmission. Another option would be to have such information transmitted on a substantially regular periodic basis. An illustrative (but not all-inclusive) listing of potentially useful predetermined conditions might include:

moving the movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;
receiving an operating parameter alteration signal;
expiration of a predetermined duration of time; and
attainment of a predetermined point in time.

In a preferred approach, this status condition signal does not constitute a control signal per se. That is to say, the controller **11** does not necessarily source this status condition signal as a specific part of implementing a control strategy. As an example, the controller **11** would not source this status condition signal to specifically cause a light to be switched on upon receipt of the signal. Instead, the controller **11** sources this status condition signal to specify that it has, through some other means, initiated a control action or strategy to cause a light to be switched on. The status condition signal then simply reflects the actions being taken by the controller **11** and/or the other operational conditions being experienced by the controller **11**.

If desired, such status condition data signals can also be transmitted by the controller **11** via a wireline connection **16**.

Referring now to FIG. **2**, the status condition signals as transmitted from such a movable barrier operator **10** are preferably received by a remote peripheral **20** having a corresponding compatible wireless receiver **21** that operably couples to a peripheral controller **22**. The remote peripheral **20** itself can comprise any of a wide variety of platforms, including but certainly not limited to an informational display, a remote access interface, a light fixture, a timer apparatus, an alarm unit, and so forth. So configured, the remote peripheral **20**, upon receiving status condition information from the movable barrier operator **10** via the wireless transmissions being sourced by the latter, can process that information in accord with a desired end result. For example, the remote peripheral **20** can serve to simply further communicate such status information via a display such as an alphanumeric display, a graphic images display, one or more signal lights and/or corresponding indicative audible sounds, and so forth.

As another example, the remote peripheral **20** can process such status information to then itself ascertain a particular resultant course of activity. To illustrate, the remote peripheral can comprise a peripheral lighting unit that controls the provision of ambient lighting in a particular area (such as in a yard area outside the entrance to a residential garage). Upon receiving a status condition signal from the movable barrier operator **10** indicating that the movable barrier operator **10** has switched on its own lights, the remote peripheral **20** can then itself determine to also switch on its own lights. In a similar fashion, upon being informed that the movable barrier operator **10** has switched its lights off, the remote peripheral **20** can also decide to switch its own lights to an off condition.

So configured, it can be seen that when a movable barrier operator **11** provides wireless signals that represent one or more status conditions, a wide variety of known and hereafter developed remote peripherals **20** can be readily configured to leverage the receipt of such information for a variety of other purposes. Such remote peripherals can further supplement or extend the functionality of the movable barrier operator **10** itself (as when the remote peripheral **20** simply activates additional lighting to complement the lighting strategy of the movable barrier operator **10**) or they can facilitate functionality that is above and beyond the control architecture of the movable barrier operator **10**. To support the latter, it is preferred that the movable barrier operator **10** tend towards a relatively rich data stream where at least many or even substantially all current operational status conditions are regularly noted and transmitted to thereby provide considerable informational grist for use by the remote peripherals to thereby more likely facilitate additional not-otherwise-supported functionality.

Referring now to FIG. **3**, the movable barrier operator **10** related above serves as an appropriate platform to effect a process **30** wherein one or more predetermined operational status conditions are detected **31**. In a preferable approach, monitoring (and/or condition occurrence sensitivity) to support such detection occurs on a regular, or even substantially constant, basis. It is also preferred that a plurality of operational status conditions be monitored such that a plurality of differing operational status conditions can be so detected as they occur. As noted earlier, such monitoring and detection can result through one or more operational status condition sensors and/or through the ability of the controller to self-monitor its own operational status.

Upon detecting such a condition, the process **30** then forms **32** a message that includes content to relate, reflect, or otherwise correspond to the detected status condition. In an optional approach, this message can be formed to include an identifier for the movable barrier operator. For example, and referring now momentarily to FIG. **4**, such a message **40** can include a first field **41** that includes a specific identification number that is at least relatively unique to a given movable barrier operator and that also includes one or more additional data fields. A single data field can be used if desired to contain information that corresponds to the specified status condition. As another approach, and as illustrated, a plurality of fields (from field **1 41** to field N **43**) can be provided, with each field corresponding to, for example, a particular monitored condition. The content of such fields could then comprise one or more flags or other indicia to indicate a particular present status for each such field. (In another approach, such indicia could also provide an indication as to an anticipated or planned change to the status of a given condition including, where available, an anticipated or planned temporal schedule for effecting such changes.)

Upon receipt of such a message, a remote peripheral can use the identifying information to determine whether the received information corresponds to a relevant movable barrier operator (i.e., to a movable barrier operator with which the remote peripheral has been previously associated). When information from an unrecognized movable barrier operator is received for whatever reason or due to whatever circumstance, the remote peripheral can choose to simply ignore the information and thereby avoid taking a potentially inappropriate action.

Returning again to FIG. **3**, the process **30** then provides for automatic transmission **33** of the status condition message via the carrier/transmitter of choice and as otherwise is generally described above. It would of course be possible to transmit other signals and messages via the transmitter too, if desired. For example, specific control signals could also be transmitted (either as part of the above-described message or as a separate message) as an integral part of the overall control strategy of the movable barrier operator.

In a similar fashion, and referring now to FIG. **5**, the above-described remote peripheral **20** can serve as a suitable platform to effect a corresponding process **50** wherein the process **50** detects **51** for the reception of status condition signals and, upon receiving such a signal, uses the corresponding data to thereby permit effectuation **52** of a corresponding predetermined action. As already noted, the corresponding predetermined action (or actions) can be many and varied. A non-exhaustive illustrative listing could include:

activating a light (either ambient lighting and/or signaling indicia);
deactivating a light;
activating an audible alarm;
deactivating an audible alarm;
manipulating a locking mechanism;
providing a corresponding information display;
allowing remote modification of configuration variables; and
initiating a timing mechanism.

Other possibilities of course exist. It should also be clearly understood that functions not yet conceived or enabled may also be well served and supported by these embodiments, as these embodiments are not dependent upon the movable barrier operator having an already-existing native ability to support such functionality. Instead, by providing movable barrier operator status indicia, the remote peripherals are themselves able to intuit when circumstances are appropriate to initiate or restrain their own functionality and features.

Those skilled in the art will recognize that a wide variety of modifications, alterations, and combinations can be made with respect to the above described embodiments without departing from the spirit and scope of the invention, and that such modifications, alterations, and combinations are to be viewed as being within the ambit of the inventive concept. For example, if desired, the movable barrier operator could also wirelessly transmit control signaling in addition to the status condition information. Though such control signaling may not offer a same degree of long term flexibility as the preferred approaches set forth above, such control signaling may nevertheless serve to facilitate one or more presently known and highly desired features or functions.

As another example, and referring now to FIG. **6**, a remote peripheral controller **22** can also couple to a wireless transmitter **62**. In turn, the movable barrier operator controller **11** can further couple to a wireless receiver **61** that serves to compatibly receive messages as transmitted by the remote peripheral controller **11**. This link can mirror the carrier/modulation/protocol mechanism described above for the movable barrier operator-to-remote peripheral link, or it can be different. As an illustrative example, the movable barrier operator can have a wireless status condition data transmitter that uses an infrared carrier and a receiver that uses a radio frequency carrier. So configured, a variety of useful purposes can be served. As one example, the remote peripheral controller **22** can query the movable barrier operator controller **11** via this communication mechanism to thereby cause the movable barrier operator controller **11** to respond with, for example, an updated status condition data message.

I claim:

1. A movable barrier operator comprising:
a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;
a movable barrier interface that is operably coupled to the controller;
a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:
corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and
comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

2. The movable barrier operator of claim **1** and further comprises at least one condition status sensor that is operably coupled to the controller.

3. The movable barrier operator of claim **2** wherein the wireless status condition data transmitter transmits data that corresponds to the at least one condition status sensor.

4. The movable barrier of claim **1** and further comprising a receiver that is operably coupled to the controller.

5. The movable barrier operator of claim **1** wherein the plurality of operating states includes at least one of:
moving a movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;
a lighting status change;
a vacation mode status change;
detecting a likely proximal presence of a vehicle;
detecting the identification of a proximal vehicle; and
receiving an operating parameter alteration signal.

6. The movable barrier operator of claim **1** wherein the wireless status condition data transmitter comprises a radio frequency carrier-based transmitter.

7. The movable barrier operator of claim **1** wherein the wireless status condition data transmitter comprises an infrared carrier-based transmitter.

8. The movable barrier operator of claim **1** wherein the wireless status condition data transmitter comprises a sonic carrier-based transmitter.

9. The movable barrier operator of claim **1** wherein the controller includes transmitter control means for automatically causing the wireless status condition data transmitter to transmit a data signal.

10. The movable barrier operator of claim **9** wherein the transmitter control means automatically causes the wireless status condition data transmitter to transmit the status condition data signal in response to detecting at least a first predetermined condition.

11. The movable barrier operator of claim **10** wherein the first predetermined condition comprises at least one of the controller:

moving a movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;
receiving an operating parameter alteration signal;
expiration of a predetermined duration of time; and
attainment of a predetermined point in time.

12. The movable barrier operator of claim **4** wherein the controller includes transmitter control means for automatically causing the wireless status condition data transmitter to transmit a status condition data signal in response to the receiver receiving at least a first predetermined signal.

13. The movable barrier operator of claim **12** wherein the wireless data transmitter comprises an infrared carrier-based transmitter and the receiver comprises a radio frequency carrier-based receiver.

14. A method comprising:
at a movable barrier operator:
detecting at least one predetermined condition as corresponds to a present operational status defined, at least in part, by at least two operating states, of the movable barrier operator;
in response to detecting the at least one predetermined condition, automatically wirelessly transmitting a status condition signal that:
represents the present operational status defined, at least in part, by the at least two operating states; and
comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

15. The method of claim **14** wherein detecting at least one predetermined condition includes detecting at least one of:
moving a movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;
a lighting status change;
a vacation mode status change;
detecting a likely proximal presence of a vehicle; and
receiving an operating parameter alteration signal.

16. The method of claim **14** wherein detecting at least one predetermined condition includes:
monitoring a plurality of operational status conditions;
detecting the at least one predetermined condition when any of the plurality of operational status conditions occurs.

17. The method of claim **14** wherein detecting at least one predetermined condition includes at least one of:
receiving sensor information from a sensor that senses the at least one predetermined condition; and
monitoring an operating state of the movable barrier operator.

18. The method of claim **14** wherein automatically wirelessly transmitting a status condition signal includes automatically wirelessly transmitting a status condition signal using at least one of:
a radio frequency carrier;
a sonic carrier; and
an optical carrier.

19. The method of claim **18** and further comprising also using a wireline connection to transmit at least a portion of the status condition signal.

20. The method of claim **14** wherein automatically wirelessly transmitting a status condition signal includes automatically wirelessly transmitting a status condition signal that includes an identifier that corresponds to the movable barrier operator.

21. The method of claim **14** and further comprising: at a remote peripheral apparatus:
receiving the status condition signal;
in response to receiving the status condition signal, effecting a predetermined action that corresponds to the status condition signal.

22. The method of claim **21** wherein the predetermined action includes at least one of:
activating a light;
deactivating a light;
activating an audible alarm;
deactivating an audible alarm;
manipulating a locking mechanism;
providing a corresponding information display;
allowing remote modification of configuration variables; and
initiating a timing mechanism.

23. The method of claim **14** wherein detecting at least one predetermined condition includes receiving a wireless signal that includes, at least in part, an inquiry signal.

24. An apparatus comprising:
a movable barrier operator having:
a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states; and
a wireless status condition transmitter operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:
corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and
comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator;
a remote peripheral having:
a wireless receiver that is communicatively compatible with the wireless transmitter;
a peripheral controller that is operably coupled to the wireless receiver.

25. The apparatus of claim **24** wherein the plurality of operating states includes at least one of:
moving a movable barrier in a first direction;
moving the movable barrier in a second direction;
reversing movement of the movable barrier;
halting movement of the movable barrier;
detecting a likely presence of an obstacle to movement of the movable barrier;
detecting a likely proximal presence of a human;
receiving a wireless remote control signal;
receiving a wireline remote control signal;
receiving a learning mode initiation signal;

a lighting status change;

a vacation mode status change;

detecting a likely proximal presence of a vehicle; and

receiving an operating parameter alteration signal.

26. The apparatus of claim **24** wherein the remote peripheral comprises at least one of:

an informational display;

a light fixture;

a remote access interface;

a timer apparatus; and

an alarm.

27. The apparatus of claim **24** wherein the movable barrier operator further includes a wireless receiver that is operably coupled to the controller.

28. The apparatus of claim **27** wherein the remote peripheral further includes a wireless transmitter that is communicatively compatible with the wireless receiver of the movable barrier operator and that is operably coupled to the peripheral controller.

29. The apparatus of claim **24** and further comprising a plurality of the remote peripherals.

30. The apparatus of claim **24** wherein the peripheral controller includes reception means for determining when a wireless signal as received from the movable barrier operator includes an identifier that corresponds to the movable barrier operator.

31. The apparatus of claim **30** wherein the reception means further provides a first control signal when the wireless signal does include the identifier and does not provide the first control signal when the wireless signal does not include the identifier.

* * * * *

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United States Patent

(12) **United States Patent**
Butler

(10) **Patent No.: US 7,635,966 B2**
(45) **Date of Patent: Dec. 22, 2009**

(54) **BARRIER MOVEMENT OPERATOR BATTERY BACKUP AND POWER EQUIPMENT BATTERY CHARGING CENTER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 341 days.

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(58) **Field of Classification Search** 320/109; 340/545.1; 455/573

See application file for complete search history.

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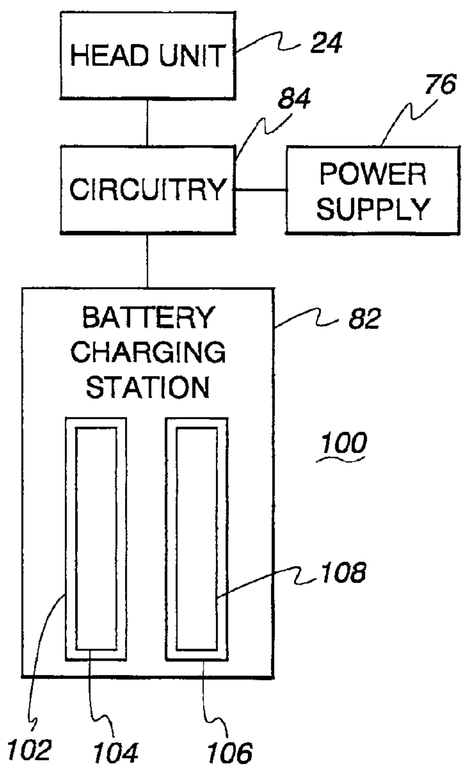
(57) **ABSTRACT**

A system includes a rechargeable battery backup for a barrier movement operator. A barrier movement operator controls the movement of a moveable barrier. The barrier movement operator has a head unit to command the moveable barrier to perform moveable barrier functions. The head unit is supplied power by a power source. A battery charging station is in electrical communication with at least one rechargeable battery and in electrical communication with the head unit to supply power to the at least one rechargeable battery. Circuitry is electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit. The system also includes electrically powered equipment comprising an apparatus for receiving the at least one rechargeable battery. The electrically powered equipment is adapted to be powered by the at least one rechargeable battery to perform a predetermined function.

22 Claims, 5 Drawing Sheets



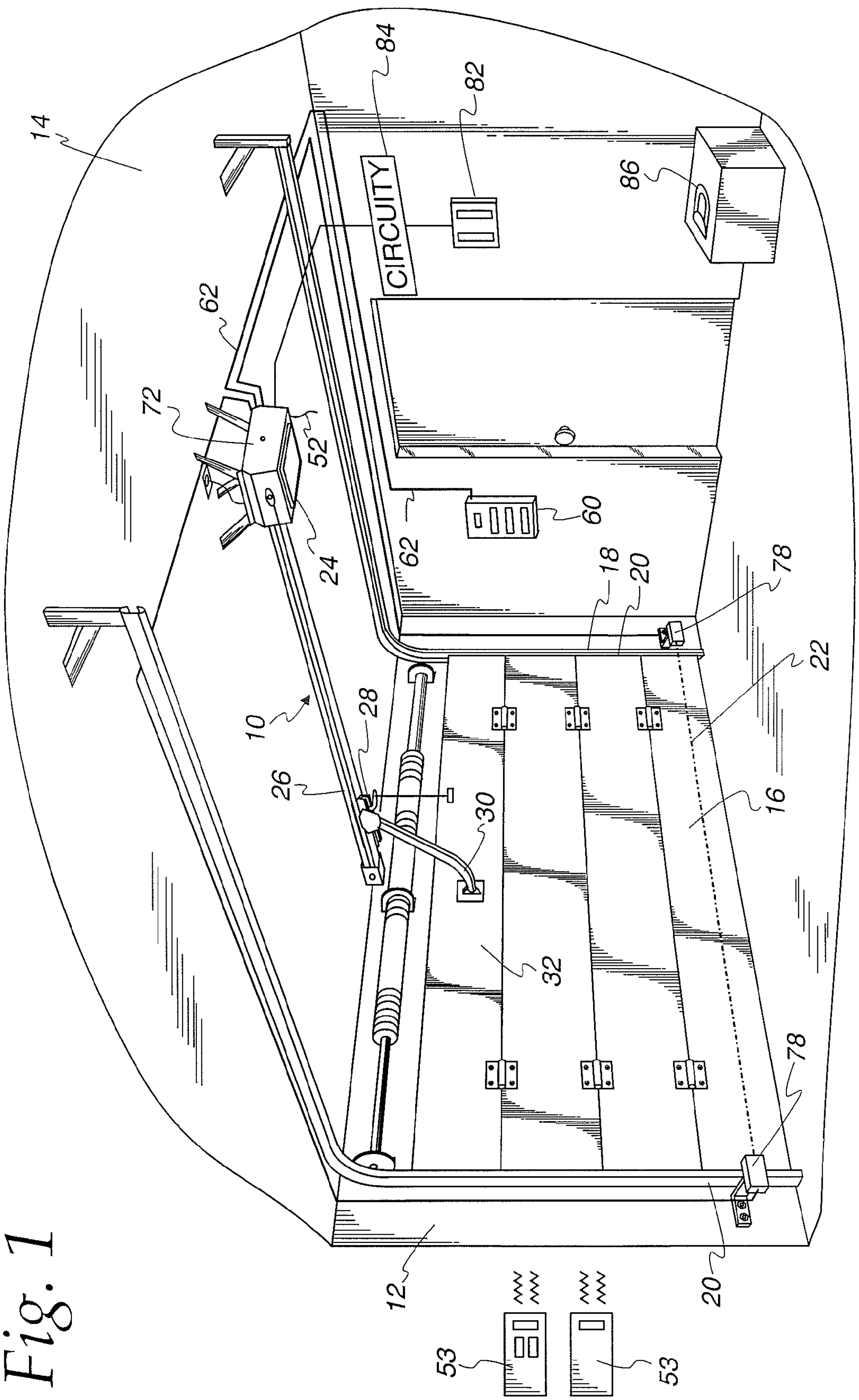

14
84
82
CIRCUITY
86
62
72
52
24
60
62
18
20
78
22
10
28
26
30
16
32
78
12
20
53
53

Fig. 1

Fig. 3

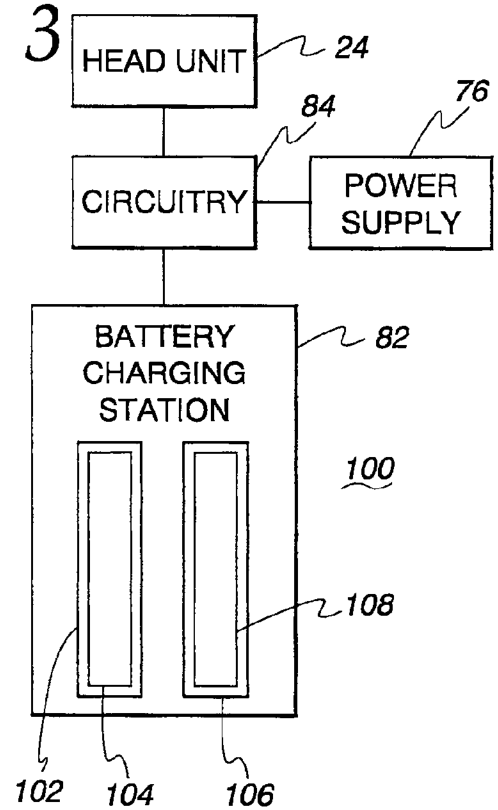

HEAD UNIT
24
84
76
CIRCUITRY
POWER SUPPLY
BATTERY CHARGING STATION
82
100
108
102
104
106

Fig. 2

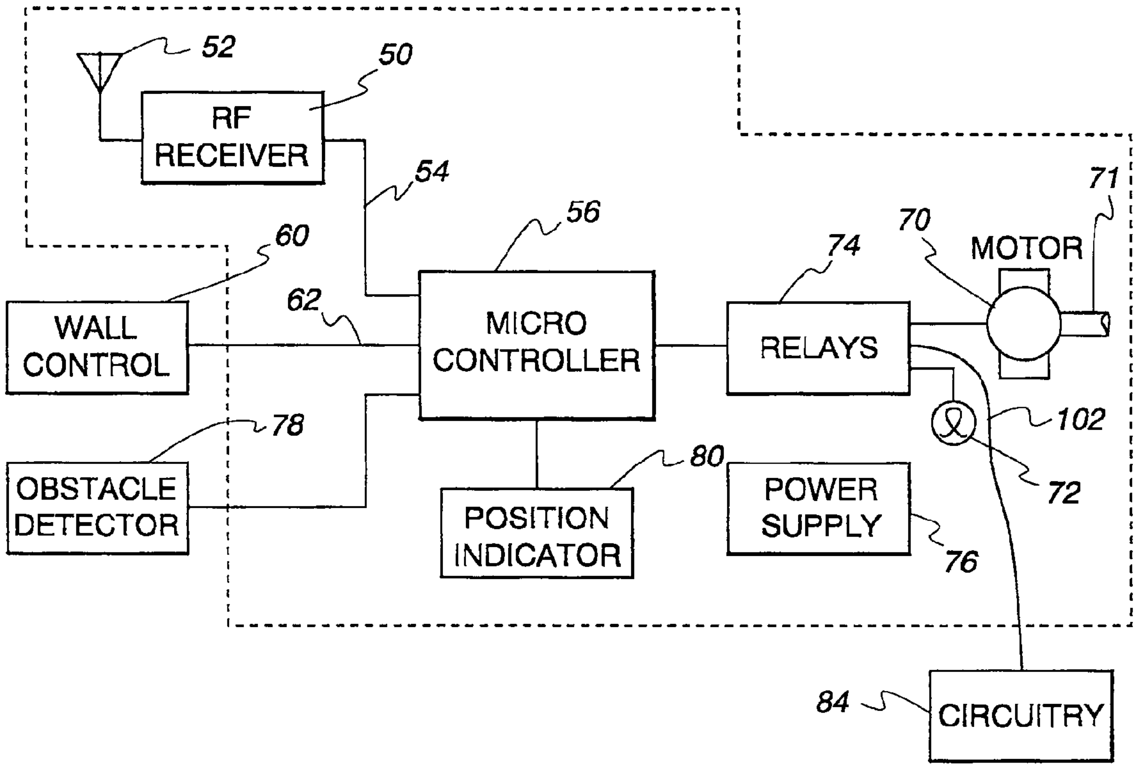

52
50
RF RECEIVER
54
56
60
62
WALL CONTROL
MICRO CONTROLLER
74
RELAYS
70
MOTOR
71
102
72
78
OBSTACLE DETECTOR
80
POSITION INDICATOR
POWER SUPPLY
76
84
CIRCUITRY

Fig. 4

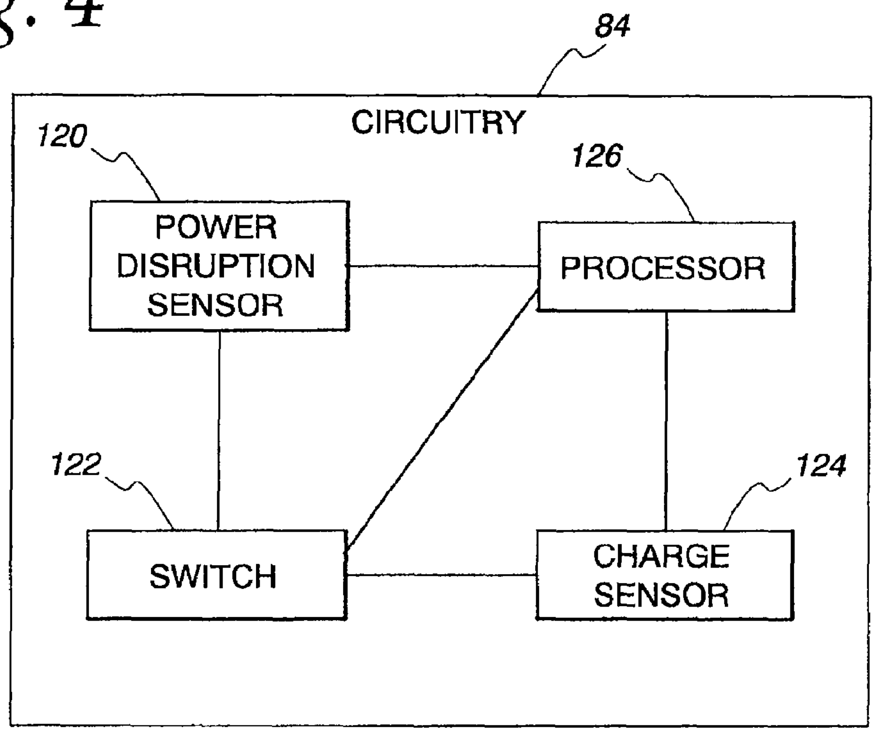

84
CIRCUITRY
120
POWER DISRUPTION SENSOR
126
PROCESSOR
122
SWITCH
124
CHARGE SENSOR

Fig. 5

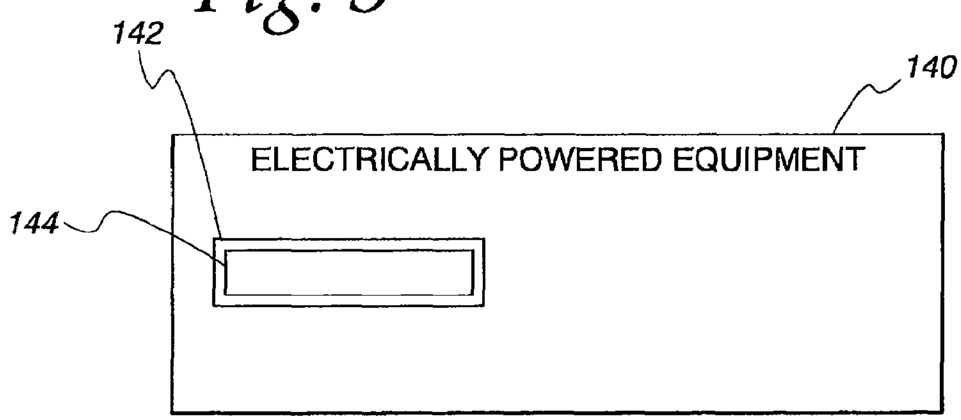

142
140
ELECTRICALLY POWERED EQUIPMENT
144

Fig. 6

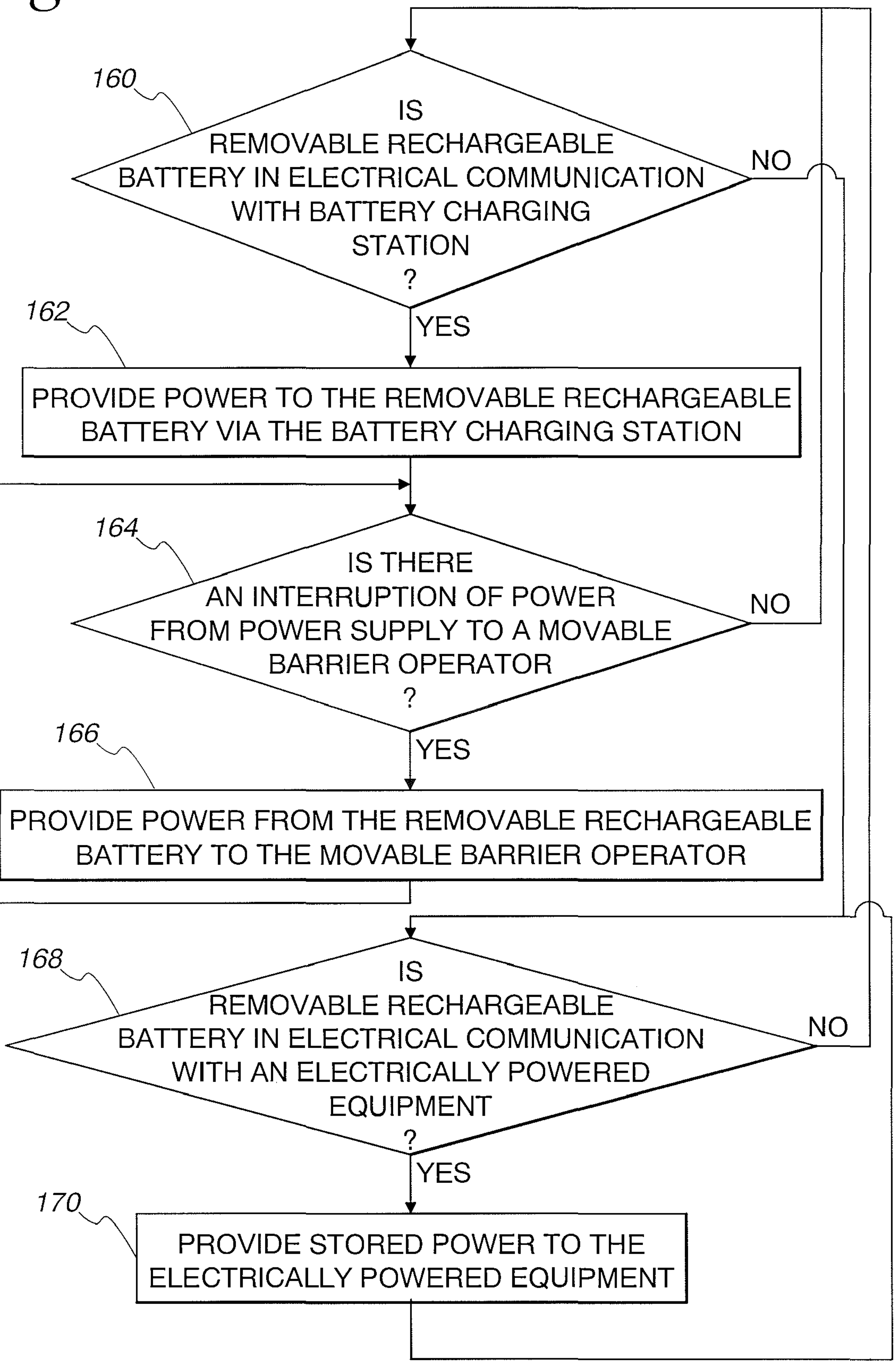
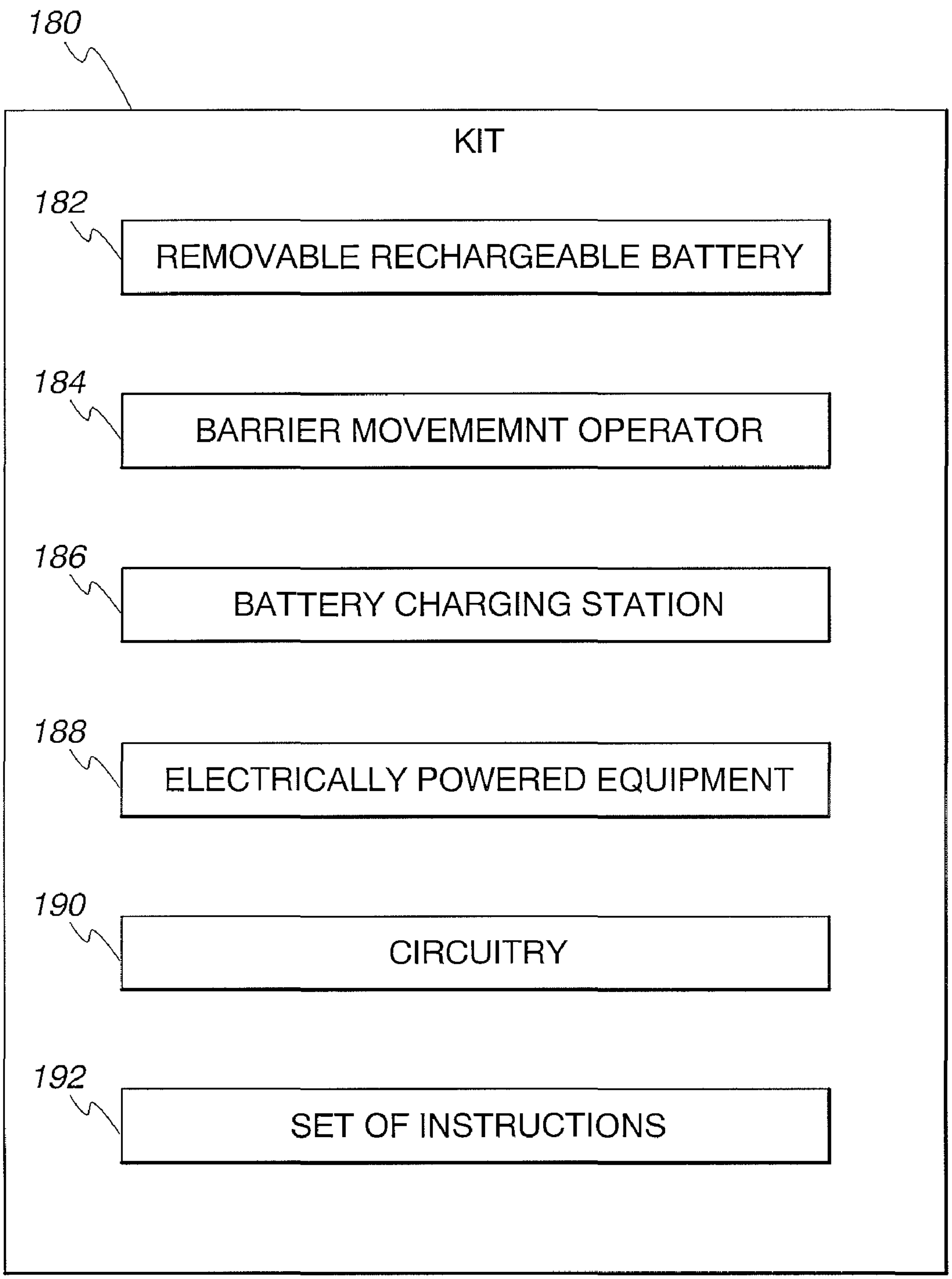

160
IS REMOVABLE RECHARGEABLE BATTERY IN ELECTRICAL COMMUNICATION WITH BATTERY CHARGING STATION ?
NO
YES
162
PROVIDE POWER TO THE REMOVABLE RECHARGEABLE BATTERY VIA THE BATTERY CHARGING STATION
164
IS THERE AN INTERRUPTION OF POWER FROM POWER SUPPLY TO A MOVABLE BARRIER OPERATOR ?
NO
YES
166
PROVIDE POWER FROM THE REMOVABLE RECHARGEABLE BATTERY TO THE MOVABLE BARRIER OPERATOR
168
IS REMOVABLE RECHARGEABLE BATTERY IN ELECTRICAL COMMUNICATION WITH AN ELECTRICALLY POWERED EQUIPMENT ?
NO
YES
170
PROVIDE STORED POWER TO THE ELECTRICALLY POWERED EQUIPMENT

Fig. 7


180
KIT
182
REMOVABLE RECHARGEABLE BATTERY
184
BARRIER MOVEMEMNT OPERATOR
186
BATTERY CHARGING STATION
188
ELECTRICALLY POWERED EQUIPMENT
190
CIRCUITRY
192
SET OF INSTRUCTIONS

BARRIER MOVEMENT OPERATOR BATTERY BACKUP AND POWER EQUIPMENT BATTERY CHARGING CENTER

TECHNICAL FIELD

This invention relates generally to rechargeable backup batteries, and more particularly to a rechargeable battery backup for use with both a barrier movement operator and electrically powered equipment such as a power tool.

BACKGROUND

Various remotely controllable access control mechanisms are known, including barrier movement operators for movable barriers including, but not limited to, single and segmented garage doors, pivoting and sliding doors and cross-arms, rolling shutters, and the like. In general, each such system includes a primary barrier control mechanism. The latter couples in an appropriate way to a corresponding barrier and causes the barrier to move (typically between closed and opened positions).

Barrier movement operators, such as garage door openers, are often powered via an electrical outlet. In the event of a power outage, however, many of the garage door openers are unable to open or close a garage door. Instead, such garage doors must be manually opened and closed. This can be problematic for children or disabled people attempting to manually move these garage doors.

Some current barrier movement operators can be powered via a backup battery. These barrier movement operators receive power from the backup battery in the event of a power disruption from the electrical outlet and can be operated as long as the backup battery has a sufficient amount of electrical power stored.

These battery backups are independent items which are typically used only for operating the barrier movement operator. These systems require some method to recharge the batteries either built into the operator or as an additional power supply for battery charging.

Cordless power tools also require batteries and recharging systems. Cordless power tools include tools such as saws, drills, lights, and garden tools. Usually the battery is a plug-in device which is removed from the tool to charge in a separate cradle. This cradle is typically designed only to recharge the battery. It is often expensive, however, to use separate batteries for electrically powered tools and for the barrier movement operators.

SUMMARY OF THE INVENTION

The present invention is directed to a system including a rechargeable battery backup for a barrier movement operator. The barrier movement operator controls the movement of a moveable barrier. The barrier movement operator has a head unit to command the moveable barrier to perform moveable barrier functions. The head unit is supplied power by a power source. A battery charging station is in electrical communication with at least one rechargeable battery and in electrical communication with the head unit to supply power to the at least one rechargeable battery. Circuitry is electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit. The system also includes electrically powered equipment comprising an apparatus for receiving the at least one rechargeable battery. The electrically powered equipment is adapted to be powered by the at least one rechargeable battery to perform a predetermined function.

The present invention is further directed to a battery charging apparatus. A battery charging station is in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery. The at least one rechargeable battery is removably connectable to electrically powered equipment to provide power to the electrically powered equipment. Circuitry is electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.

The present invention is also directed to a method of power flow between at least one rechargeable battery, electrically powered equipment, and a barrier movement operator. A determination is made regarding whether the at least one rechargeable battery is in electrical communication with a battery charging station. Power is provided from a power source to the at least one rechargeable battery via the battery charging station. Stored power is provided from the at least one rechargeable battery to the head unit via the battery charging station to perform movable barrier functions. Power is also provided from the at least one rechargeable battery to the electrically powered equipment in response to the at least one rechargeable battery being electrically connected to the electrically powered equipment.

The present invention is further directed to a kit having several items, including a rechargeable battery. A barrier movement operator is provided for controlling movement of a moveable barrier. The barrier movement operator has a head unit to command the moveable barrier to perform moveable barrier functions in response to electrical means and in response to the rechargeable battery. A battery charging station supplies power to at least one rechargeable battery. Electrically powered equipment is adapted to be powered by the at least one rechargeable battery to perform a predetermined function. Circuitry is electrically connected to the battery charging station. A set of instructions is provided for the connecting of the circuitry and the battery charging station.

The above summary of the present invention is not intended to represent each embodiment or every aspect of the present invention. The detailed description and Figures will describe many of the embodiments and aspects of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The above needs are at least partially met through provision of the method and apparatus for remote control described in the following detailed description, particularly when studied in conjunction with the drawings, wherein:

FIG. **1** is a perspective view of a garage including a barrier movement operator, specifically a garage door operator, having associated with it a passive infrared detector in a wall control unit and embodying the present invention;

FIG. **2** is a block diagram showing the relationship between major electrical systems of a portion of the garage door operator shown in FIG. **1**;

FIG. **3** illustrates a power supply system according to at least one embodiment of the invention;

FIG. **4** illustrates the circuitry according to at least one embodiment of the invention;

FIG. **5** illustrates electrically powered equipment according to at least one embodiment of the invention;

FIG. **6** illustrates a method of utilizing a removable rechargeable battery according to an embodiment of the invention; and

FIG. **7** illustrates a kit according to at least one embodiment of the invention.

Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of various embodiments of the present invention. Also, common but well-understood elements that are useful or necessary in a commercially feasible embodiment are typically not depicted in order to facilitate a less obstructed view of these various embodiments of the present invention.

DETAILED DESCRIPTION

Generally speaking, pursuant to these various embodiments, a rechargeable battery backup is provided for use with a barrier movement operator. The barrier movement operator normally receives power from a power source such as an electrical outlet. In the event, however, of a power disruption such as a power outage, the rechargeable battery backup may provide power to the barrier movement operator to allow the barrier movement operator to move a movable barrier. For example, the movable barrier may be a garage door. The rechargeable battery backup may be inserted in a battery charging station. In some embodiments, the battery charging station may allow receipt of multiple rechargeable backup batteries. In other embodiments, a single rechargeable battery may be utilized. Circuitry is electrically connected to the battery charging station and may electrically connect the rechargeable backup battery to the barrier movement operator in the event of a power failure. The circuitry may also electrically connect the battery charging station to a power source to charge the rechargeable battery backup in the event that the rechargeable battery backup is not fully charged. The power source may be the same power source that normally supplies power to the barrier movement operator.

The rechargeable battery backup may be electrically connected to the battery charging station by, for example, manual insertion into a sleeve or other battery receiving portion of the battery charging station. The rechargeable battery backup may also be utilized to power other devices such as electrically powered equipment. The electrically powered equipment may comprise, for example, a tool. The electrically powered equipment may be a saw, drill, light, garden tool, or any other equipment or tool which is capable of being powered by a battery. The rechargeable battery backup may be manually removed from the battery charging station and inserted into the electrically powered equipment. After the electrically powered equipment has been utilized, the rechargeable battery backup may be removed from the electrically powered equipment and reinserted into the battery charging station.

Referring now to drawings and especially to FIG. **1**, a barrier movement operator embodying the present invention is shown therein and generally identified by reference numeral **10**. The barrier movement operator, in this embodiment a garage door operator **10**, is positioned within a garage **12**. More specifically, it is mounted to a ceiling **14** of the garage **12** for operation, in this embodiment, of a multipanel garage door **16**. The multipanel garage door **16** includes a plurality of rollers **18** rotatably confined within a pair of tracks **20** positioned adjacent to and on opposite sides of an opening **22** for the garage door **16**.

The garage door operator **10** also includes a head unit **24** for providing motion to the garage door **16** via a rail assembly **26**. The rail assembly **26** includes a trolley **28** for releasable connection of the head unit **24** to the garage door **16** via an arm **30**. The arm **30** is connected to an upper portion **32** of the garage door **16** for opening and closing it. The trolley **28** is connected to an endless chain to be driven thereby. The chain is driven by a sprocket in the head unit **24**. The sprocket acts as a power takeoff for an electric motor located in the head unit **24**.

The head unit **24** includes a radio frequency receiver **50**, as may best be seen in FIG. **2**, having an antenna **52** associated with it for receiving coded radio frequency transmissions from one or more radio transmitters **53** which may include portable or keyfob transmitters or keypad transmitters. The radio receiver **50** is connected via a line **54** to a microcontroller **56** which interprets signals from the radio receiver **50** as code commands to control other portions of the garage door operator **10**.

A wall control unit **60** communicates over a line **62** with the head unit microcontroller **56** to effect control of a garage door operator motor **70**, and a light **72** via relay logic **74** connected to the microcontroller **56**. The entire head unit **24** is powered from a power supply **76**. In addition, the garage door operator **10** includes an obstacle detector **78** which optically or via an infrared pulsed beam detects when the garage door opening **22** is blocked and signals the microcontroller **56** of the blockage. The microcontroller **56** then causes a reversal or opening of the door **16**. In addition, a position indicator **80** indicates to the head unit microcontroller **56**, through at least part of the travel of the door **16**, the door position so that the microcontroller **56** can control the close position and the open position of the door **16** accurately. A battery charging station **82** is in electrical communication with the power supply **76** via circuitry **84**, as discussed below with respect to FIGS. **3** and **4**. The battery charging station **82** may be utilized to recharge one removable rechargeable battery, or multiple removable rechargeable batteries, depending on the application. The battery charging station **82** may receive power to charge the removable rechargeable battery directly from the power supply **76**, which may comprise an electrical outlet. Alternatively, the removable rechargeable battery may be charged by the head unit **24**, which itself is powered by the power supply **76**. The removable rechargeable battery may be manually removed and inserted into electrically powered equipment **86**, such as the illustrated chainsaw of FIG. **1**.

FIG. **3** illustrates a power supply system **100** according to at least one embodiment of the invention. As shown, the power supply system **100** includes the circuitry **84**, the power supply **76**, and the battery charging station **82**. The circuitry **84** is also in communication with the head unit **24** of the barrier movement operator **10**. The battery charging station **82** includes a first receptacle **102** for receiving a first removable rechargeable battery **104** and a second receptacle **106** for receiving a second removable rechargeable battery **108**. When the first removable rechargeable battery **104** is located in the first receptacle **102** and the second removable rechargeable battery **108** is located in the second receptacle **106**, the first removable rechargeable battery **104** and the second removable rechargeable battery **108** may be charged with power supplied by the power supply **76**. The circuitry **84** may control the flow of power between the power supply **76** and the battery charging station **82**, and between the battery charging station **82** and the head unit **24** of the barrier movement operator **10**.

In the event that the power supply **76** is supplying sufficient power to the barrier movement operator **10**, the circuitry **84** allows power from the power supply **76** to flow to the battery charging station **82** where it flows into the first removable rechargeable battery **104** and the second removable rechargeable battery **108**. It should be appreciated that the battery charging station **82** may hold more or fewer than two removable rechargeable batteries, depending on the application.

In the event of an interruption of the supply of power from the power supply **76**, the circuitry **84** may couple the battery charging station **82** to the head unit **24** of the barrier movement operator **10**, such that the first removable rechargeable battery **104** and the second removable rechargeable battery **108** may provide power to permit the barrier movement operator **10** to function as though there had been no power supply **76** disruption.

FIG. **4** illustrates the circuitry **84** according to at least one embodiment of the invention. As shown, the circuitry **84** includes a power disruption sensor **120**, a switch **122**, and a charge sensor **124**. The power disruption sensor **120** detects whether the power supply **76** is supplying power to the barrier movement operator **10**. The charge sensor **124** detects whether any removable rechargeable batteries placed in the battery charging station **82**, such as the first removable rechargeable battery **104** and the second removable rechargeable battery **108**, are fully charged. The switch **122** is utilized to control the flow of power to and from the battery charging station **82**. The circuitry **84** may also include a processor **126** to control the switch **122**. Alternatively, the circuitry **84** may include some other logic to control operation of the switch **122**.

In the event that the power supply **76** is supplying sufficient power and the first removable rechargeable battery **104** and the second removable rechargeable battery **108** are fully charged, the switch **122** may be open such that power from the power supply **76** is not supplied to the fully charged first removable rechargeable battery **104** and second removable rechargeable battery **108**. Alternatively, in the event that the power supply **76** is supplying sufficient power and the first removable rechargeable battery **104** and the second removable rechargeable battery **108** are not fully charged, the switch **122** may be positioned such that power from the power supply **76** is supplied to charge the first removable rechargeable battery **104** and the second removable rechargeable battery **108**. In another example, in the event that there is a disruption of power from the power supply **76** to the barrier movement operator **10**, the switch **122** may positioned such that the stored power from the first removable rechargeable battery **104** and the second removable rechargeable battery **108** is provided to the barrier movement operator **10** to allow the barrier movement operator **10** to function.

FIG. **5** illustrates electrically power equipment **140** according to at least one embodiment of the invention. The electrically powered equipment **140** may comprise a saw, drill, light, garden tool, or any other equipment or tool which is capable of being powered by a battery, as discussed above. As illustrated, the electrically power equipment **140** includes a battery receptacle **142** for receiving a removable rechargeable battery **144**, such as the first removable rechargeable battery **104** or the second removable rechargeable battery **108** discussed above with respect to FIG. **3**. The electrically powered equipment **140** may also optionally include a power cord for plugging into an electrical outlet. In the event that a user decides to utilize the electrically powered equipment **140**, the user may remove a removable rechargeable battery **144** from the battery charging station **82** and insert it into the battery receptacle **142**. After the user is finished with the electrically powered equipment **140**, the user may remove the removable rechargeable battery **144** from the battery receptacle **142** and place it back in the battery charging station **82** to be recharged.

FIG. **6** illustrates a method of utilizing the removable rechargeable battery **144** according to an embodiment of the invention. First, at operation **160**, a determination is made as to whether the removable rechargeable battery **144** is in electrical communication with the battery charging station **82**. If "yes," processing proceeds to operation **162**, where power is provided to the removable rechargeable battery **144** via the battery charging station **82**. If "no" at operation **160**, processing proceeds to operation **168**. At operation **164**, a determination is made regarding whether there is an interruption of power from a power supply to the barrier movement operator **10**. If "yes," processing proceeds to operation **166** where power from the removable rechargeable battery **144** is provided to the barrier movement operator **10**. Processing subsequently proceeds to operation **164**. If "no" at operation **164**, on the other hand, processing returns to operation **160**.

At operation **168**, a determination is made as to whether the removable rechargeable battery **144** is in electrical communication with the electrically powered equipment **140**. If "yes," processing proceeds to operation **170** where stored power from the removable rechargeable battery **144** is provided to the electrically powered equipment **140**, and then processing returns to operation **168**. If "no" at operation **168**, processing returns to operation **160**. The method illustrated in FIG. **6** may be implemented by logic or the processor within the circuitry **84**.

FIG. **7** illustrates a kit **180** according to at least one embodiment of the invention. The kit **180** may be sold to a user in, for example, a hardware or department store. The kit **180** includes a removable rechargeable battery **182**. Alternatively, the kit **180** may include multiple removable rechargeable batteries **182**. The kit also includes a barrier movement operator **184**, a battery charging station **186**, electrically powered equipment **188**, circuitry **190**, and a set of instructions **192**. The set of instructions **192** may include assembly instructions regarding how to connect the barrier movement operator **184**, the battery charging station **186**, and the circuitry **190**. The set of instructions **192** may also include instructions regarding how to insert the removable rechargeable battery **182** into both the battery charging station **186** and the electrically powered equipment **188**.

The various embodiments described above provide a rechargeable battery backup for use with a barrier movement operator. The barrier movement operator normally receives power from a power source such as an electrical outlet. In the event, however, of a power disruption such as a power outage, the rechargeable battery backup may provide power to the barrier movement operator to allow the barrier movement operator to move a movable barrier. The rechargeable battery backup may be inserted in a battery charging station. In some embodiments, the battery charging station may allow receipt of multiple rechargeable backup batteries. In other embodiments, a single rechargeable battery may be utilized. Circuitry is electrically connected to the battery charging station and may electrically connect the rechargeable backup battery to the barrier movement operator in the event of a power failure. The circuitry may also electrically connect the battery charging station to a power source to charge the rechargeable backup battery in the event that the rechargeable battery backup is not fully charged. The power source may be the same power source that normally supplies power to the barrier movement operator.

The rechargeable battery backup may be electrically connected to the battery charging station by, for example, manual insertion into a sleeve or other battery receiving portion of the battery charging station. The rechargeable battery backup may also be utilized to power other devices such as electrically powered equipment. The electrically powered equipment may comprise, for example, a saw, drill, light, garden tool, or any other equipment or tool which is capable of being powered by a battery. The rechargeable battery backup may be manually removed from the battery charging station and inserted into the electrically powered equipment. After the electrically powered equipment has been utilized, the rechargeable battery backup may be removed from the electrically powered equipment and reinserted into the battery charging station.

By providing a rechargeable battery backup that can be used with both a barrier movement operator and an electrically powered equipment, instead of having to have separate batteries for both of these, a user can minimize the number of batteries needed to keep on hand. Also, a single battery charging station can be used for charging the rechargeable battery backup, instead of two separate battery charging stations or cradles as is required according to current system. Therefore, the user can conserve available space by simply using a single battery charging station.

Those skilled in the art will recognize that a wide variety of modifications, alterations, and combinations can be made with respect to the above described embodiments without departing from the spirit and scope of the invention, and that such modifications, alterations, and combinations are to be viewed as being within the ambit of the inventive concept.

I claim:

1. A system for providing a rechargeable battery backup for a barrier movement operator, comprising:
- a barrier movement operator for controlling the movement of a moveable barrier, the barrier movement operator having a head unit to command the moveable barrier to perform moveable barrier functions, wherein the head unit is supplied power by a power source;
- a battery charging station in electrical communication with at least one rechargeable battery and in electrical communication with the head unit to supply power to the at least one rechargeable battery;
- circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit; and
- electrically powered equipment other than and physically separate or separable from the barrier movement operator comprising an apparatus for receiving the at least one rechargeable battery and to be powered by the at least one rechargeable battery to perform a predetermined function.

2. The system of claim **1**, wherein the rechargeable battery is removably connectable to the electrically powered equipment.

3. The system of claim **1**, wherein the head unit is in communication with the battery charging station via a cord.

4. The system of claim **1**, further comprising an indication element to notify a user in response to at least one of:
- the at least one rechargeable battery being removed from the battery charging station, and
- the stored power of the at least one rechargeable battery being below a threshold amount.

5. The system of claim **4**, wherein the indication element comprises at least one of an audible indicator and a visual indicator.

6. The system of claim **1**, wherein the barrier movement operator is selected from the group consisting of: a garage door operator, a gate operator, and a commercial door operator.

7. The system of claim **1**, wherein the at least one rechargeable battery comprises at least two rechargeable batteries.

8. The system of claim **1**, wherein the electrically powered equipment comprises a tool.

9. A battery charging apparatus, comprising:
- a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery, the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment; and
- circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.

10. The battery charging apparatus of claim **9**, wherein the head unit is in communication with the battery charging station via a cord.

11. The battery charging apparatus of claim **9**, further comprising an indication element to notify a user in response to at least one of:
- the at least one rechargeable battery being removed from the battery charging station, and
  - the stored power of the at least one rechargeable battery being below the threshold amount.

12. The battery charging apparatus of claim **9**, wherein the indication element comprises at least one of an audible indicator and a visual indicator.

13. The battery charging apparatus of claim **9**, wherein the at least one rechargeable battery comprises at least two rechargeable batteries.

14. The battery charging apparatus of claim **9**, wherein the electrically powered equipment comprises a tool.

15. A method of power flow between at least one rechargeable battery, a barrier movement operator, electrically powered equipment other than and physically separate or separable from the barrier movement operator, the method comprising:
- detecting whether the at least one rechargeable battery is in electrical communication with a battery charging station;
- providing power from a power source to the at least one rechargeable battery via the battery charging station;
- providing stored power from the at least one rechargeable battery to the head unit via the battery charging station to perform movable barrier functions; and
- providing power from the at least one rechargeable battery to the electrically powered equipment in response to the at least one rechargeable battery being electrically connected to the electrically powered equipment.

16. The method of claim **15**, further comprising notifying a user in response to at least one of:
- the at least one rechargeable battery being removed from the battery charging station, and
- the stored power of the at least one rechargeable battery being below the threshold amount.

17. The method of claim **16**, wherein notifying comprises generating at least one of an audible indication and a visual indication.

18. The method of claim **15**, wherein the electrically powered equipment comprises a tool.

19. A kit comprising:

a barrier movement operator for controlling movement of a moveable barrier, the barrier movement operator having a head unit to command the moveable barrier to perform moveable barrier functions in response to electrical means and in response to at least one separable rechargeable battery;

a battery charging station configured to supply power to the at least one separable rechargeable battery that is configured to separably and electrically connect to and power electrically powered equipment other than and physically separate or separable from the barrier movement operator;

circuitry electrically connected to the battery charging station; and

a set of instructions for the connecting of the circuitry and the battery charging station.

20. The kit of claim **19**, wherein the electrically powered equipment comprises a tool.

21. The kit of claim **19**, further comprising the at least one separable rechargeable battery.

22. The kit of claim **19**, further comprising the electrically powered equipment other than and physically separate or separable from the barrier movement operator.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,635,966 B2
APPLICATION NO. : 11/477334
DATED : December 22, 2009
INVENTOR(S) : Brian Frederic Butler

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page:

The first or sole Notice should read --

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 518 days.

Signed and Sealed this

Ninth Day of November, 2010

David J. Kappos

David J. Kappos
Director of the United States Patent and Trademark Office

13 BLUETOOTH ADDRESSING

13.1 BLUETOOTH DEVICE ADDRESS (BD_ADDR)

Each Bluetooth transceiver is allocated a unique 48-bit Bluetooth device address (BD_ADDR). This address is derived from the IEEE802 standard. This 48-bit address is divided into three fields:

- LAP field: lower address part consisting of 24 bits
- UAP field: upper address part consisting of 8 bits
- NAP field: non-significant address part consisting of 16 bits

The LAP and UAP form the significant part of the BD_ADDR. The total address space obtained is 2^{32}.

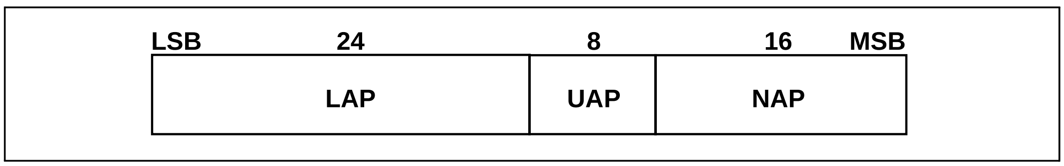


Figure 13.1: Format of BD_ADDR

13.2 ACCESS CODES

In the Bluetooth system, 72-bit and 68-bit access codes are used for signalling purposes. Three different access codes are defined, see also Section 4.2.1 on page 48:

- device access code (DAC)
- channel access code (CAC)
- inquiry access code (IAC)

There is one general IAC (GIAC) for general inquiry operations and there are 63 dedicated IACs (DIACs) for dedicated inquiry operations. All codes are derived from a LAP of the BD_ADDR. The device access code is used during page, page scan and page response substates. It is a code derived from the unit's BD_ADDR. The channel access code characterizes the channel of the piconet and forms the preamble of all packets exchanged on the channel. The channel access code is derived from the LAP of the master BD_ADDR. Finally, the inquiry access code is used in inquiry operations. A general inquiry access code is common to all Bluetooth units; a set of dedicated inquiry access codes is used to inquire for classes of devices.

The access code is also used to indicate to the receiver the arrival of a packet. It is used for timing synchronization and offset compensation. The receiver correlates against the entire sync word in the access code, providing a very robust signalling. During channel setup, the code itself is used as an ID packet to sup-

14 BLUETOOTH SECURITY

The Bluetooth technology provides peer-to-peer communications over short distances. In order to provide usage protection and information confidentiality, the system has to provide security measures both at the application layer and the link layer. These measures shall be appropriate for a peer environment. This means that in each Bluetooth unit, the authentication and encryption routines are implemented in the same way. Four different entities are used for maintaining security at the link layer: a public address which is unique for each user[1], two secret keys, and a random number which is different for each new transaction. The four entities and their sizes as used in Bluetooth are summarized in Table 14.1.

Entity	Size
BD_ADDR	48 bits
Private user key, authentication	128 bits
Private user key, encryption configurable length (byte-wise)	8-128 bits
RAND	128 bits

Table 14.1: Entities used in authentication and encryption procedures.

The Bluetooth device address (BD_ADDR) is the 48-bit IEEE address which is unique for each Bluetooth unit. The Bluetooth addresses are publicly known, and can be obtained via MMI interactions, or, automatically, via an inquiry routine by a Bluetooth unit.

The secret keys are derived during initialization and are further never disclosed. Normally, the encryption key is derived from the authentication key during the authentication process. For the authentication algorithm, the size of the key used is always 128 bits. For the encryption algorithm, the key size may vary between 1 and 16 octets (8 - 128 bits). The size of the encryption key shall be configurable for two reasons. The first has to do with the many different requirements imposed on cryptographic algorithms in different countries – both w.r.t. export regulations and official attitudes towards privacy in general. The second reason is to facilitate a future upgrade path for the security without the need of a costly redesign of the algorithms and encryption hardware; increasing the effective key size is the simplest way to combat increased computing power at the opponent side. Currently (1999) it seems that an encryption key size of 64 bits gives satisfying protection for most applications.

The encryption key is entirely different from the authentication key (even though the latter is used when creating the former, as is described in Section 14.5.4 on page 177). Each time encryption is activated, a new encryption key

1. The BD_ADDR is not a secured identity.

command may currently not be allowed), the event associated with the sent command will not be returned. The Command Status event will, in this case, return the appropriate error code in the Status parameter. On initial power-on, and after a reset, the Host can send a maximum of one outstanding HCI Command Packet until a Command Complete or Command Status event has been received. If an error occurs for a command for which a Command Complete event is returned, the Return_Parameters field may not contain all the return parameters specified for the command. The Status parameter, which explains the error reason and which is the first return parameter, will always be returned. If there is a Connection_Handle parameter or a BD_ADDR parameter right after the Status parameter, this parameter will also be returned so that the Host can identify to which instance of a command the Command Complete event belongs. In this case, the Connection_Handle or BD_ADDR parameter will have exactly the same value as that in the corresponding command parameter. It is implementation specific whether more parameters will be returned in case of an error.

Note: The BD_ADDR return parameter of the command Read_BD_ADDR is not used to identify to which instance of the Read_BD_ADDR command the Command Complete event belongs. It is therefore not mandatory for the Host Controller to return this parameter in case of an error.

If an error occurs for a command for which no Command Complete event is returned, all parameters returned with the event associated with this command may not be valid. The Host must take care as to which parameters may have valid values depending on the value of the Status parameter of the Complete event associated with the given command. The Command Complete and Command Status events contain a parameter called Num_HCI_Command_Packets, which indicates the number of HCI Command Packets the Host is currently allowed to send to the Host Controller. The Host Controller may buffer one or more HCI command packets, but the Host Controller must start performing the commands in the order in which they are received. The Host Controller can start performing a command before it completes previous commands. Therefore, the commands do not always complete in the order they are started. The Host Controller must be able to accept HCI Command Packets with up to 255 bytes of data excluding the HCI Command Packet header.

Each command is assigned a 2 byte Opcode used to uniquely identify different types of commands. The Opcode parameter is divided into two fields, called the OpCode Group Field (OGF) and OpCode Command Field (OCF). The OGF occupies the upper 6 bits of the Opcode, while the OCF occupies the remaining 10 bits. The OGF of 0x3F is reserved for vendor-specific debug commands. The OGF of 0x3E is reserved for Bluetooth Logo Testing. The organization of the Opcodes allows additional information to be inferred without fully decoding the entire Opcode.

US006392537B1

(12) **United States Patent**
Tazumi et al.

(10) **Patent No.: US 6,392,537 B1**
(45) **Date of Patent: May 21, 2002**

(54) **REMOTE MONITORING SYSTEM FOR AUTOMATIC DOOR SYSTEMS**

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(73) Assignee: **Nabco Limited**, Kobe (JP)

(21) Appl. No.: **09/258,969**

(22) Filed: **Feb. 26, 1999**

(30) **Foreign Application Priority Data**

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(52) **U.S. Cl.** **340/507**; 340/506; 340/825.06; 49/31; 187/316
(58) **Field of Search** 340/506, 507, 340/514, 825.06, 286.02; 49/31, 30, 25, 370; 187/316, 391, 393

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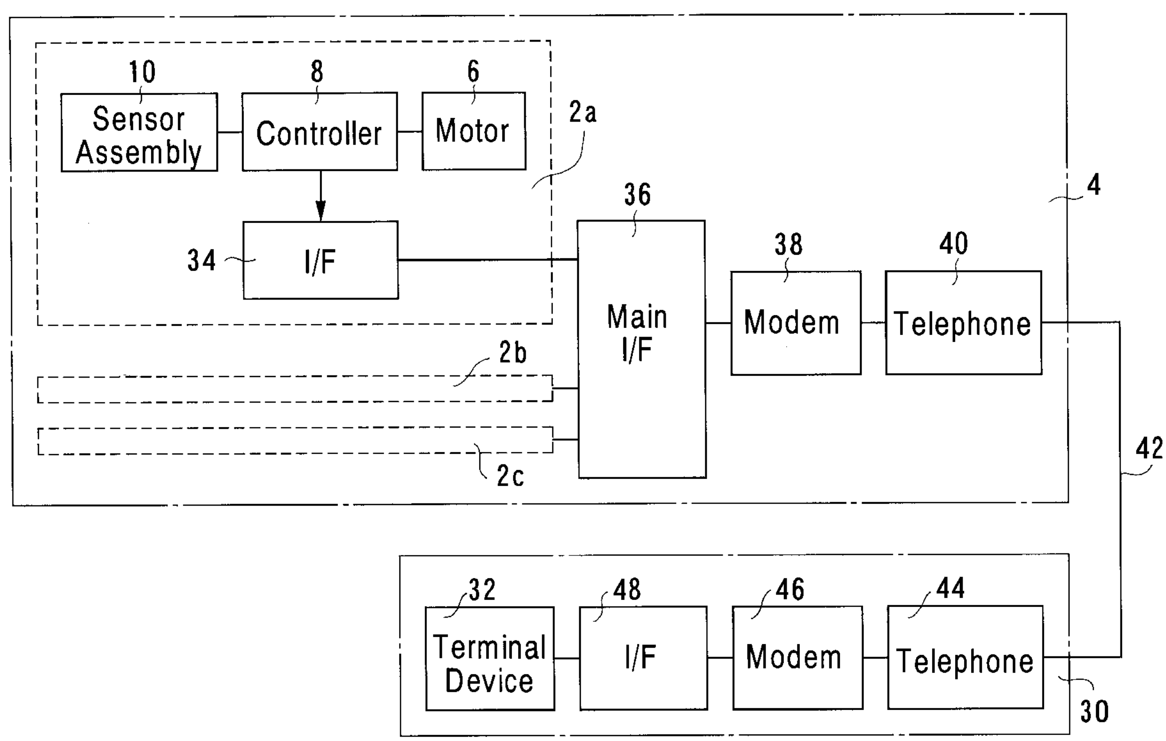
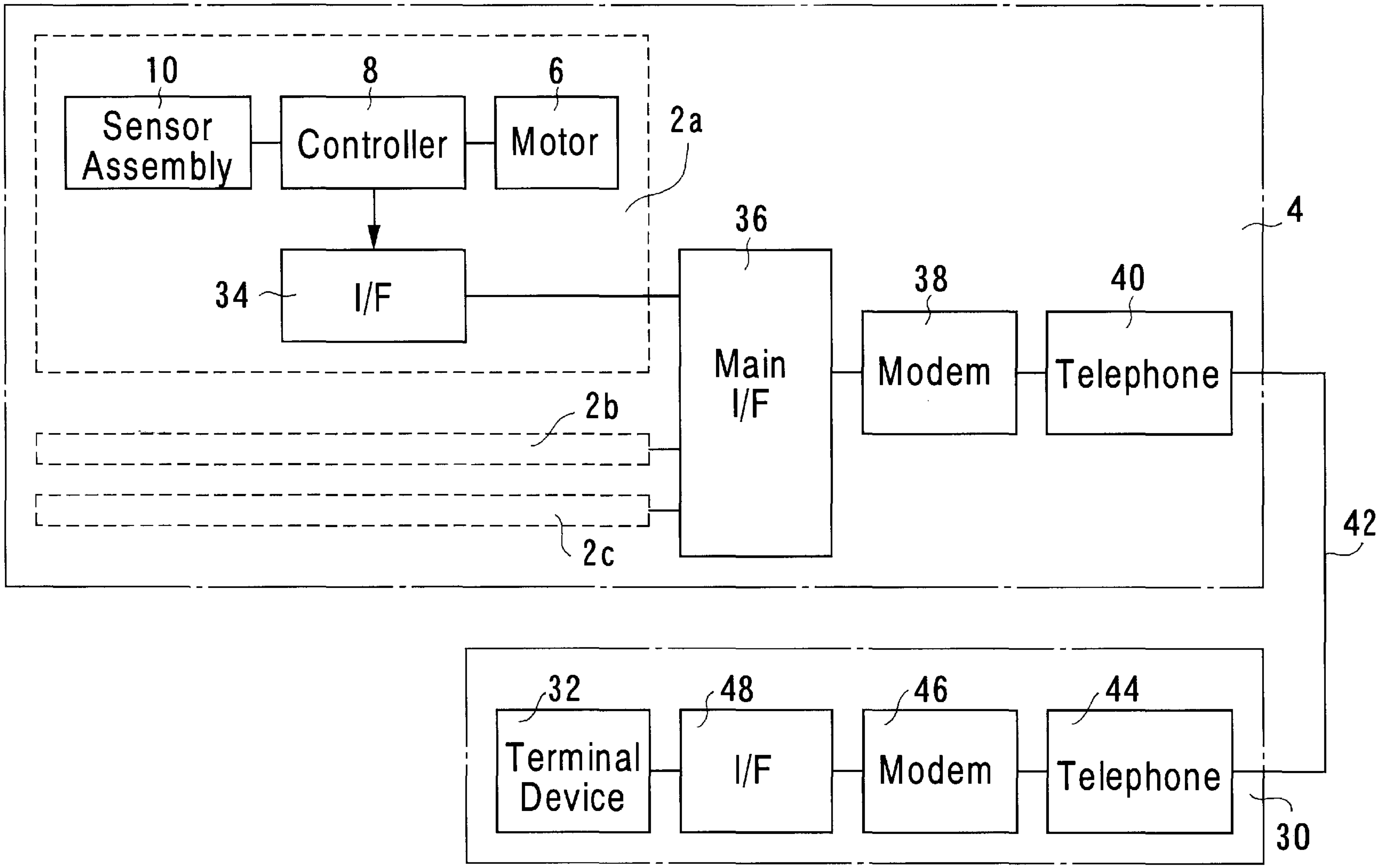
Primary Examiner—Daryl Pope
(74) *Attorney, Agent, or Firm*—Duane, Morris & Heckscher LLP

(57) **ABSTRACT**

A maintenance station monitors and maintains a plurality of automatic door systems at remote locations. Each door system includes a control unit for controlling the operation of an automatic door, and a self-diagnosing arrangement which operates in conjunction with the control operation of the control unit, to inspect the automatic door system for malfunctioning or broken part of the door system. When a failure is found in the automatic door system, the self-diagnosing arrangement of that door system sends information identifying that door system and information identifying the malfunctioning or broken part to the maintenance station via modems and telephones.

9 Claims, 9 Drawing Sheets





10
8
6
Sensor Assembly
Controller
Motor
2a
34
I/F
36
Main I/F
38
Modem
40
Telephone
4
2b
2c
42
32
48
46
44
Terminal Device
I/F
Modem
Telephone
30

FIG. 1

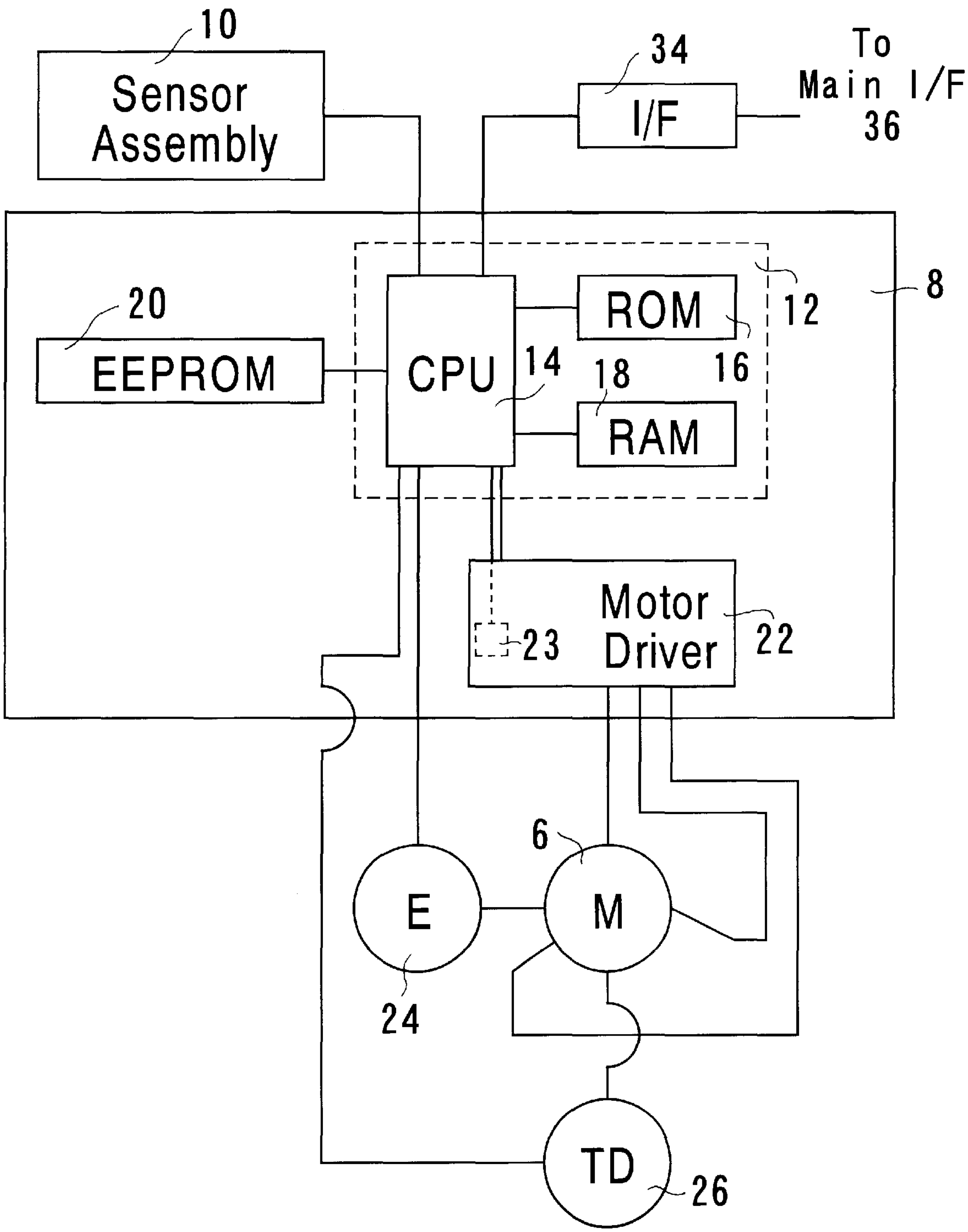

10
Sensor Assembly
34
I/F
To Main I/F
36
8
12
20
EEPROM
CPU
14
ROM
16
18
RAM
Motor Driver
22
23
6
E
M
24
TD
26

FIG. 2

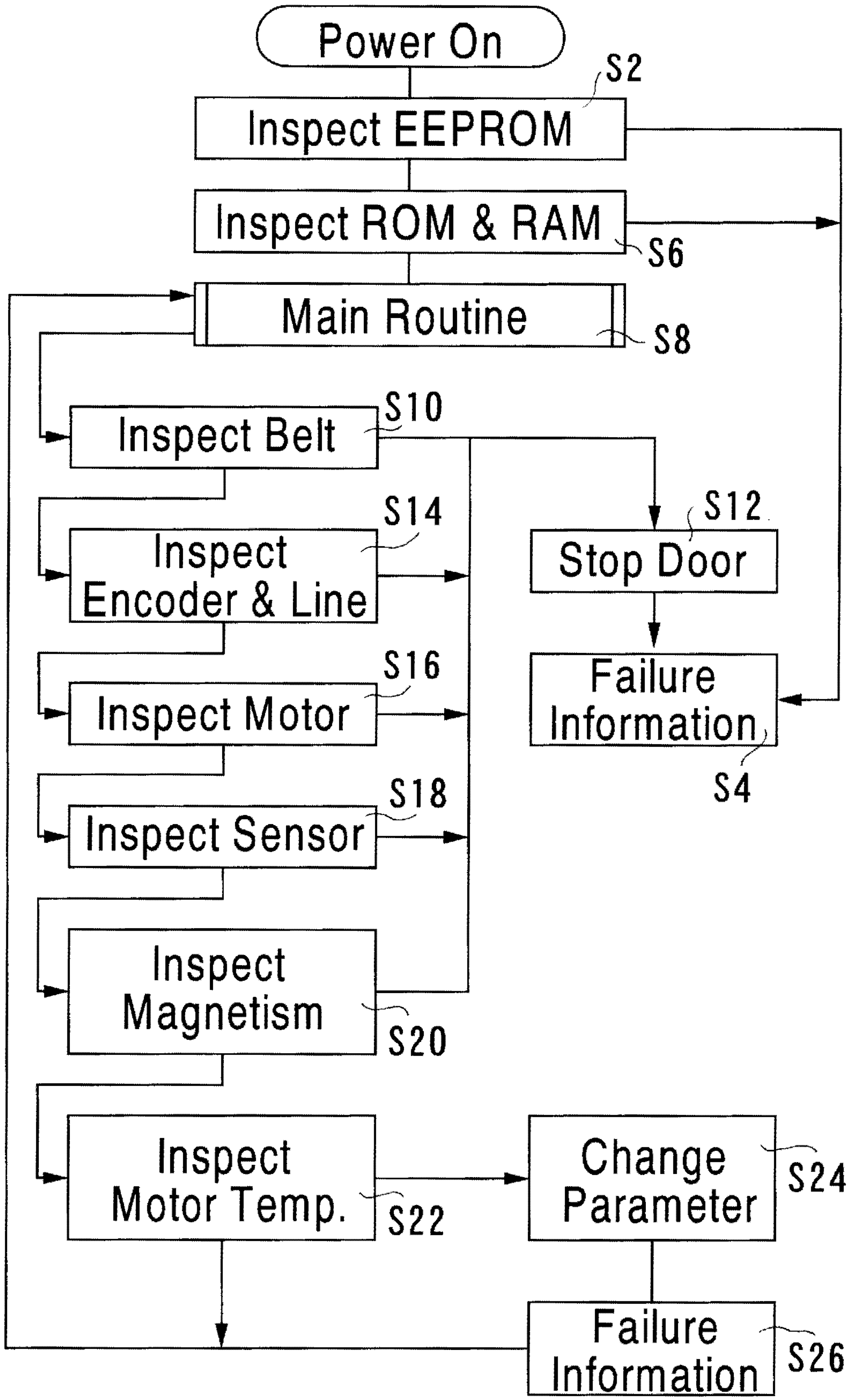
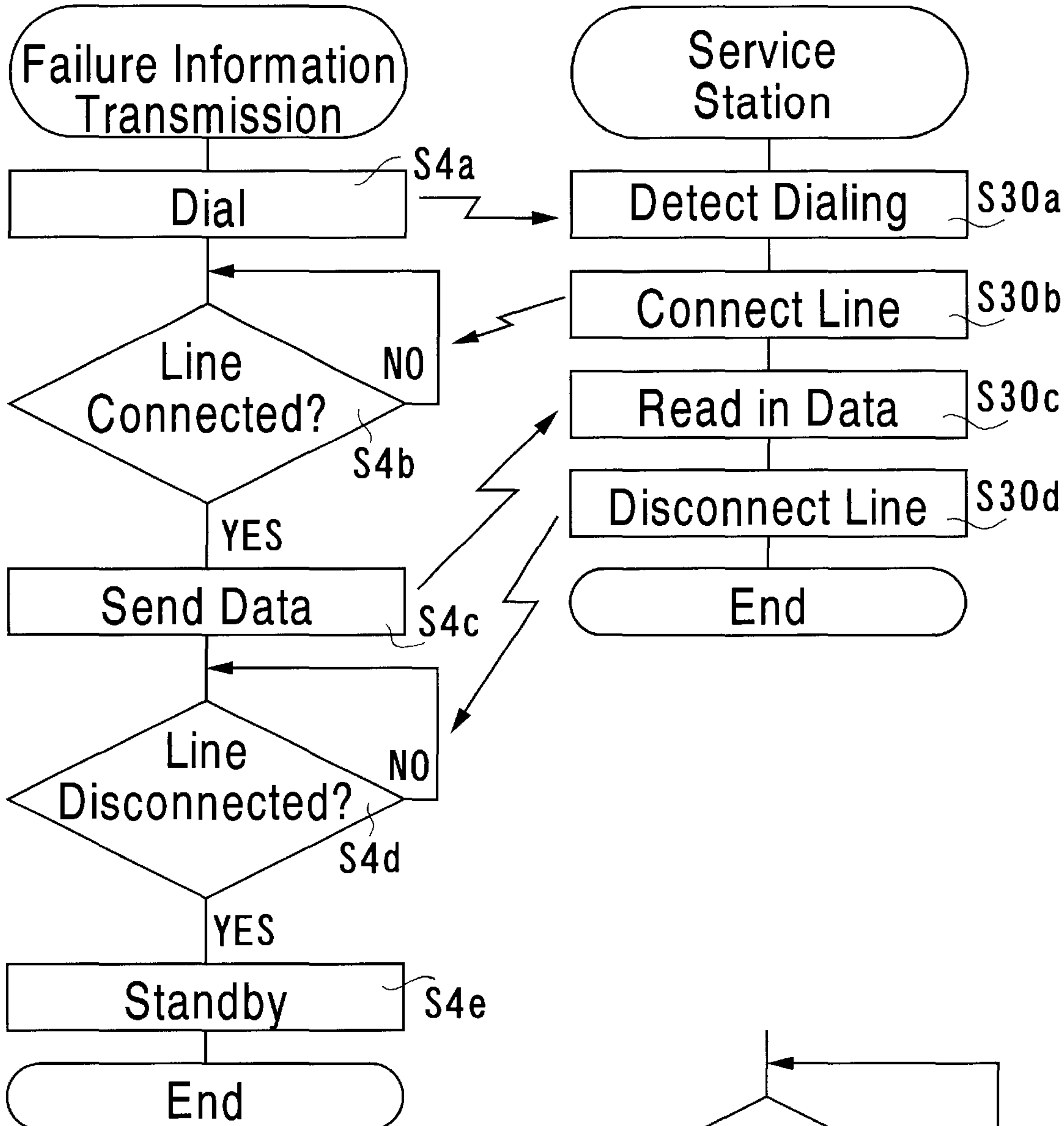
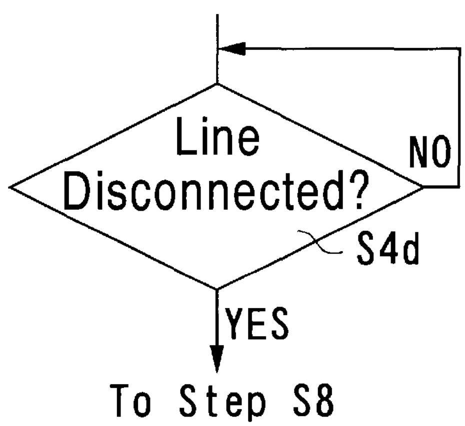

Power On
Inspect EEPROM
S2
Inspect ROM & RAM
S6
Main Routine
S8
Inspect Belt
S10
Stop Door
S12
Inspect Encoder & Line
S14
Failure Information
S4
Inspect Motor
S16
Inspect Sensor
S18
Inspect Magnetism
S20
Inspect Motor Temp.
S22
Change Parameter
S24
Failure Information
S26

FIG. 3



Failure Information Transmission
Dial
S4a
Line Connected?
NO
S4b
YES
Send Data
S4c
Line Disconnected?
NO
S4d
YES
Standby
S4e
End
Service Station
Detect Dialing
S30a
Connect Line
S30b
Read in Data
S30c
Disconnect Line
S30d
End

FIG. 4A



Line Disconnected?
NO
S4d
YES
To Step S8

FIG. 4B

Code Type	Content
ID Code	Identification of Door System
Failure Code	Identification of Failure
State Code	Operating State

FIG. 5

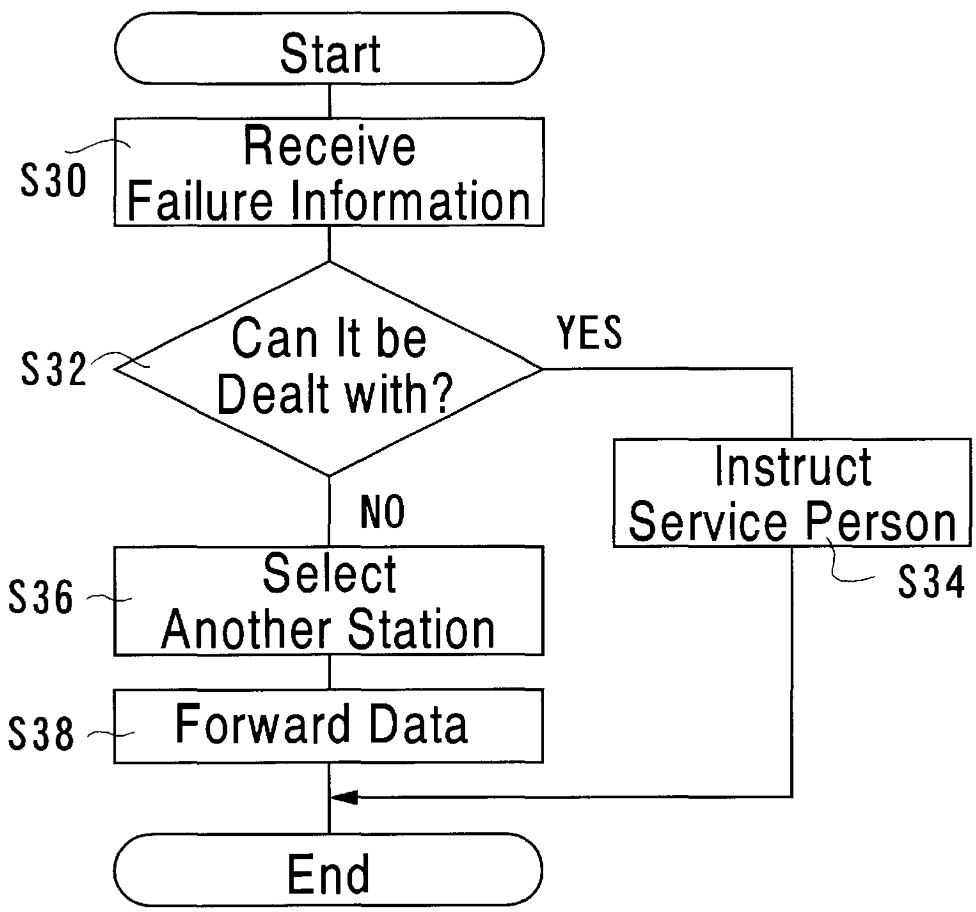


FIG. 9

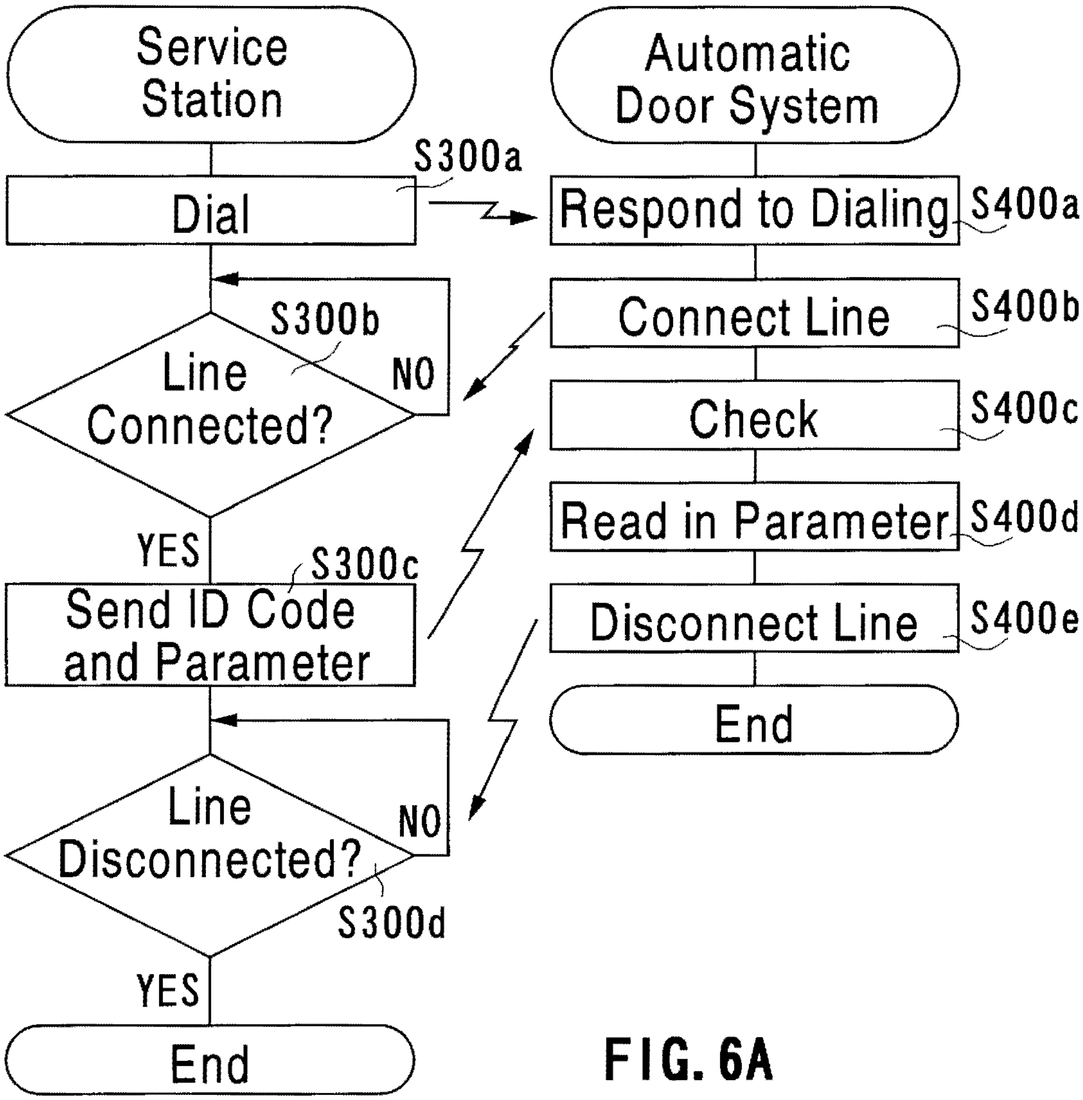

Service Station
Automatic Door System
S300a
Dial
Respond to Dialing
S400a
Connect Line
S400b
S300b
Line Connected?
NO
YES
Check
S400c
Read in Parameter
S400d
S300c
Send ID Code and Parameter
Disconnect Line
S400e
End
Line Disconnected?
NO
S300d
YES
End

FIG. 6A

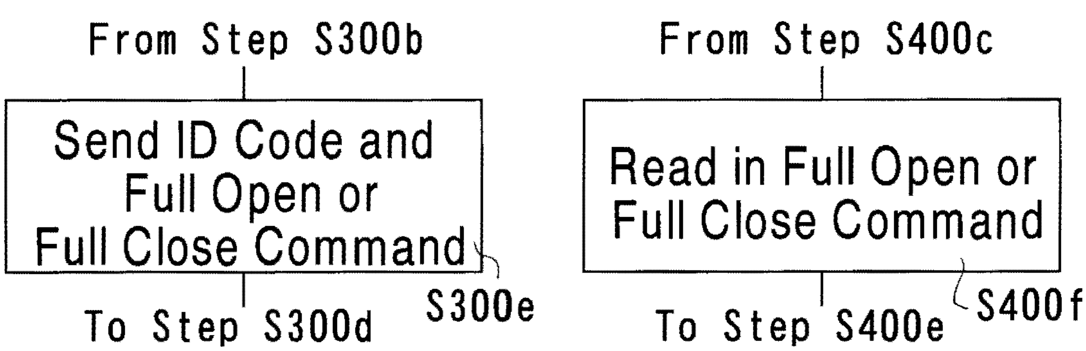
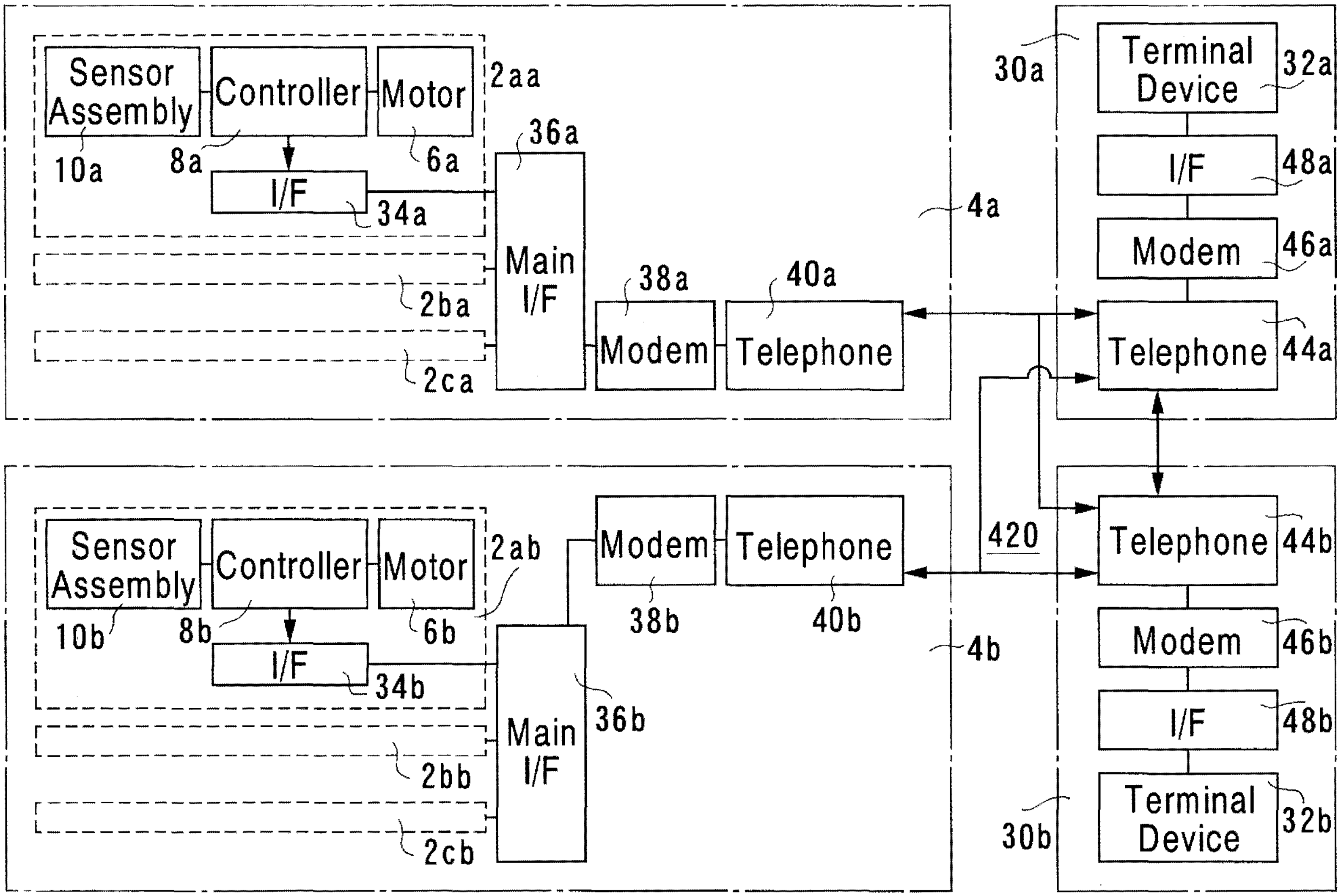

From Step S300b
Send ID Code and Full Open or Full Close Command
S300e
To Step S300d
From Step S400c
Read in Full Open or Full Close Command
S400f
To Step S400e

FIG. 6B



Sensor Assembly
Controller
Motor
2aa
10a
8a
6a
I/F
34a
36a
Main I/F
2ba
2ca
38a
40a
Modem
Telephone
4a
30a
Terminal Device
32a
I/F
48a
Modem
46a
Telephone
44a
Sensor Assembly
Controller
Motor
2ab
10b
8b
6b
I/F
34b
Main I/F
36b
2bb
2cb
Modem
Telephone
38b
40b
4b
420
Telephone
44b
Modem
46b
I/F
48b
Terminal Device
32b
30b

FIG. 7

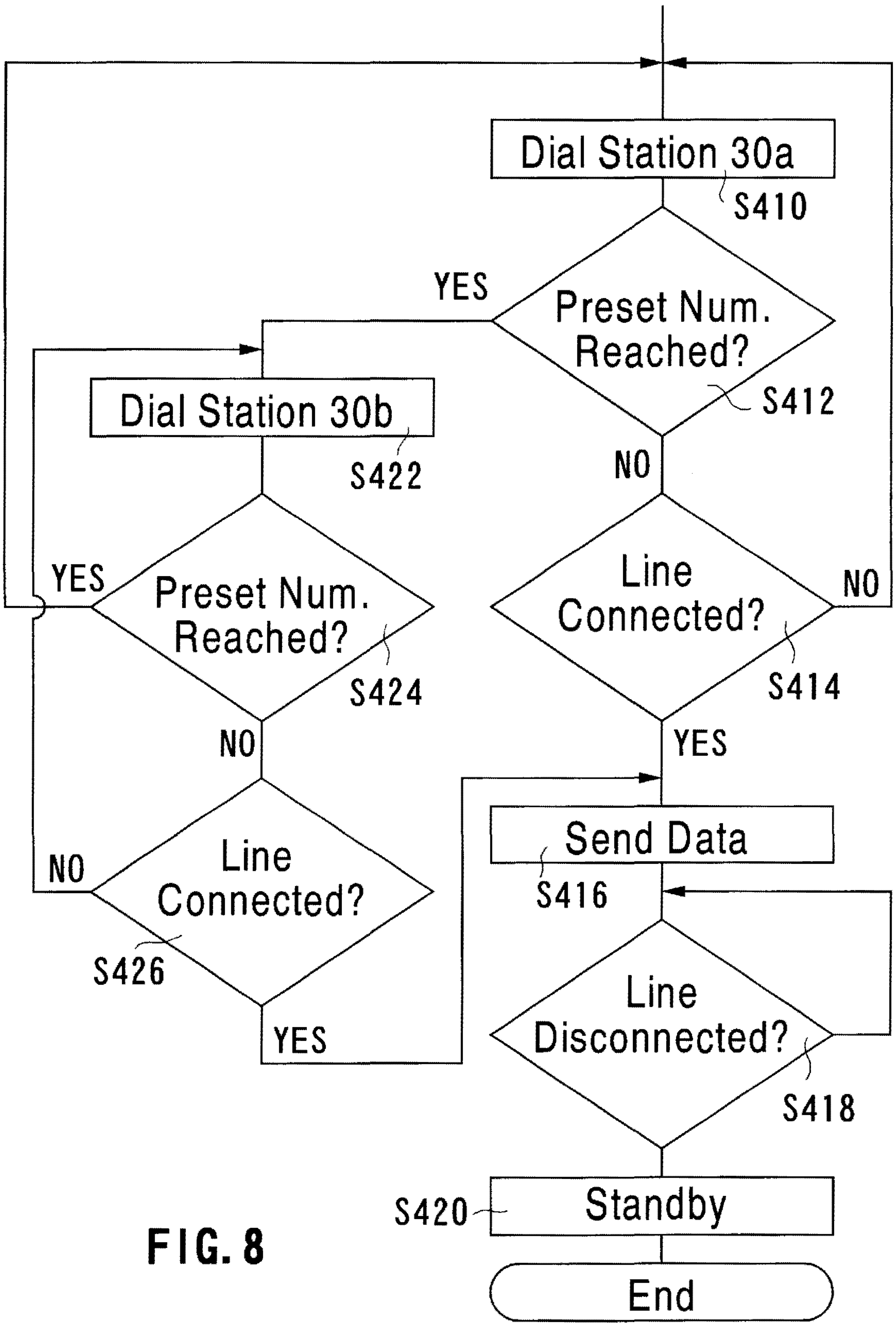

Dial Station 30a
S410
Preset Num. Reached?
S412
YES
NO
Line Connected?
S414
NO
YES
Send Data
S416
Line Disconnected?
S418
Standby
S420
End
Dial Station 30b
S422
Preset Num. Reached?
S424
YES
NO
Line Connected?
S426
NO
YES

FIG. 8

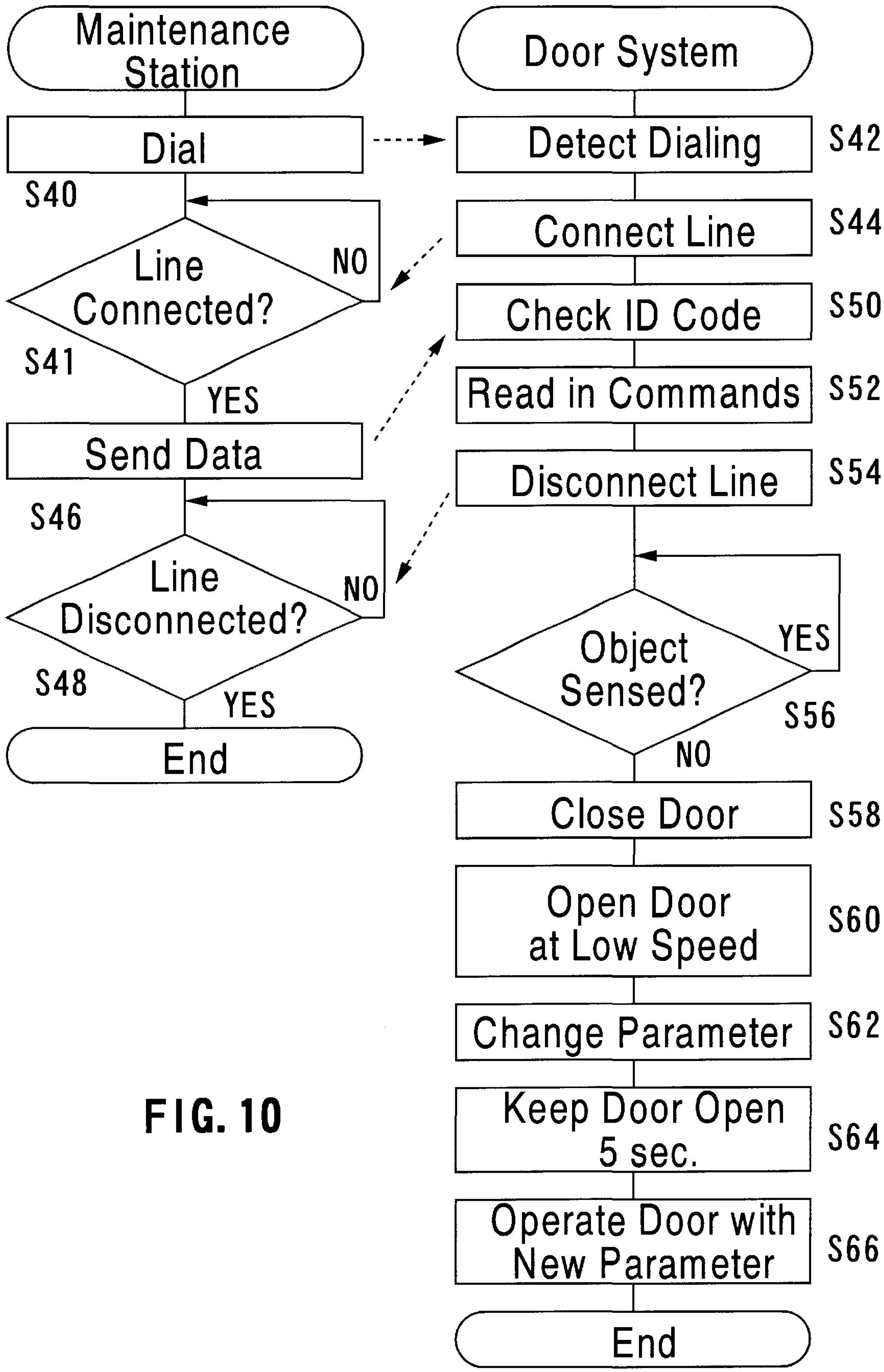

Maintenance Station
Dial
S40
Line Connected?
NO
S41
YES
Send Data
S46
Line Disconnected?
NO
S48
YES
End
Door System
Detect Dialing
S42
Connect Line
S44
Check ID Code
S50
Read in Commands
S52
Disconnect Line
S54
Object Sensed?
YES
S56
NO
Close Door
S58
Open Door at Low Speed
S60
Change Parameter
S62
Keep Door Open 5 sec.
S64
Operate Door with New Parameter
S66
End

FIG. 10

REMOTE MONITORING SYSTEM FOR AUTOMATIC DOOR SYSTEMS

This application is based on Japanese Patent Application No. HEI 10-64210 filed on Feb. 27, 1998, which is incorporated herein by reference.

This invention relates to a system for monitoring automatic door systems at remote locations.

BACKGROUND OF THE INVENTION

An automatic door system includes a motor for driving a door to open and close, and a sensor for detecting whether or not any object is present near the door. Also, it includes a controller for causing the door to be opened when the sensor senses an object and for causing the door to be closed when the sensor senses no object. If the automatic door fails, a sales agent may be called to repair it. The sales agent must find a maintenance man or maintenance women (hereinafter referred to simply as maintenance man) available at that time to send him to inspect the automatic door system. It may sometimes need a relatively long time for the sales agent to find out an available maintenance man and send him to the location where the door system is installed. The maintenance man must inspect parts of the automatic door system one by one to find malfunctioning parts. To locate malfunctioning parts also takes a relatively long time.

Japanese Unexamined UM Publication No. SHO 63-83384 published on Jun. 1, 1988 discloses a system for inspecting an automatic door system to find failures and, if failures are found, notifying it to a service agent.

The system disclosed in the Japanese UM publication notifies a service agent of some abnormal states of the automatic door system, such as a state in which the door is continuously kept closed or opened. Since there are various causes for which the door is continuously opened or closed, the service agent cannot determine, from the information obtained by the system, which parts of the door system fail. Accordingly, it may take a relatively long time for a maintenance man, who is sent to repair the door system, to locate the malfunctioning part. Thus, the system of the Japanese UM publication does not much facilitate prompt repair of the automatic door system.

When an automatic door system is installed, the door opening and closing speeds and other operating parameters are set. Sometimes, the owner of the door system may request that the door opening and closing speeds set when the door is installed be changed. In such a case, too, a maintenance man is sent to the location where the door system is installed. Sending a maintenance man for making such change makes prompt maintenance impossible.

An object of the present invention is to provide a system for monitoring automatic door systems from a remote location, which can facilitate prompt repairs of the automatic door system and prompt modification of parameters of the door system.

SUMMARY OF THE INVENTION

An automatic door remote monitoring system according to the present invention is adapted to monitor a plurality of automatic door systems from a remote location, e.g. a maintenance station which monitors and maintains such plural automatic door systems. Each door system has a control unit which includes a controller and self-diagnosing means. The controller controls the operation of the door system associated therewith, and the self-diagnosing means operates, in conjunction with the controlling of the door by

the controller, to inspect the door system to find out a malfunctioning or broken part thereof. When any one of the door systems fails, the self-diagnosing means of that door system sends to the maintenance station, through a communications system, failure information including door system part identifying information indicating a malfunctioning or broken part of that door system (hereinafter referred to simply as door system part identifying information). Also, the failure information includes door system identifying information identifying the door system to which each self-diagnosing means belongs.

When any of the automatic door systems fails, the self-diagnosing means of the failing door system sends the above-described failure information including door system part identifying information and door system identifying information to the maintenance station through the communications system. Thus, a person at the maintenance station can determine and advise a maintenance man which one of the automatic door systems is failing and which a part of that door system is malfunctioning or broken, at substantially the same time that part fails. Since a part which has failed has been determined, the maintenance man can prepare for the expected necessary repairs before he leaves the maintenance station, and, therefore, repairs of the door system can be done in a relatively short time.

In addition to the above-described door system part identifying information and door system identifying information, the failure information may include information of door operation relating to the diagnosis made by the self-diagnosing means. The door operation information is such information that the maintenance man can determine how the door system should be repaired, by studying the information together with the above-described door system part and door system identifying information. For example, the door operation information may be information about the door position where the door has stopped, parameter information about a door operation parameter, such as a door opening speed and a door closing speed, and maintenance information. The maintenance information may include information indicating how many times the door has been opened and closed before the failure occurred, and how many times the door system has been stopped due to external causes.

Since the self-diagnosing means sends, in addition to the door system part identifying information and the door system identifying information, the door operation information to the maintenance station, the maintenance man can know what should be repaired and how it should be repaired before he leaves the maintenance station. Accordingly, he can make enough preparations for the expected repairs and, therefore, promptly remove the failure.

The above-described failure information may be sent to a plurality of maintenance stations through a communications system. In such a case, failure information relating to failure of a door system received by one of the maintenance stations may be forwarded to another maintenance station. The failure information which may be forwarded to another maintenance station may include, for example, the door system identifying information indicating which one of the door systems fails, the door system part identifying information indicating which part of the malfunctioning door system fails, and the door operation information.

It may occur that no maintenance men are available at that maintenance station at the time when failure of one door system is notified to the maintenance station. For example, door failure information may be sent at night when all maintenance men have been home. If such information is sent to a maintenance station in daytime, it may happen that no maintenance men are available at that time. Even in such a case, a maintenance man must be sent to the door system from which the information was sent. Accordingly, the information is forwarded from the station where the information has been received but no maintenance men are available, to a maintenance station where a maintenance man is available, so that the door system can be repaired soon.

The self-diagnosing means of a door system which has failed may fail to communicate with one of a plurality of maintenance stations. In such a case, it may send the door failure information to other one of the maintenance stations.

The communications system may use, for example, public telephone lines. If the telephone line to one maintenance station is busy, the information cannot reach that station. Then, the self-diagnosing means of the malfunctioning door system sends the door failure information to another maintenance station, from which a maintenance man can be sent to the door system for repairing it.

The door operation information relating to the failure detected by the self-diagnosing means may be door-position indicating information indicating the door position where the detected failure has occurred.

If the door operation information is door-position indicating information, a maintenance man can know, even when he is still at the maintenance station, at which position the door has stopped, the fully closed position, the fully open position or an intermediate position between the fully closed and open positions. Then, the maintenance man can send a direction to a door caretaker, who takes care of that door system, to, for example, open the door by hand if the door is closed or partly open, so that passengers can pass through the door smoothly. If the door is fully opened or partly closed, the door caretaker can be directed to manually close the door to thereby prevent burglary at night.

Depending on the malfunctioning or broken part, the self-diagnosing means may make the control unit stop the door operation or change the door operating parameter, in addition to sending door failure information to a maintenance station. The door operating parameter may be, for example, a door moving speed.

Depending on the malfunctioning part, the automatic door system should be stopped. If the door is not stopped, the door system may become irreparable. In some cases, failure of some part may not require the automatic door system to be stopped. But the failure may be of such a nature that, if the door system is continuously operated with the current door operating parameter, the door system may become irreparable. For example, if the automatic door is opened and closed repetitively, without repairing some malfunctioning part, the motor which drives the door to open and close may be overheated and burnt. To avoid such situation, the self-diagnosing means sends information indicating the malfunctioning part and, in addition, causes the door to stop or modifies some operating parameter(s). This may delay deterioration of the door.

According to another aspect of the present invention, an automatic door monitoring system is adapted to monitor a plurality of automatic door systems at remote locations. Each of the door systems includes a control unit. The control unit includes a controller for controlling the respective doors, and self-diagnosing means, which operates, in conjunction with the control being provided by the controller, to detect a malfunctioning or broken part. When the automatic door system operates abnormally, the self-diagnosing means of the door system sends door system part identifying information to a maintenance station through a communications system, and then, the maintenance station sends a command to change the manner of operation of the door to the control unit of the door system to which the self-diagnosing means belongs.

The command for changing the manner of operation of the automatic door may be a command to lower the moving speed of the automatic door, a command to make the door fully opened or a command to make the door fully closed.

As described above, if the door system continues to operate, with its broken or malfunctioning part not repaired, the door system may become irreparable, depending on the broken part. In order to avoid it, a maintenance station which has received failure information sends a command to change the manner of operation of the door to the door system which has sent the failure information to that maintenance station. In response to the command, the manner of operation of the door of the malfunctioning door system is changed so that the failure cannot be worsened.

Lowering the door moving speed can prevent overheat and, hence, burned-out of the motor. If the door is brought to the fully opened or closed position, it is kept in that position or, in other words, it is kept unmoving, and, therefore, the failure does not worsen. Further, people approaching the door can know that the door is out of order since the door is kept open or closed.

An automatic door remote monitoring system according to another aspect of the invention is adapted to monitor a plurality of automatic door systems at remote locations. In accordance with instructions given by the door caretaker of an automatic door system, a maintenance station sends a command to a control unit of an automatic door of the automatic door system to change an operating parameter of the door.

When an automatic door system is installed, the operating parameters, such as the door opening and closing speed, are usually set by a maintenance man. However, the owner or caretaker of the door system may wants to change the set operating parameters later, considering the number of passengers and other factors. In such a case, the door owner can order a maintenance station to send a command to change a door operating parameter. Thus, the maintenance of the door system can be made promptly without need for sending a maintenance man to the location where the door system is installed.

In addition to the door operating parameter changing command, a command to cause the door to operate temporarily in a predetermined special manner may be sent. Seeing the door operate in the predetermined manner, the door owner can know that the required door operating parameter has been changed.

When the control unit of the door system receives the command to change the door operating parameter, it causes the door to temporarily operate in the predetermined special manner. The command for the predetermined special manner of the door operation may be sent from a maintenance station or may be stored in the automatic door system itself.

The predetermined special operation of the door takes place temporarily after the command to change the door operating parameter is received. Therefore, the reception of the door operating parameter changing command can be confirmed in the automatic door system side, and it can be understood that the change of the operating parameter of the door will be made after the predetermined special operation of the door takes place.

Each of the automatic door systems may include an object sensor for sensing an object approaching the door. The control unit changes the door operating parameter when no object is being sensed by the object sensor. In other words, the door operating parameter is changed when no passenger is near the door, whereby collision of the door with a passenger can be avoided.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a monitoring system for monitoring automatic door systems at remote locations according to a first embodiment of the present invention.

FIG. **2** is a detailed block diagram of a control unit and peripheral devices shown in FIG. **1**.

FIG. **3** is a flow chart showing the operation of the automatic door remote monitoring system.

FIG. **4**A and FIG. **4**B show a flow chart of a failure information transmitting operation of the control unit and a flow chart of a failure information receiving operation of a terminal device at a maintenance station.

FIG. **5** shows data transmitted in the failure information transmitting operation shown in FIG. **2**.

FIG. **6**A and FIG. **6**B show flow charts of the operation of an automatic door remote monitoring system according to a second embodiment of the present invention.

FIG. **7** is a block diagram of an automatic door remote monitoring system according to a third embodiment of the present invention.

FIG. **8** is a flow chart of failure information transmitting operation of the automatic door remote monitoring system shown in FIG. **7**.

FIG. **9** shows steps taken by a person at a maintenance station according to the embodiment shown in FIG. **7**.

FIG. **10** shows flow charts of operations of an automatic door system and a terminal device of an automatic door remote monitoring system according to a fourth embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

As shown in FIG. **1**, an automatic door remote monitoring system according to a first embodiment of the present invention monitors a plurality, e.g. three, of automatic door systems **2***a*, **2***b* and **2***c* installed at locations remote from the monitoring system. The door systems **2***a*, **2***b* and **2***c* may be installed at different locations in a building **4**.

Each of the automatic door systems **2***a*, **2***b* and **2***c* has an automatic door or door panel which selectively opens and closes a doorway formed in a wall of the building **4**. Since all of the door systems **2***a*, **2***b* and **2***c* may have the same structure, only the automatic door system **2***a* is described hereinafter, but the same description is applicable to the remaining door systems.

The door system **2***a* also includes a motor **6** for driving the door through a transmission mechanism (not shown) including a belt, and a control unit **8** for controlling the motor **6**. The motor **6** may be a three-phase brushless motor.

The automatic door system **2***a* also has an assembly of sensors **10** for sensing an object, e.g. a human, in an area near the door system **2***a*. In the normal state, the door is closed, i.e. it is in the fully closed position. If any one of a plurality of sensors of the sensor assembly **10** senses an object, the control unit **8** causes the motor **6** to rotate in a predetermined direction to thereby open the door, and when none of the sensors becomes to sense the object, the control unit **8** causes the motor **6** to rotate in the opposite direction to thereby close the door. Each of the sensors may be an optical sensor which includes a light-emitter and a light-receiver.

As is seen from FIG. **2**, the control unit **8** includes a microprocessor unit (MPU) **12**, which, in turn, includes a CPU **14**, a non-volatile memory, e.g. ROM **16**, and a volatile memory, e.g. RAM **18**. The control unit **8** also includes a writable, non-volatile memory, e.g. EEPROM **20**, and a motor driver **22**. The ROM **16**, the RAM **18**, the EEPROM **20** and the motor driver **22** are all connected to the CPU **14**.

The motor driver **22** includes a motor current detector **23** for detecting current flowing through the motor **6** and producing a current representative signal representative of the detected current. The current representative signal is applied to the CPU **14**. A motor rotation detector, e.g. encoder (E) **24**, is disposed in association with the motor **6**, for detecting the rotation rate of the motor **6** and generating a rotation rate representative signal, which is applied to the CPU **14**. A temperature detector (TD) **26** detects the temperature of the motor **6** and generates an overheat signal when the temperature of the motor **6** exceeds a predetermined temperature.

In accordance with programs stored in the ROM **16**, the CPU **14** controls the door, self-diagnoses or inspects the automatic door system for failure and communicates with a maintenance station, and, in order to temporarily store data to be used therefor, the RAM **18** is used. The EEPROM **20** has stored therein various operating parameters and data to be used in inspecting the automatic door system.

The motor driver **22** causes the motor **6** to rotate in the direction and at the rotation rate as instructed by the CPU **14**. The output of the encoder **24** associated with the motor **6** is applied to the CPU **14**, which is used to feedback control the motor **6** and to detect the current position of the door.

The CPU **14** inspects the door system, i.e. makes self-diagnosis, in accordance with programs stored in the ROM **16**. The CPU **14** inspects the door system for failures, such as failures in the EEPROM **20**, the ROM **16** and the RAM **18**, breakage of the belt, disconnection of lines interconnecting the encoder **24** and the CPU **24**, abnormality of the motor current, failure of any one of the sensors in the sensor assembly **10**, abnormality of the magnetism of the motor **6**, and overheating of the motor **6**. An example of the manner of conducting the inspection is disclosed in Unexamined Japanese Patent Publication No. HEI 10-46918 published on Feb. 17, 1998, which corresponds to U.S. patent application Ser. No. 08/857,035 entitled “AUTOMATIC DOOR SYSTEM WITH SELF-DIAGNOSING FUNCTION” filed on May 15, 1997 by H. Kanki and N. Taguchi and assigned to the same assignee as the present application, which is incorporated herein by reference. The inspection of the automatic door system may be done in a way different from the one disclosed in this U.S. patent application.

The inspection of the EEPROM **20**, the ROM **16** and the RAM **18** is carried out by writing and reading data into and from them and determining whether written data can be correctly read out. Whether or not the motor current is normal can be determined from the output of the motor current detector **23**. Whether or not the motor **6** is overheated is determined from the output of the temperature detector **26**. The breakage of the motor belt, the disconnection of the encoder lines and the magnetic force abnormality can be known from the output of the encoder **24**.

Each sensor in the sensor assembly **10** includes also a CPU, a ROM and a RAM, and the CPU executes a program to inspect the sensor for failure. The result of inspection is sent to the CPU **14**.

When the CPU **14** judges, in accordance with the result of the self-diagnosis of the door system, that some part fails to operate or malfunctions, the CPU **14** transmits the result of the self-diagnosis to a terminal device **32** at a maintenance station **30** shown in FIG. **1**. The maintenance station may be, for example, a sales company that sold the automatic door systems **2***a*–**2***c*.

For that purpose, the door system has an interface circuit (I/F) **34**. The interface circuits **34** of the door systems **2***a*–**2***c* are connected to a main interface circuit (I/F) **36**, which, in turn, is connected to a modem **38**. The modem **38** is connected to a telephone set **40**. The telephone **40** can communicate with a telephone set **44** at the maintenance station **30** via a public telephone line.

The telephone set **44** at the maintenance station **30** is connected to a modem **46**, which, in turn, is connected to the terminal device **32** through an interface circuit (I/F) **48**.

Thus, the control unit **8** is capable of communicating with the terminal device **32** through a communications system including the interface circuits **34** and **48**, the main interface circuit **36**, the modems **38** and **46**, the telephone sets **40** and **44** and the public telephone line **42**.

The terminal device **32** may have a structure similar to the control unit **8** and include a CPU, a ROM, a RAM etc., but it does not self-diagnose or control a door.

FIG. **3** shows, in the form of a flow chart, a program executed by the CPU **14** of the control unit **8** of the automatic door system **2***a*.

When the door system **2***a* is powered on, the CPU **14** inspects the EEPROM **20** for failure (Step S**2**). If it is judged that the EEPROM **20** fails or malfunctioning, failure information is transmitted as will be described later (Step S**4**).

On the other hand, if it is judged that the EEPROM **20** is operating normally, the ROM **16** and the RAM **18** are inspected for failure (STEP S**6**). If it is judged that the RAM **18** is not operating properly, failure information is transmitted (STEP S**4**).

If the RAM **18** is judged to have no failure, the ROM **16** is inspected. If it is judged that the ROM **16** is not operating properly, failure information is transmitted (Step S**4**).

If the EEPROM **20**, the RAM **18** and the ROM **16** have been judged to be operating properly, a main routine is executed (Step S**8**). In the main routine, commands are sent to the motor driver **22** to open the door when a sensor in the sensor assembly **10** detects an object, and to close the door when the object goes out of the sensing area of the sensor assembly and, therefore, is no longer detectable.

After the main routine is executed, the belt is inspected for breakage of the belt (Step S**10**). If it is judged that the belt is broken, a command is sent to the motor driver **22** to stop the operation of the door (Step S**12**), and the processing advances to Step S**4** in which failure information is transmitted. The door is stopped because, if the motor **6** continues to rotate with the belt broken, it may also be damaged. The door is stopped for the same reason when another failure discussed later is detected.

If, on the other hand, it is judged that the belt is not broken, the encoder **24** and the line led from the encoder **24** are inspected for any defects therein (Step S**14**). If the encoder **24** or the line from it contains a failure, Step S**12** and Step S**4** are executed to make the door stop moving and to send failure information.

If, on the other hand, it is judged that both the encoder **24** and the line therefrom contain no failure, the current flowing in the motor **6** is inspected (Step S**16**). If the motor current is judged abnormal, the door is stopped (Step S**12**) and failure information is transmitted (Step S**4**).

If the motor current is judged normal, the processing advances to Step S**18** where the sensors are inspected. In this Step S**18**, it is judged if any sensor in the sensor assembly **10** is sending a failure-indicative signal. If the failure-indicative signal is sent, Steps S**12** and S**4** are executed.

If no failure-indicative signal is sent from any of the sensors, the magnetism of the motor **6** is inspected next (Step S**20**).

If the magnetic property of the motor **6** is judged abnormal, Steps S**12** and S**4** are executed. If the magnetism of the motor **6** is judged normal, the temperature of the motor **6** is inspected (Step S**22**).

Each time the door opens or closes, current flows through the motor **6**, so that the motor **6** generates heat. If the motor **6** is operating normally, the temperature of the motor does not exceed a given temperature. As stated previously, if the temperature of the motor **6** exceeds the given temperature, an overheat signal is developed by the temperature detector **26**. If the overheat signal is being generated, the CPU **14** judges that the motor **6** is malfunctioning. If the overheat signal is not generated, the CPU **14** judges that the motor **6** is operating normally.

If the motor **6** is judged to be normally operating, the processing returns to Step S**8**, and the automatic door control and the inspection stated above are performed.

On the other hand, if it is judged that there is some fault in the motor **6**, a parameter is changed (Step S**24**). For example, a parameter which determines the door moving speed is changed to lower the door moving speed from the preset speed so that the loading on the motor **6** can be reduced. The reduction of loading on the motor **6** makes it possible to open and close the automatic door, while preventing such a fatal failure of the motor **6** that may make the door unmovable. After that, failure information is transmitted (Step S**26**). It should be noted that the processing of Step S**26** is different from the processing of Step S**4**, as will be described later.

FIG. **4**A shows a flow chart of the failure information transmission procedure in Step S**4** and procedures the terminal device **32** of the maintenance station **30** performs in response to the received failure information.

In the failure information transmission Step S**4**, the modem **46** at the maintenance station **30** is dialed (Step S**4***a*). The CPU **14** sends a command through the interface circuit **34** and the main interface circuit **36** to the modem **38** to dial the modem **46** at the maintenance station **30**. Then, the modem **38** dials the modem **46** through the telephone **40**, the public telephone line **42** and the telephone **44**.

At the maintenance station **30**, the modem **46** detects the dialing from the modem **38** and informs the terminal device **32** of it (Step S**30***a*). The terminal device **32** commands the modem **46** to connect with the line, and the modem **46** connects itself with the modem **38** (Step S**30***b*).

After the processing of Step S**4***a*, the CPU **14** repeatedly makes a judgment as to whether or not the connection has been completed (Step S**4***b*). When the connection is completed, transmission of data or failure information starts (Step S**4***c*). The failure information to be transmitted contains an ID code, a failure code and a state code, as shown in FIG. **5**.

The ID code is a code assigned to each of the door systems **2***a*, **2***b* and **2***c* to individually identify the door systems. The maintenance station **30** can determine the malfunctioning automatic door system from the received ID code.

The failure code is a code representing the respective self-diagnosis made by the CPU **14**. The maintenance station **30** can determine the malfunctioning door system parts from the received failure code.

The state code contains information about the operating state of the automatic door when the detected failure occurs. The information can be used at the maintenance station **30** to determine how to service the door. For example, it can be used to determine whether or not the malfunctioning part should be replaced by a new one. Particularly, the state information includes information of the position of the door where it has stopped, values of various operating parameters, maintenance information about the maintenance which has been provided for the automatic door, etc.

The maintenance information contains information as to how many time the door has been opened and closed since the last maintenance, how many time the door has stopped moving due to external causes, such as collision of a human with the door and intrusion of a pebble in the gap between the door bottom and the floor, how many time the maintenance has been provided for the door since its installation, how many times the CPU **14** has been reset due to runaway of the CPU **14**, how many times the parameters have been changed due to rising of the motor temperature, etc.

The transmitted data is read into the terminal device **32** at the maintenance station **30** (Step S**30***c*). Then, the terminal device **32** sends a command to the modem **46** to disconnect from the telephone line, and the modem **46** is disconnected from the modem **38** (Step S**30***d*).

After sending the failure information, the CPU **14** repeatedly makes judgment as to whether the telephone line has been disconnected or not (Step S**4***d*), and then, places itself in a standby state when the disconnection is completed (Step S**4***e*). As a result, the door is maintained in an unmovable state, in which it has been placed in Step S**12**. The door is kept unmovable until a maintenance man finishes repairs of the malfunctioning part.

Transmission of failure information done in Step S**26** is generally the same as the processing described with reference to FIG. **4**A. It is, however, slightly different, as shown in FIG. **4**B, in that if it is judged that the line is disconnected in Step S**4***d,* the processing does not enter into the standby state of Step S**4***e,* but it advances to perform the main routine in Step S**8**. The failure information sent in Step S**26** is to inform that the motor **6** generates heat in an abnormal way. In this case, a parameter has been changed in Step S**24** so that the automatic door can continue to operate. This is the reason why the processing does not advance to Step S**4***e,* but returns to Step S**8**.

In the automatic door monitoring system of the described embodiment, the control units **8** of the automatic door systems change parameters and/or stop the door from moving.

According to a second embodiment, the terminal device **32** is arranged to change operating conditions of the door, such as changing operating parameters of the door and/or stopping the door.

When the terminal device **32** is arranged to, for example, change the door moving parameter, the failure information is sent to the maintenance station **30** in Step S**26**, and the processing in Step S**24** in the flow chart shown in FIG. **3** is omitted. Instead, as shown in FIG. **6**A, the maintenance station **30** sends a new parameter etc. to the automatic door system which has sent the failure information.

The terminal device **32** of the maintenance station **30** dials the automatic door system from which the failure information is received (Step S**300***a*), and waits for the line connection (Step S**300***b*). The automatic door system which has sent the failure information responds to the dialing from the terminal device **32** of the maintenance station (Step S**400***a*) and connects the telephone line (Step S**400***b*).

When the line is connected, the terminal device **32** sends the ID code of the automatic door system which has sent the failure information and also a new parameter (Step S**300***c*) and awaits the disconnection of the line (Step S**300***d*). When the line is disconnected, the processing at the maintenance station ends.

At the automatic door system which has sent the failure information, whether or not the transmitted and received ID code is the ID code assigned to that automatic door system (Step S**400***c*). If it is, the transmitted new parameter is read in (Step S**400***d*), and the line is disconnected (Step S**400***e*). After that, the automatic door system operates in accordance with the read-in new parameter.

With the described arrangement of the second embodiment, in which the parameter or parameters are arranged to be sent from the maintenance station **30**, a parameter suitable for solving the current problem of the automatic door system can be chosen by the maintenance man at the maintenance station, by considering the content of the information sent in the state code from the automatic door system.

In order for the maintenance station **30** to be able to stop the door from moving, the processing of Step S**12** in the flow chart shown in FIG. **3** is omitted, and the failure information transmission is performed in Step S**4**. After that, the processing shown in FIG. **6**A, with Steps S**300***c* and S**400***d* replaced respectively by Steps S**300***e* and S**400***f* shown in FIG. **4**B, is performed.

A command, i.e. full open or full close command, to fully open or fully close the door is sent from the maintenance station **30** to the automatic door system which sent the failure information to the maintenance station **30**, so that the door of the automatic door system is fully opened or fully closed. Whether the door should be fully opened or fully closed is determined by the maintenance man at the maintenance station **30** in accordance with the content of the received state code, e.g. the position at which the failure has detected. Seeing the door staying in the fully opened or closed position, people near the door can readily know that the automatic door system is malfunctioning.

In the automatic door monitoring system according to the above-described first and second embodiments, a plurality of automatic door systems in one building send failure information to one maintenance station **30**. According to a third embodiment of the present invention, a plurality of automatic door systems of a plurality of buildings can send failure information to any one of a plurality of maintenance stations. As shown in FIG. **7**, a plurality of automatic door systems **2***aa,* **2***ba* and **2***ca* in one building **4***a* and a plurality of automatic door systems **2***ab,* **2***bb* and **2***cb* of another building **4***b* can send failure information to either of maintenance stations **30***a* and **30***b*.

Also, a terminal device **32***a* at the maintenance station **30***a* can forward failure information it has received from any one of the automatic door systems to a terminal device **32***b* at the maintenance station **30***b,* and vice versa.

The door systems **2***aa,* **2***ba,* **2***ca,* **2***ab,* **2***bb* and **2***cb* have a structure like that of the door systems **2***a,* **2***b* and **2***c* shown in FIGS. **1** and **2**, and the maintenance stations **30***a* and **30***b* have a structure like that of the maintenance station **30**.

FIG. **8** is a flow chart of the processing corresponding to Step S**4** in the flow chart shown in FIG. **3**, which, for example, one of the automatic door systems in the building **4***a* performs to send failure information to the maintenance station **30***b*. Usually, the automatic door systems of the building **4***a* communicate with the maintenance station **30***a,* but, in the case illustrated in FIG. **8**, the maintenance station **30***a* has not been accessible for some reason. For example, the telephone at the maintenance station **30***a* is busy.

First, the maintenance station **30***a* is dialed (Step **S410**). A judgment as to whether the maintenance station **30***a* has been dialed a predetermined number of time is made (Step **S412**). If the predetermined number of times of dialing has not been reached yet, a judgment as to whether or not the line is connected is made (Step **S414**). If the line has not been connected yet, Step **S410** is performed again. If it is judged that the line has been connected, the same processing of sending data, judging whether the line is disconnected, and placing the CPU **14** in the standby state, as done in Steps **S4***c,* **S4***d* and **S4***e* shown in FIG. **4**A, is performed in Steps **S416**, **S418** and **S420**.

If the maintenance station **30***a* has been dialed the predetermined number of times, i.e. if the answer to the inquiry made in Step **S412** is YES, the maintenance station **30***b* is dialed (Step **S422**). Then, a judgment is made as to whether or not the maintenance station **30***b* has been dialed a predetermined number of times (Step **S424**). If the maintenance station **30***b* has not yet been dialed the predetermined number of times, a judgment is made as to whether or not the line is connected (Step **S426**). If the line has been connected, Steps **S416**, **S418** and **S420** are executed. If the line has not yet been connected, Step **S422** is executed. When the maintenance station **30***b* has been dialed the predetermined number of times, i.e. if the answer to the inquiry made in Step **S424** is YES, Step **S410** is executed. In this way, the maintenance stations **30***a* and **30***b* are repeatedly accessed until the automatic door system can communicate with either one of them.

As described above, if an automatic door system cannot connect to a maintenance station which it used to communicate with, it can send failure information to another maintenance station. Thus, it is possible to send a maintenance man at that maintenance station to the automatic door system which has sent failure information. Thus, the automatic door system can be repaired quickly.

The processing corresponding to Step **S26** in the flow chart shown in FIG. **3**, which is performed in the automatic door systems in the building **4***a,* does not include Step **S420** of FIG. **8**, and Step **S8** for the main routine is executed after step **S418**. In the processing corresponding to Step **S4** and **S26** in the flow chart shown in FIG. **3**, which is performed in the automatic door systems in the building **4***b,* the maintenance station **30***b* is dialed in Step **S410**, and the maintenance station **30***a* is dialed in Step **S422**.

When the maintenance station **30***a,* for example, receives failure information from an automatic door system in the building **4***a,* a member of the service staff at the maintenance station **30***a* acts in accordance with the flow chart shown in FIG. **9**. When the station **30***a* receives failure information (Step **S30**), it is studied by the staff member at the maintenance station **30***a* to judge whether or not the failure can be dealt with the maintenance station **30***a* (Step **S32**). He makes this judgment, considering whether or not a maintenance man is available at the station **30***a,* and whether or not the part to be replaced for the part which he thinks may be malfunctioning is available at the station **30***a,* together with other factors. If the staff member judges that the failure can be dealt with by the station **30***a,* he chooses the maintenance man to be sent for the repair, gives the maintenance man necessary information including the identification of the door system which has failed, what failure has occurred, how it has occurred, and what parts should be taken with him, and send the maintenance man to the building **4***a* (Step **S34**).

On the other hand, if the staff member judges that the failure cannot be dealt with by the maintenance station **30***a,* he chooses another maintenance station to which the failure information should be forwarded (Step **S36**). Though only the maintenance stations **30***a* and **30***b* are shown in FIG. **7**, there may be other maintenance stations. All of the maintenance stations may have the same arrangement as the maintenance station **30** shown in FIG. **1**. The staff member at the maintenance station **30***a* selects one of such maintenance stations that he thinks is suitable to restore the malfunctioning door system. Then, the staff member operates a terminal device **32***a* to forward the failure information to the selected maintenance station (Step **S38**). Assuming that the maintenance station **30***b* has been selected. The failure information received at the maintenance station **30***a* is sent via an interface circuit **48***a,* a modem **46***a,* a telephone **44***a,* public telephone lines **420**, a telephone **44***b,* a modem **46***b* and an interface circuit **46***b* to a terminal device **32***b* of the maintenance station **30***b.*

The first through third embodiments of the present invention described above are directed to an automatic door remote monitoring system for monitoring remote door systems for failure and for dealing with such failure.

A fourth embodiment of the present invention is directed to a system which makes it possible to change the set operating parameter, e.g. the door moving speed, of the door system without need for sending a maintenance man to the location where the door system is installed. Such change may be done at the request of the building owner who is not satisfied by the preset door moving speed.

The configurations of each automatic door system and each maintenance station are the same as shown in FIGS. **1** and **2**, but the programs the CPU **14** of the control unit **8** and the terminal device **32** execute are the ones shown, for example, in FIG. **10**. The same reference numerals as used in FIG. **1** are used.

The maintenance station **30** dials, through the modem **46** and the telephone **44**, the modem **38** in the building **4** where the automatic door system in question is installed (Step **S40**) and waits for the connection (Step **S41**). The modem **38** in the building **4** detects the dialing (Step **S42**) and connects to the line (Step **S44**).

The connection to the line is detected in Step **S41**, and, then, the maintenance station **30** sends data to the automatic door system **30** (Step **S46**). The maintenance station **30**, then, awaits the disconnection from the line (Step **S48**). The data sent to the automatic door system includes the ID code of the automatic door system of which an operating parameter is to be changed, a new parameter to be replaced, and a command to temporarily operate the door in a predetermined special manner. Such command may, for example, open the door at a low speed and keep it in the open position for five seconds.

The CPU **14** in the control unit **8** for each of the automatic door systems **2***a,* **2***b* and **2***c* in the building **4** determines whether or not the ID code contained in the data sent to it via the modem **38** and the main interface circuit **36** of the building and the interface circuit **34** associated to it is the IC code assigned to that door system (Step S**50**). The CPU **14** of the automatic door system assigned with the ID code same as the ID code in the data from the maintenance station **30** reads in the command to temporarily operate the door in the special manner as well as the modified parameter (Step S**52**). Then, the line is disconnected (Step S**54**). The processing at the maintenance station **30** ends with the disconnection of the line.

After the line is disconnected, a judgment is made in the automatic door side, as to whether or not any one of the sensors in the sensor assembly **10** is sensing an object (Step S**56**). This step, Step S**56**, is repeated while an object is being sensed. When the object is no longer sensed by any of the sensors, the CPU **14** causes the automatic door to move to its fully closed position (Step S**58**). After that, the CPU **14** causes the door to move from the fully closed position to the fully opened position at a speed considerably lower than the preset opening speed (Step S**60**). The CPU **14** changes the parameter while the door is in the fully opened position (Step S**62**) and hold the fully opened state of the door for five seconds (Step S**64**).

Seeing the door move to the fully opened position at a lower speed and stay there as long as five seconds, the building owner can know that the required parameter has been changed. After that, the automatic door operates with the changed parameter (Step S**66**).

The automatic door remote monitoring system of the present invention is not limited to the above-described embodiments, but various modifications are possible. For example, in place of three-phase brushless motors, DC motors may be used as the motors **6**, **6***a* and **6***b*. In the embodiment shown in FIG. **1**, three automatic door systems **2***a*, **2***b* and **2***c* send failure information to the maintenance station **30**, but it may be arranged that more automatic door systems can send failure information to the station **30**. Furthermore, in the embodiment illustrated in FIG. **7**, only the automatic door systems installed in the two buildings **4***a* and **4***b* send failure information to the maintenance stations **30***a* and **30***b*, but it may be arranged that automatic door systems in other buildings, too, can send failure information to them. Also, the number of maintenance stations can be larger.

What is claimed is:

1. An automatic door remote monitoring system comprising:

a plurality of automatic door systems each including an automatic door and a control unit, said control unit including door control means for controlling the operation of said automatic door and self-diagnosing means for detecting a failure in components of said automatic door system, said self-diagnosing means, when detecting a failure in any of said components of the automatic door system with which said self-diagnosing means is associated, providing failure information including system identifying information identifying said associated automatic door system, malfunctioning part identifying information identifying a malfunctioning component and system state information about the malfunctioning automatic door; and

a communications system for sending said failure information from each of said control units to a maintenance station which monitors and maintains said plurality of automatic door systems;

said maintenance station determining, from said failure information sent thereto, the state of the automatic door of the automatic door system from which said failure information has been sent to said maintenance station, and sending, via said communications system, to the control unit of said automatic door system, a command to change operation of the automatic door of the automatic door system.

2. The automatic door remote monitoring system according to claim **1** wherein said system state information includes door position information about a position of said automatic door when the detected failure has occurred.

3. The automatic door remote monitoring system according to claim **1** wherein said system state information includes operating parameter information about an operating parameter of said automatic door when the detected failure has occurred.

4. The automatic door remote monitoring system according to claim **1** wherein said system state information includes maintenance information about maintenance which was provided for said automatic door system before the detected failure has occurred.

5. An automatic door remote monitoring system comprising:

a plurality of automatic door systems, each including an automatic door and a control unit for controlling said automatic door; and

a maintenance station which monitors and maintains said plurality of automatic door systems, said maintenance station sending a command to change an operating parameter of the automatic door of a particular automatic door system via a communications system to the control unit of said particular automatic door system, in accordance with a request by the owner of said particular automatic door system;

said maintenance station, when sending said command to change the operating parameter to said control unit, sending a command to cause said automatic door to temporarily perform a predetermined particular opening and closing operation so as to notify said owner of the operating parameter change;

said control unit of said particular automatic door system causing said automatic door to operate with the operating parameter as changed in response to said command, after causing said automatic door to perform said predetermined particular opening and closing operation.

6. The automatic door remote monitoring system according to claim **5** wherein each of said plurality of automatic door systems includes a sensor for sensing an object approaching the automatic door of that automatic door system, and said control unit of that automatic door system executes the command to change the operating parameter of the automatic door when said control units finds that said sensor is not sensing any object.

7. An automatic door remote monitoring system comprising:

a plurality of automatic door systems each including an automatic door and a control unit, said control unit including door control means for controlling the operation of said automatic door and self-diagnosing means for detecting a failure in components of said automatic door system said self-diagnosing means, when detecting a failure in any of said components of the automatic door system with which said self-diagnosing means is associated, providing failure information including system identifying information identifying said associated automatic door system, and malfunctioning part identifying information identifying a malfunctioning component; and a communications system for sending said failure information from each of said control units to a maintenance station which monitors and maintains said plurality of automatic door systems;

said self-diagnosing means sending said failure information to said maintenance station through said communications system, and also providing a command to change the operation of the automatic door to said door control means, the operation to be changed being dependent on a malfunctioning component of said automatic door.

8. The automatic door remote monitoring system according to claim **7** wherein said command to change the operation of the automatic door is a command to lower the moving sped of said automatic door.

9. The automatic door remote monitoring system according to claim **7** wherein said command to change the operation of the automatic door is a command to move the automatic door to the fully opened or fully closed position thereof.

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(54) **POWER DOOR CONTROL AND SENSOR MODULE FOR A WIRELESS SYSTEM**

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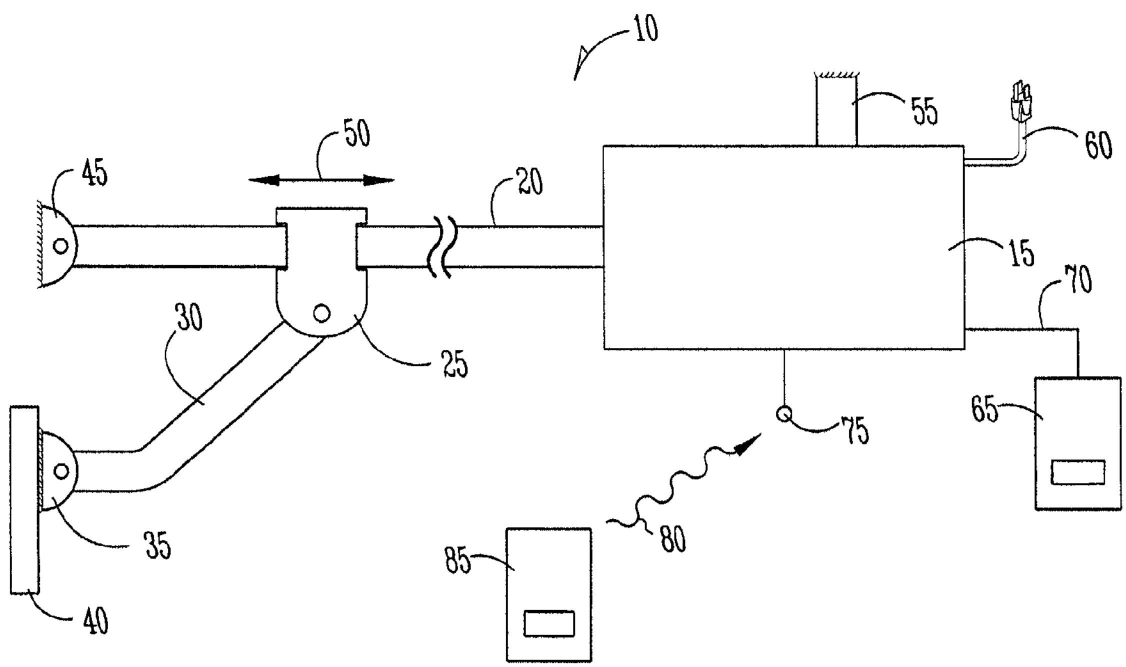
(52) **U.S. Cl.** **455/66**; 455/41

(57) **ABSTRACT**

A module with a sensor to indicate the position of a door coupled to a door opener. The module is compatible with a wireless communication protocol and operates over both a long range, such as is used with a cellular telephone, and a short range, such as is used with BLUETOOTH®. A door position sensor coupled to the module provides information to the user over a wireless communication channel. In one embodiment, information from an additional door position sensor is wirelessly transmitted. In one embodiment, an audio transducer coupled to the module responds to voice commands to operate the door opener.



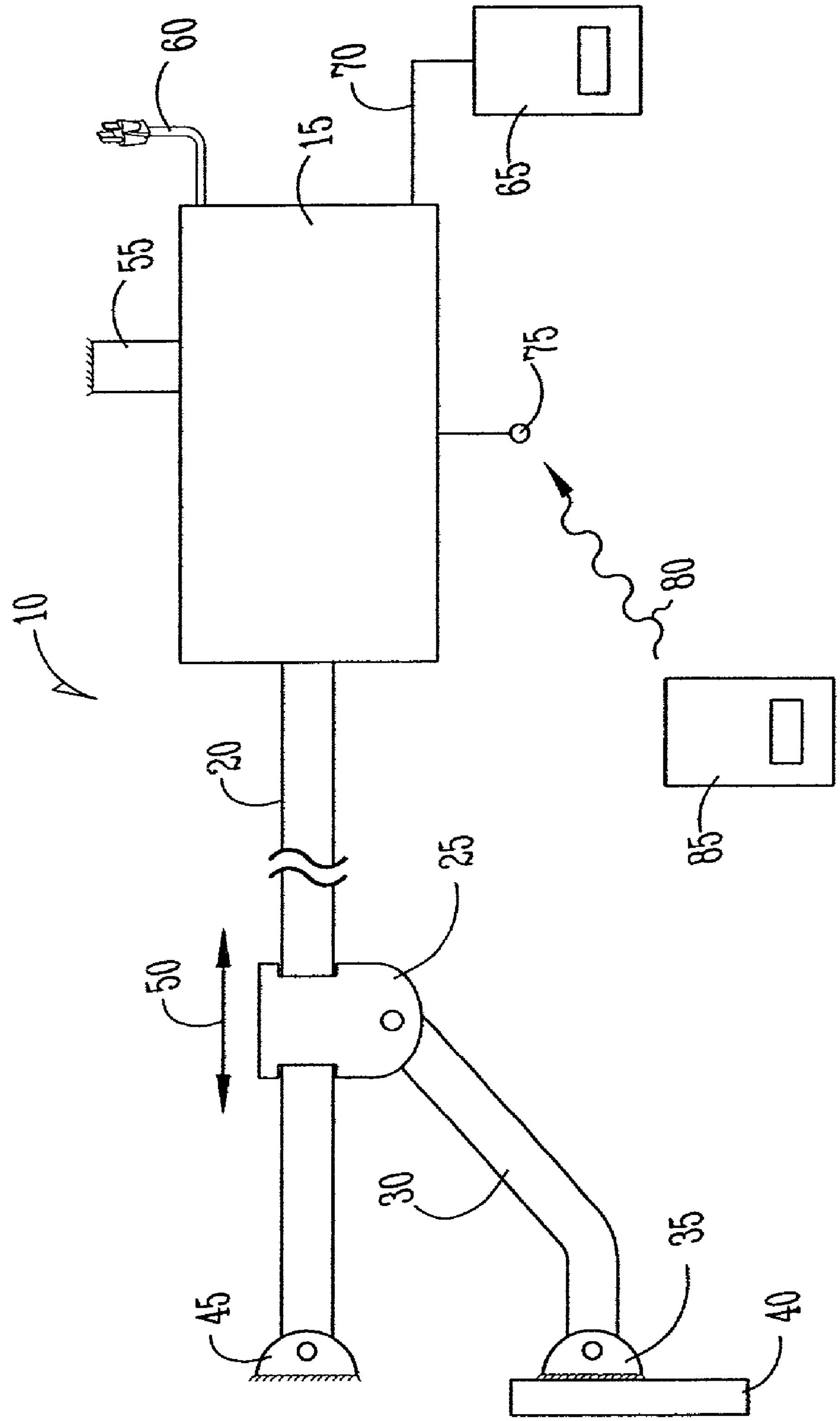


Fig. 1

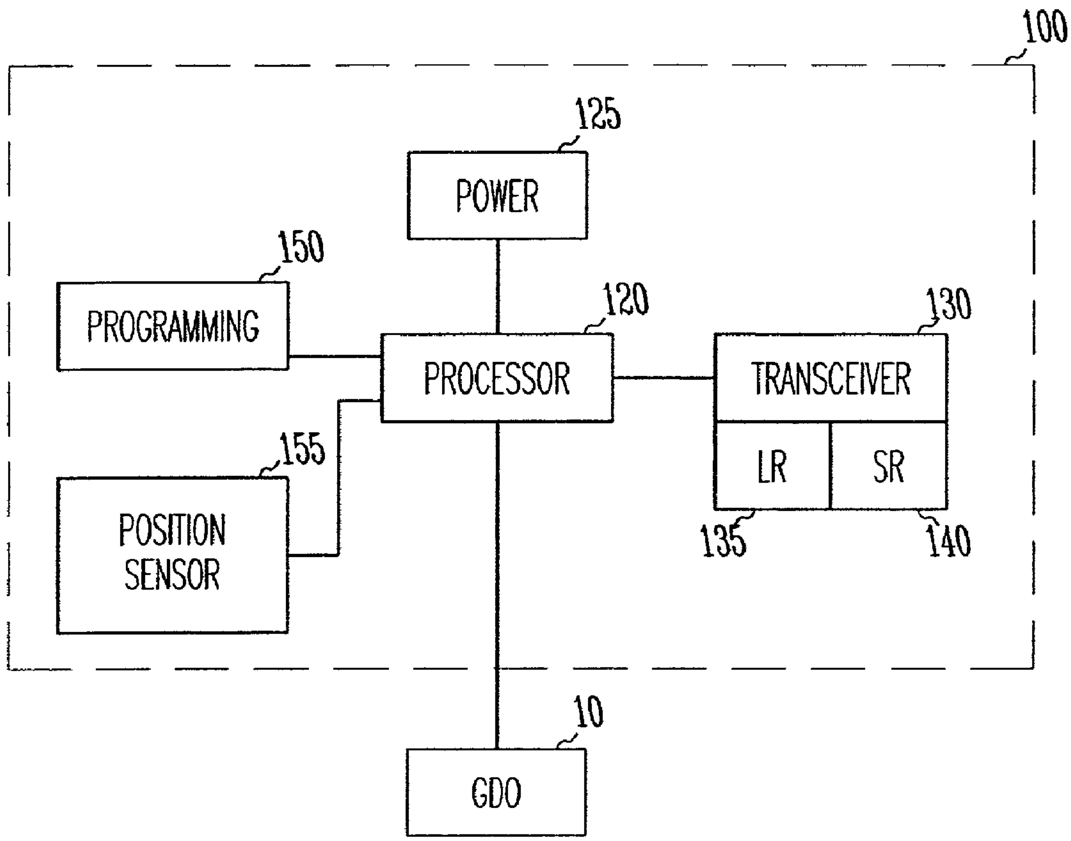

100
125
POWER
150
PROGRAMMING
120
PROCESSOR
130
TRANSCEIVER
155
LR
SR
POSITION SENSOR
135
140
10
GDO

Fig.2

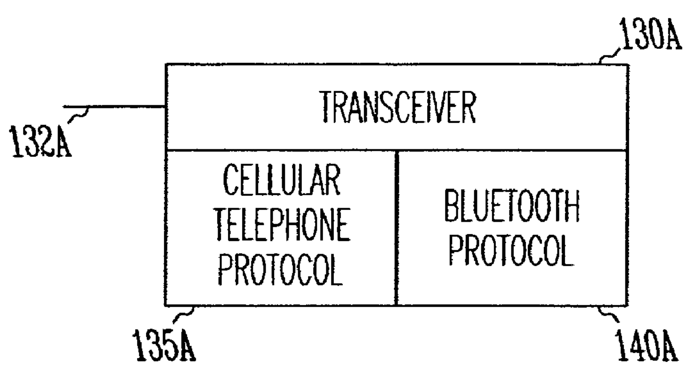

130A
TRANSCEIVER
132A
CELLULAR TELEPHONE PROTOCOL
BLUETOOTH PROTOCOL
135A
140A

Fig.3

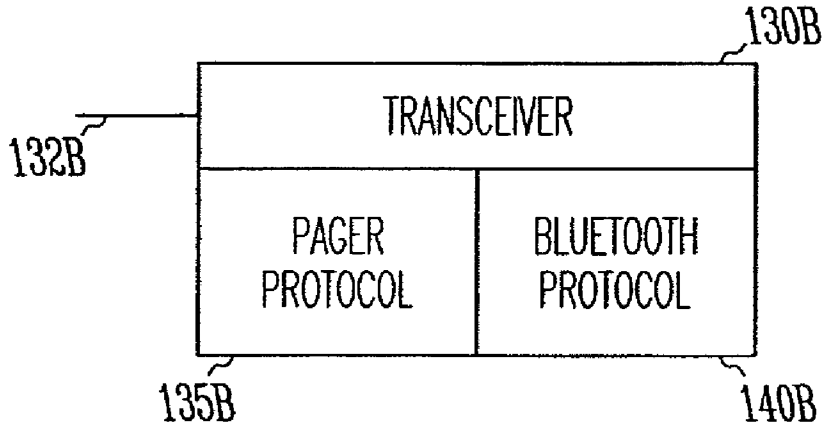

130B
TRANSCEIVER
132B
PAGER PROTOCOL
BLUETOOTH PROTOCOL
135B
140B

Fig. 4

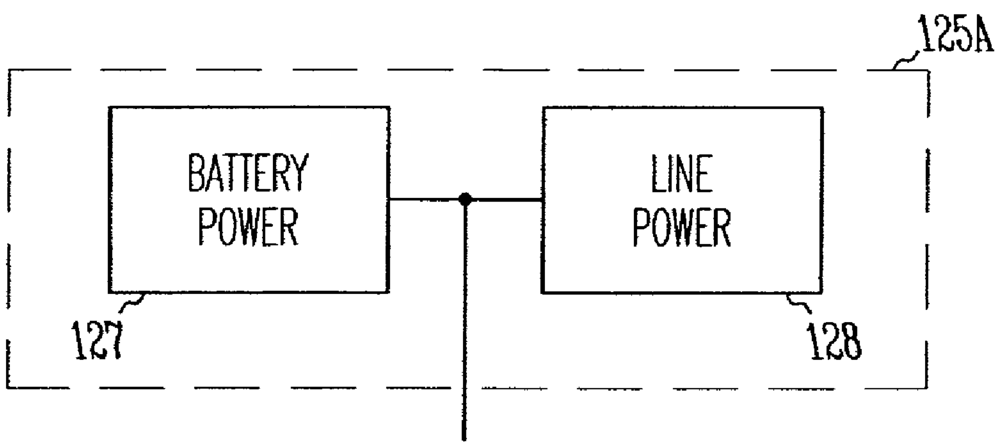

125A
BATTERY POWER
LINE POWER
127
128

Fig. 5

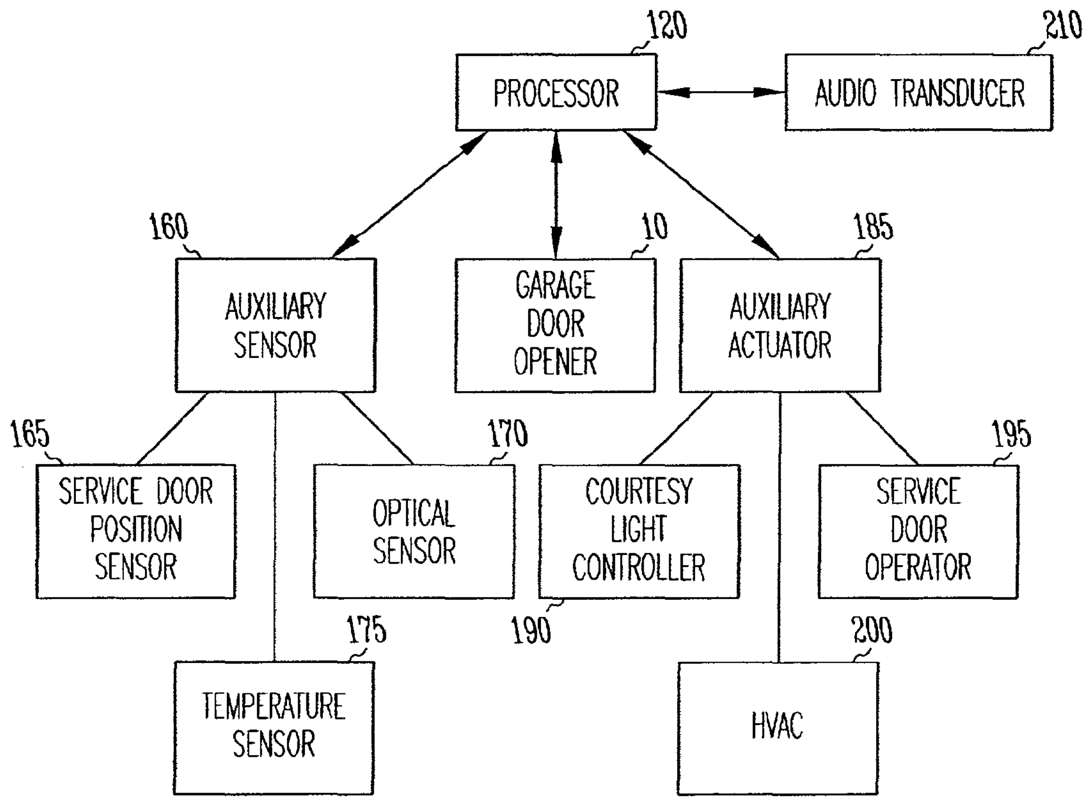

120
PROCESSOR
210
AUDIO TRANSDUCER
160
AUXILIARY SENSOR
10
GARAGE DOOR OPENER
185
AUXILIARY ACTUATOR
165
SERVICE DOOR POSITION SENSOR
170
OPTICAL SENSOR
COURTESY LIGHT CONTROLLER
190
195
SERVICE DOOR OPERATOR
175
TEMPERATURE SENSOR
200
HVAC

Fig. 6

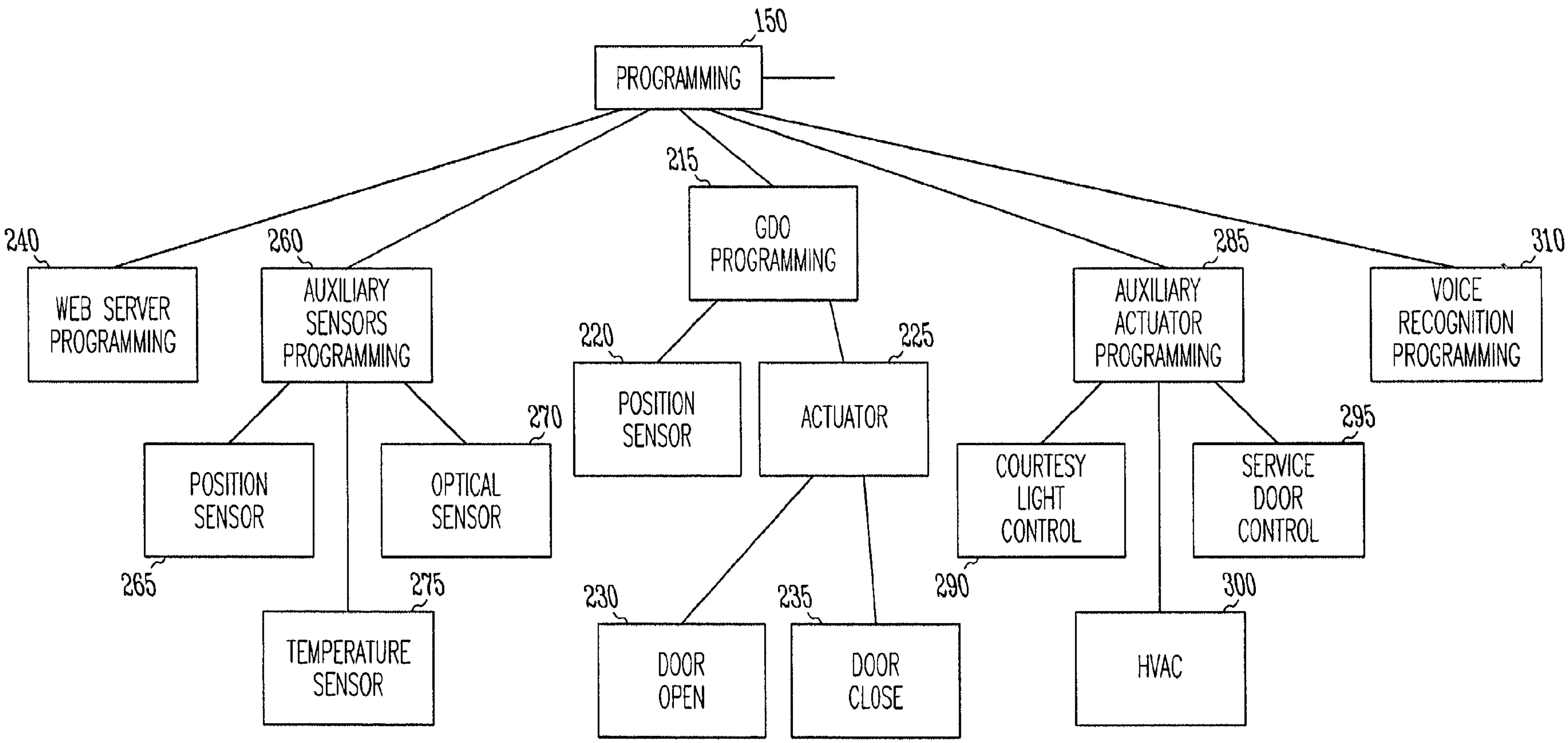

150
PROGRAMMING
215
GDO PROGRAMMING
240
WEB SERVER PROGRAMMING
260
AUXILIARY SENSORS PROGRAMMING
285
AUXILIARY ACTUATOR PROGRAMMING
310
VOICE RECOGNITION PROGRAMMING
220
POSITION SENSOR
225
ACTUATOR
265
POSITION SENSOR
270
OPTICAL SENSOR
275
TEMPERATURE SENSOR
230
DOOR OPEN
235
DOOR CLOSE
290
COURTESY LIGHT CONTROL
295
SERVICE DOOR CONTROL
300
HVAC

Fig. 7

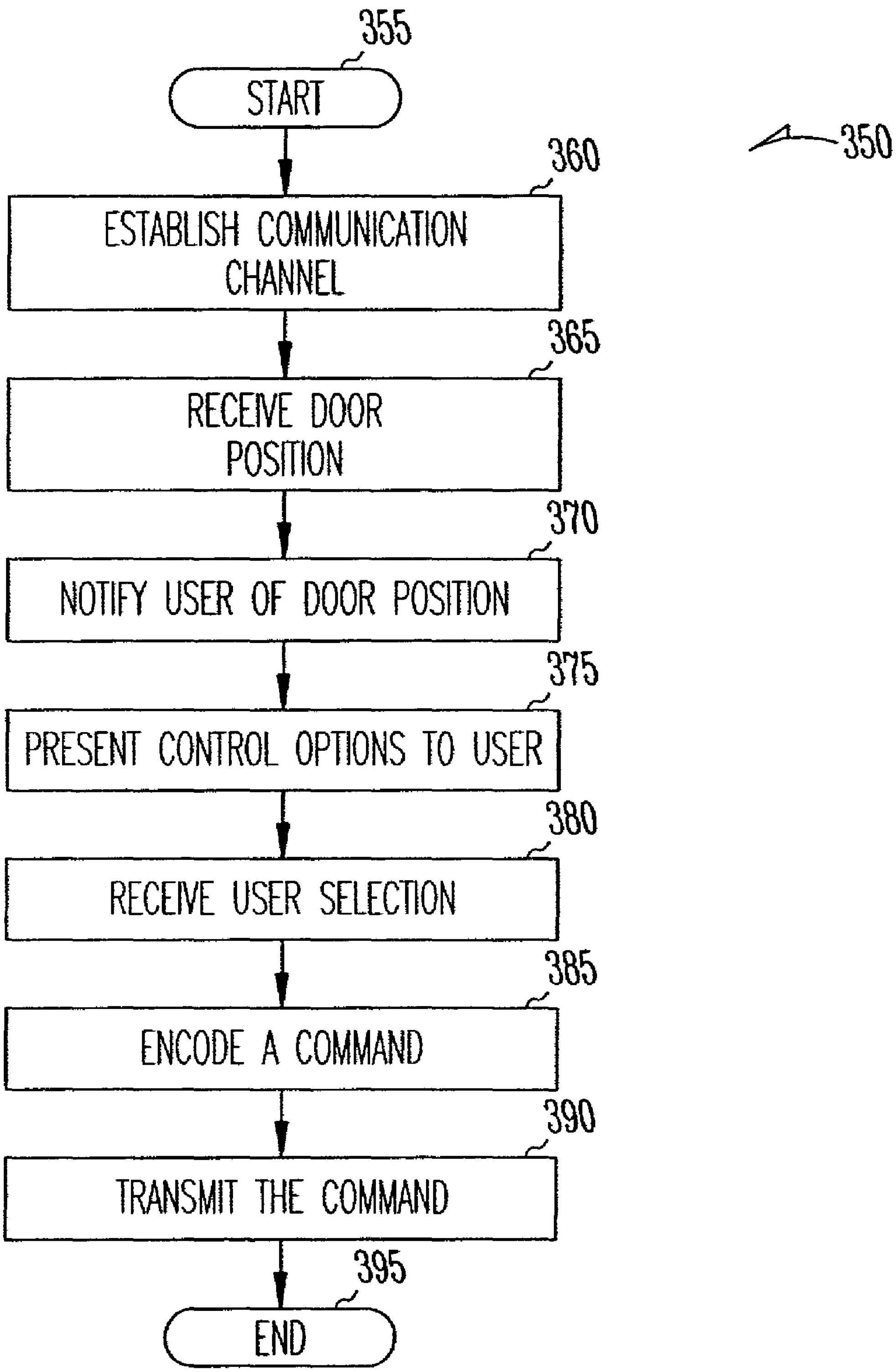

355
START
350
360
ESTABLISH COMMUNICATION CHANNEL
365
RECEIVE DOOR POSITION
370
NOTIFY USER OF DOOR POSITION
375
PRESENT CONTROL OPTIONS TO USER
380
RECEIVE USER SELECTION
385
ENCODE A COMMAND
390
TRANSMIT THE COMMAND
395
END

Fig. 8

POWER DOOR CONTROL AND SENSOR MODULE FOR A WIRELESS SYSTEM

TECHNICAL FIELD OF THE INVENTION

[**0001**] The present invention relates generally to the field of wireless control and monitoring and, in particular, to a wireless system for controlling and monitoring a power door.

BACKGROUND OF THE INVENTION

[**0002**] For reasons of convenience and safety, many overhead garage doors are equipped with an electric door opener. Automobile drivers find it convenient to remotely open and close the overhead door without exiting their car. Homeowners also enjoy the convenience of opening the garage door with a push of a button. Often, a control button is wired directly to the opener and located on an interior surface of a garage wall. Homeowners also find that a properly installed electric garage door opener improves personal safety. Most doors are heavy and, unless operated with appropriate care, can be lethal if dropped on a child. Safety features of modem garage doors, including automatic reverse on obstruction and floor level optical sensors, provide some measure of protection against crushing a person.

[**0003**] However the typical garage door opener suffers from a number of problems. First, garage door openers lack any feedback to indicate the position of the door to the user. Unless the user observes complete closure of the door, there remains the possibility that the door will return to an open position after the user has driven out of view. For example, if a cat runs out of the garage moments before complete closure or if a broom handle falls in the path of the door, the opener will return the door to an open position. An unattended home with an open garage door is an easy target for a burglar. Second, in most cases, the user must use either the proprietary remote control encoded for use with the particular opener or the wired button usually affixed to a wall surface. If the remote control is unavailable, then the user is inconvenienced and forced to use other means to open the door. For example, without a remote control, the user may have to enter the garage using an alternate door or use an external switch. Third, typical garage door openers lack adequate security protection to prevent operation of the door by an unauthorized person. For example, in some cases, the wireless garage door opener access code can be stolen by a third party using code grabbing devices. Using such a device, a thief waiting near the home can copy the wireless access code and later return to burglarize the garage, and in some cases, the home.

[**0004**] A profile schematic of a residential garage door opener system **10** is illustrated in **FIG. 1**. In the figure, power unit **15** may include an electric motor that provides the force to open and close the garage door. Power unit **15** may include a belt drive, a chain drive, gear train or other power transmission means to convert rotational forces to linear motion. In the typical installation, power unit **15** is anchored securely to rafters or other ceiling structure in the garage by supporting structure **55**, which may include angle iron or other stock.

[**0005**] Trolley mechanism **25** travels along track **20** in the directions shown generally by arrow **50**. Track **20** is attached at one end to power unit **15** and attached at the other end to the garage structure at bracket **45**. Actuator arm **30** is flexibly coupled to trolley **25** on one end and flexibly coupled to garage door **40** by bracket **35**. Door **40** may be fabricated of wood, aluminum, steel, fiberglass or any other material and often includes multiple door panels, each of which is commonly referred to as a section, arranged in a hinged assembly. A section of door is illustrated in **FIG. 1**. The edge of each section of garage door **40** includes rollers. The rollers engage door tracks mounted along the sides of the door opening.

[**0006**] Switch **65** is wired directly to power unit **15** by line **70**. Switch **65** is often mounted on a wall adjacent to a service door to the garage. Normally, when the button on switch **65** is pressed, power unit **15** drives door **40** to an open position if door **40** closed, and to a closed position if open. Electrical power to operate in this manner is drawn from line cord **60** which is typically plugged into a nearby outlet mounted in the ceiling of the garage.

[**0007**] In addition to switch **65**, power unit **15** can be operated by using remote control **85**. Control **85** includes a wireless transmitter that broadcasts a signal to power unit **15** by radio link **80**. In the figure, antenna **75** is mounted on power unit **15**, however, an antenna may, instead, be located on switch **65**. Control **85** is most often used by a driver from within an automobile. Control **85**, like switch **65**, causes power unit **15** to drive door **40** to an open position if closed, and to a closed position if door **40** is open.

[**0008**] For the reasons stated above, and for other reasons stated below which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for systems and methods to control and manage a door opener system or other device using a controller having an unlimited geographical range, interoperability with other systems, simple programming to enable easy set-up and configuration of the remote control system, and feedback indicating status or mode of operation of the opener or other device.

SUMMARY OF THE INVENTION

[**0009**] The above mentioned problems with door openers and other problems are addressed by the present invention and which will be understood by reading and studying the following specification. A system and method is described which allows remote control and management of single or multiple door openers using a wired or wireless communication device. The device may be a cellular telephone, a pager, a personal digital assistant, a computer or other device that communicates using a network.

[**0010**] In particular, an illustrative embodiment of the present invention includes a processor executing programming and coupled to a door opener, a position sensor, and a wireless transceiver that communicates using both a long range communication protocol and a short range communication protocol. A user need not specify the communication protocol to be used in controlling or managing the opener. The opener receives commands and transmits status information using either or both of the long range and short range protocols. In one embodiment, the system detects the presence of a short range protocol device, disables long range communications, and engages in short range communications with the detected device. When the distance between the device and the door opener exceeds the effective range of the short range device, the system terminates short range communications and establishes a communication link using a long range communication protocol. The communication link, whether long range or short range, provides a channel for communicating information from the door opener to the device and for communicating instructions from the device to the door opener.

[0011] Position information is transmitted to the device by a transceiver coupled to the processor. Other information, such as temperature or light levels, may also be transmitted to the device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 schematically illustrates a residential garage door opener.

[0013] FIG. 2 illustrates a block diagram of one embodiment of the present system.

[0014] FIG. 3 illustrates one embodiment of a transceiver in accordance with one embodiment of the present system.

[0015] FIG. 4 illustrates one embodiment of a transceiver in accordance with one embodiment of the present system.

[0016] FIG. 5 illustrates one embodiment of a power supply in accordance with one embodiment of the present system.

[0017] FIG. 6 illustrates one embodiment of a processor in accordance with one embodiment of the present system.

[0018] FIG. 7 illustrates one embodiment of programming in accordance with one embodiment of the present system.

[0019] FIG. 8 illustrates one embodiment of a method in accordance with one embodiment of the present system.

DETAILED DESCRIPTION OF THE INVENTION

[0020] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific illustrative embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical and electrical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense.

[0021] FIG. 2 illustrates a block diagram of one embodiment of present system **100**. System **100**, illustrated by the dashed box, includes processor **120**, power supply **125**, transceiver **130**, programming **150** and position sensor **155**. Processor **120** is coupled to, and executes, programming **150**. Processor **120** is also coupled to elements labeled power **125** and transceiver **130**.

[0022] In the figure, GDO **10** represents a garage door opener which may include system **10** as previously described relative to FIG. 1. It will be appreciated that, for purposes of this description, the garage door opener **10** is not included in the system. However, other embodiments of the system are also contemplated, one of which includes the garage door opener as part of the system.

[0023] Processor **120** may include a microprocessor as well as memory to perform the programmed functions and to retain settings and configuration information. Processor **120** may also include a driver circuit to provide an electrical signal at a level sufficient to operate the garage door opener. Processor **120** may also include a circuit to receive electrical signals from electrical, or electromechanical sensors and monitors and to provide an electrical signal to drive an actuator.

[0024] Power supply **125** represents a power supply system that provides electrical energy for system **100**. As described in a subsequent section, power supply **125** may include a battery power supply and a line powered supply.

[0025] Programming **150** may include the instructions and data to enable the processor to perform the functions of the present system. Among the programming functions in one embodiment are instructions for causing processor **120** to actuate a particular control upon receiving a predetermined signal. For example, if a garage door position sensor indicates that the door is in a raised position and an obstruction in the path of the garage door travel is detected by an optical sensor, then a signal received by the processor requesting the door to be closed is met with programming requesting that the obstruction be cleared before the door will travel. Processor **120** and programming **150** may include logic gates, circuitry or software to accomplish the selected functions.

[0026] Transceiver **130** represents a wireless receiver and transmitter able to communicate using both a long range communication protocol and a short range communication protocol. For example, in one embodiment, the transceiver module includes two separate transceivers, namely, a long range transceiver **135** for long range communications, such as that used with cellular telephone communications and second transceiver for communicating over a short range. A short range communication protocol, such as BLUETOOTH®, allows wireless communications over distances commonly thought of as premises-based. It will be further appreciated that with suitable repeaters, gateways, switches or networks, the effective range of communication of transceiver **130** may be extended to any distance.

[0027] In one embodiment, transceiver **130** communicates, using a short range protocol, with a second transceiver that communicates using a long range protocol. For example, transceiver **130** may include a BLUETOOTH® transceiver and may communicate with a second transceiver. The second transceiver, in addition to having a BLUETOOTH® section, also interfaces with a long range communication network. For example, the second transceiver may include a BLUETOOTH® transceiver and a connector that interfaces with a public switched telephone network (PSTN), a cellular telephone network, a pager network or other network having a long range communication protocol.

[0028] According to one definition, and subject to the vagaries of radio design and environmental factors, short range may refer to systems designed primarily for use in and around a premises and thus, the range generally is below a mile. Short range communications may also be construed as point-to-point communications, examples of which include those compatible with protocols such as BLUETOOTH®, HomeRF™, and the IEEE 802.11 WAN standard (described subsequently). Long range, thus, may be construed as networked communications with a range in excess of short range communications. Examples of long range communication may include, Aeris MicroBurst cellular communication system, and various networked pager, cellular telephone or, in some cases, radio frequency communication systems.

[**0029**] In various embodiments, a user may communicate with system **100** using a telephone coupled to the public switched telephone network (PSTN), a cellular telephone, a pager (either one way or two way), a personal communication device (such as a personal digital assistant, PDA), a computer, or other wired or wireless communication device.

[**0030**] Position sensor **155** is coupled to processor **120**. In various embodiments, sensor **155** may include one or more magnetic switches, contact switches, optical devices or cameras. For example, in one embodiment, sensor **155** includes a first magnetic switch to detect door **40** in an open position and second magnetic switch to detect door **40** in a closed position. Sensor **155** may be connected to processor **120** by a wired connector or by a wireless link. Sensor **155** provides an electrical signal corresponding to the position of door **40**. The input to sensor **155** may be derived from door **40**, trolley **25**, or other member that provides reliable information relative to the position of door **40**.

[**0031**] An embodiment of transceiver **130** is illustrated in **FIG. 3**. Transceiver **130**A is coupled to processor **130** by link **132**A. In the figure, transceiver **130**A is shown having compatibility with both a cellular telephone protocol **135**A and a BLUETOOTH® protocol **140**A. Other long range communication protocols may include, but are not limited to, cellular telephone protocols, one way or two-way pager protocols, and personal communication service (PCS) protocols. Examples include Time Division Multiple Access (TDMA), 3G, Aloha, Global System for Mobile Communications (GSM), Code-Division Multiple Access (CDMA), Short Message Service (SMS) and General Packet Radio Service (GPRS).

[**0032**] Personal Communications Service (PCS) describes a set of cellular technologies employing CDMA (also known as IS-95), GSM, or North American TDMA (also known as IS-136) air interfaces. PCS systems typically operate in the 1900 MHZ frequency range.

[**0033**] Time Division Multiple Access (TDMA) describes a digital wireless technology using time-division multiplexing (TDM) in which a radio frequency is time divided and slots are allocated to multiple calls. TDMA is used by the GSM digital cellular system.

[**0034**] A third specification, known as 3G, promulgated by the ITU (International Telecommunication Union, headquarters in Geneva, Switzerland) represents a third generation of mobile communications technology with analog and digital PCS representing first and second generations. 3G is operative over wireless air interfaces such as GSM, TDMA, and CDMA. The new EDGE (Enhanced Data rates for Global Evolution) air interface has been developed specifically to meet the bandwidth needs of 3G.

[**0035**] Another protocol, known as Aloha, enables satellite and terrestrial radio transmissions.

[**0036**] Global System for Mobile Communications, GSM, is another digital cellular system and uses TDMA, thus allowing eight simultaneous calls on the same radio frequency.

[**0037**] Code-Division Multiple Access (CDMA) is a digital cellular technology that uses spread-spectrum techniques. CDMA does not assign a specific frequency to each user but rather every channel uses the full available spectrum and individual conversations are encoded with a pseudo-random digital sequence.

[**0038**] Another transmission protocol, Short Message Service (SMS) allows Ace communications of short messages with a cellular telephone, fax machine and an IP address. Messages are generally limited to a length of 160 alphanumeric characters.

[**0039**] General Packet Radio Service (GPRS) is another standard used for wireless communications and operates at transmission speeds far greater than GSM. GPRS can be used for communicating either small bursts of data, such as e-mail and Web browsing, or large volumes of data.

[**0040**] The short range communication protocol may include, but is not limited to, wireless protocols such as BLUETOOTH®, HomeRF™, wireless LAN (WLAN) or other personal wireless networking technology.

[**0041**] BLUETOOTH® is a trademark registered by Telefonaktiebolaget LM Ericsson of Stockholm, Sweden and refers to short range communication technology developed by an industry consortium known as the BLUETOOTH® Special Interest Group. BLUETOOTH® operates at a frequency of approximately 2.45 GHZ, utilizes a frequency hopping (on a plurality of frequencies) spread spectrum scheme, and provides a digital data transfer rate of approximately 1 Mb/second. In one embodiment, the present system includes a transceiver in compliance with BLUETOOTH® technical specification version 1.0, herein incorporated by reference. In one embodiment, the present system includes a transceiver in compliance with standards established, or anticipated to be established, by the Institute of Electrical and Electronics Engineers, Inc., (IEEE). The IEEE 802.15 WPAN standard is anticipated to include the technology developed by the BLUETOOTH® Special Interest Group. WPAN refers to Wireless Personal Area Networks. The IEEE 802.15 WPAN standard is expected to define a standard for wireless communications within a personal operating space (POS) which encircles a person. In one embodiment, the transceiver is a wireless, bidirectional, transceiver suitable for short range, omnidirectional communication that allows ad hoc networking of multiple transceivers for purposes of extending the effective range of communication. Ad hoc networking refers to the ability of one transceiver to automatically detect and establish a digital communication link with another transceiver. The resulting network, known as a piconet, enables each transceiver to exchange digital data with the other transceiver. According to one embodiment, BLUETOOTH® involves a wireless transceiver transmitting a digital signal and periodically monitoring a radio frequency for an incoming digital message encoded in a network protocol. The transceiver communicates digital data in the network protocol upon receiving an incoming digital message.

[**0042**] In general, the effective communication range of BLUETOOTH® is relatively short, sometimes characterized with a maximum range of approximately 10 to 100 meters. The short range capabilities of BLUETOOTH® are suitable for premises-based applications, such as data exchange within a range roughly equal to the lineal boundaries of a typical property, or premises.

[**0043**] Communication range can be extended beyond this range by a number of different methods. For example, the range may be extended by coupling a BLUETOOTH® connection with a cellular telephone network, a narrow band personal communication systems ("PCS") network, a CELLEMETRY network, a narrow band trunk radio network or other type of wireless communication link. Examples of PCS technology includes Code-Division Multiple Access (CDMA by Qualcomm Inc.), ReFLEX (by Motorola), Time Division Multiple Access (TDMA), Global Systems for Mobile communications (GSM) or others.

[**0044**] A user with a cellular telephone, or other cellular device, is then able to communicate with the BLUETOOTH® device as though the user was local. The long distance network may include communications using a control channel. One such example is CELLEMETRY®. CELLEMETRY® is a registered trademark of Cellemetry LLC of Atlanta, Ga., USA, and enables digital communications over a cellular telephone control channel. Other examples of communication technology are also contemplated, including MicroBurst™ technology (MicroBurst™ is a trademark of Aeris.net, Inc.) or short message service (SMS). In one embodiment, the long distance network may include a pager network. In one embodiment, the pager network is a two-way pager network enabling bidirectional communication between a BLUETOOTH®-enabled sensor, or device, and a user controlled pager. In one embodiment, the long distance network includes a narrow band Personal Communication System network. In one embodiment, the long distance network may include a telephone network. The telephone network may include communicating using an intranet or the Internet. Coupling to such a network may be accomplished, for example, using a variety of connections, including a leased line connection, such as a T-1, an ISDN, a DSL line, or other high speed broadband connection, or it may entail a dial-up connection using a modem. In one embodiment, the long distance network may include a radio frequency or satellite communication network. In addition, one or more of the aforementioned networks may be combined to achieve desired results.

[**0045**] Another short range communication protocol, known as HomeRF™, currently defined by specification 2.1, provides support for broadband wireless digital communications at a frequency of approximately 2.45 GHZ. HomeRF™ specification 2.1 is herein incorporated by reference.

[**0046**] Other long range and short range communication protocols are also contemplated and the foregoing examples are not to be construed as limitations but merely as examples.

[**0047**] Transceiver **130** may be compatible with more than two communication protocols. For example, transceiver **130** may be compatible with three protocols, such as a cellular telephone communication protocol, a two-way pager communication protocol, and BLUETOOTH® protocol. In such a case, a particular garage door opener may be operable using a cellular telephone, a two-way pager, or a device compatible with BLUETOOTH®. Furthermore, it will be appreciated that each of the aforementioned devices, namely a cellular telephone, a two-way pager, and a device compatible with BLUETOOTH®, may be combined in a single portable housing.

[**0048**] Transceiver **130** may include circuitry to allow communications on more than one protocol. For example, position information may be received on a pager protocol and a user may transmit a command to operate the door opener using a cellular telephone protocol.

[**0049**] **FIG. 4** illustrates an embodiment of transceiver **130**B that is compatible with a pager protocol **135**B and a BLUETOOTH® protocol **140**B. Transceiver **130**B is coupled to processor **130** by link **132**B. Pager protocol **135**B may include one way or two way pager protocols. Examples of one way pager protocols include Post Office Code Standardisation Advisory Group (POCSAG), Swedish Format (MBS), the Radio Data System (RDS, by Swedish Telecommunications Administration) format and the European Radio Message System (ERMES, by European Telecommunications Standards Institute) format, Golay Format (by Motorola), NEC-D3 Format (by NEC America), Mark IV/V/VI Formats (Multitone Electronics), Hexadecimal Sequential Code (HSC), FLEX™ (Motorola) format, Advanced Paging Operations Code (APOC, by Philips Paging) and others. Examples of two way pager protocols include ReFLEX™ (Motorola) format, InFLEXion™ (Motorola) format, NexNet™ (Nexus Telecommunications Ltd. of Israel) format and others.

[**0050**] In one embodiment using a pager system, system **100** provides a pager signal to indicate the position of the door or any other information relative to the garage or the door opener. Using a one way pager, the user may operate the door opener, or operate an actuator, using another communication channel, including for example, a cellular telephone or a personal communication device. Using a two way pager, the user may operate the door opener, or operate an actuator, using the reply communication channel of the pager. The outbound signal (e.g., indicating the door position) may be transmitted to the pager on a predetermined schedule, or upon inquiry, or upon a change of position of the door (or actuator) at any time.

[**0051**] **FIG. 5** illustrates one embodiment of power supply **125**A. Battery power **127** may include a dry cell, a gel cell, or other power supply. In addition, battery power **127** may include rechargeable batteries. The recharging power may be supplied by line power **128**, solar power derived from sunlight, or other available means. Line power **128** may include 110 volt metered electric service, 220 volt metered electric service, or other convenient electrical service. In one embodiment, door opener **10** includes a plug-in power cord which couples to a nearby electrical outlet. In such a case, the battery power **127** is received from line power **128**.

[**0052**] In the event of a power outage, or other interruption of the metered electric service, door opener **10** may not be operable. However, battery power **127** has sufficient capacity to continue powering processor **120**, transceiver **130**, and position sensor **155**. Battery power **127** allows the user to continue to wirelessly receive information regarding the position of the door regardless of the status of line power **128**. In one embodiment, transceiver **130** provides a wireless signal to the user to indicate that line power **128** has been restored.

[0053] **FIG. 6** illustrates a variety of sensors, actuators, and transducers coupled to processor **120**. Driver circuits and receiver circuits may be employed between the sensors, actuators, and transducers to provide a signal level compatible with that of the processor. In various embodiments, one or more of the following sensors, actuators, and transducers may be included in system **10**. In one embodiment, system **100** includes apparatus to provide a camera view of the door. The camera view may be derived from a video camera or still camera as part of system **100** and the view may represent fall motion video or still photos of the door or other operated equipment.

[0054] Auxiliary sensor **160** may be coupled to processor **120**. Sensor **165** represents an example of an auxiliary sensor coupled to a service door or other entry. The service door may provide access to the interior of the garage or it may provide access to other areas associated with the garage. For example, sensor **165** may monitor the position of a gate at the driveway to the garage. Optical sensor **170** may include any sensor relying on optical information to generate an electrical signal. For example, sensor **170** may include a light source and photocell to detect hazards associated with operation of door **40** or sensor **170** may provide a signal to indicate if an interior or exterior garage light is illuminated. Sensor **170** may also provide a signal to indicate if it is daytime or nighttime. Temperature sensor **175** may include a thermal element to indicate a temperature present inside the garage or external to the garage. For example, sensor **175** may indicate a freezing hazard or an overheating condition within the garage. Temperature sensor **175** may also be coupled to door opener **10** to indicate a dangerous overheating condition of opener **10**.

[0055] Door opener **10** may be coupled to processor **120**. Door opener **10** may include a system as described above relative to **FIG. 1**.

[0056] Auxiliary sensor **185** may be coupled to processor **120** and may include electrical or mechanical actuators or controls other than opener **10**. For example, sensor **190** indicates a courtesy light controller. Using the remote control of the present system, a user can control an interior or exterior courtesy light. Controlling the light may include adjusting the brightness or turning it on, off or flashing the light. As another example, HVAC actuator **200** represents any or all elements of a heating, ventilation and air conditioning system. In particular, HVAC actuator **200** may include a coupling to a mechanical actuator, thermostat, ventilation system or other control. Using the remote control of the present system, a user can control heating, ventilation, or air conditioning system. Sensor **175** may operate in conjunction with HVAC actuator **200**. Service door operator **195** indicates a power door actuator coupled to a service door, or other entry, providing access to the interior of the garage or other space.

[0057] Audio transducer **210** may be coupled to processor **120** and may include a microphone, speaker, or other audio transducer. The microphone is mounted in a position to receive local audio from a caller located outside of the garage. In one embodiment, audio transducer **210** includes a microphone mounted on the external surface of the structure (or garage) having door opener **10**. Alternatively, the transducer is mounted in the interior of the garage and an orifice is provided in the garage wall to pick up sounds external to the garage. Transducer **210**, in conjunction with processor **120**, provides a voice recognition system that enables voice control of operation of door opener **10**, or other actuators.

[0058] **FIG. 7** graphically presents a block diagram of the functions performed by the programming executing on processor **120**. Programming **150** includes, in various embodiments, web server programming **240**, auxiliary sensors programming **260**, door opener programming **215**, auxiliary actuator programming **285** and voice recognition programming **310**. Programming may include circuitry, logical gates, software, or other elements.

[0059] Web server programming **240** provides an interface to allow remote control of system **100**. For example, and not by way of limitation, server programming **240** may include a wireless application protocol (WAP) server that couples to a telephone (or other communication) network to allow a user to operate, program and monitor system **100**. In one embodiment, a WAP server generates data that can be accessed using an Internet browser. In such a case, for example, the user can remotely configure system **100** to turn off heater (part of HVAC system **200**) anytime door **40** is open and the exterior temperature (as determined by temperature sensor **175**) is below 50 degrees Fahrenheit. As another example, the user can remotely configure system **100** to block operation of door opener **10** in response to voice commands (received by audio transducer **210**) from a selected person. Data for the user-selected programming may be stored in memory coupled to processor **120**. These and other programming configurations are contemplated.

[0060] Auxiliary sensors programming **260** may include position sensor programming **265**, temperature sensor programming **275**, and optical sensor programming **270**. Position sensor programming **265** may include software routines and modules that receive and interpret position information derived from door position sensor **165**. Optical sensor programming **270** may include software routines and modules that receive and interpret information from optical sensor **170**. Temperature sensor programming may include software routines and modules that receive and interpret information from temperature sensor **175**. Other sensors, and appropriate programming, are also contemplated.

[0061] Door programming may include position sensor programming **220** and actuator programming **225**. Position sensor programming **220** may include software routines and modules that receive and interpret position information derived from a door position sensor as part of door opener **10**. Actuator programming may include door open programming **230** and door close programming **235**. Door open programming **230** may include software routines and modules that raise door **40** in response to commands received by processor **120**. Door close programming **235** may include software routines and modules that lowers door **40** in response to commands received by processor **120**. Both door open programming **230** and door close programming **235** may also include programming that executes instructions in accordance with user specified, or predetermined, configurations. Door close programming **235** may also check for obstructions in operating the door before instructing door opener **10** to move to a closed position.

[0062] Auxiliary actuator programming may include, for example, courtesy light control programming **290**, HVAC programming **300** and service door control programming

295. Courtesy light control programming **290** may include software routines and modules that control the operation of an interior, or exterior, courtesy light associated with the garage and coupled to processor **120** by courtesy light controller **190**. HVAC programming **300** may include software routines and modules that control the operation of HVAC system **200** coupled to processor **120**. Service door control programming **295** may include software routines and modules that control the operation of service door operator **195** coupled to processor **120**.

[**0063**] Programming also may include voice recognition programming **310**. Voice recognition programming **310** may include software programming for recognizing and executing instructions commensurate with a voice recognition system. The voice recognition system allows a user to speak into audio transducer **210** and gain control over the operation of system **100**. Programming **310** may include a security function to authenticate a voice command received by audio transducer **210** before executing any instructions to operate door opener **10**.

[**0064**] Other programming functions are also contemplated. For example, a predetermined default setting can be configured to control the operation of system **100** in the absence of a user specified configuration. The user may specify a desired configuration by providing instructions through audio transducer **210**, transceiver **130**, or a remote link using web server programming **240**.

[**0065**] Programming **150** may also include software routines or modules to address prioritization matters. With multiple devices configured to independently control the operation of a single door opener, a problem may arise if conflicting commands are simultaneously received by the system. For example, a conflict arises if a first user transmits a long range communication to open the garage door and at the same time (or shortly thereafter) a second user transmits a short range communication to close the same door. A conflict may also arise if a first user attempts to operate a door using a wired button while a second user attempts to operate the same door using a transmitter compatible with a short range protocol of the present system **100**. In such cases, programming **150** executing on processor **120** will execute a routine to determine priority of each received command and suppress lower priority commands. For example, in one embodiment, the long range protocol may be configured to be inferior to that of short range protocol and, in turn, the short range protocol may be inferior to directly wired switch coupled to opener **10**. Other priority configurations may also be established. For example, prioritization may be determined on the basis of proximity to opener **10**, on the basis of identity of a transmitter, on the basis of signal strength received by transceiver **130**, on the basis of recency of last communication, or on any other basis. In one embodiment, the user is empowered to establish a desired configuration. A default configuration may also be provided which is operable in the event that a user-defined configuration is not operable.

[**0066**] Programming **150** may include instructions to cause processor **120** to transmit position information, or any other information, using all modes of communication. In one embodiment, the user is afforded an opportunity to specify the distribution of position information. For example, the user may specify that position information is to be transmitted using only a long range communication protocol during specified hours and to a particularly specified user or group of users.

[**0067**] Programming **150** may also enable processor **120** to communicate with a building security system or control system. For example, in the event of a particular detected security event, door opener **10** may be instructed to either close or open.

[**0068**] **FIG. 8** includes a flow chart describing method **350** involving one embodiment of the present system. Method **350** describes operation of system **100** for receiving door position information and for controlling the door from a remote location.

[**0069**] The method starts at item **355** and assumes that the user has a wireless device capable of communicating with transceiver **130**. At **360**, the user and system **100** establish a link on a communication channel. At **365**, door position information is received by the user. In one embodiment, sensor **155** provides the position information to processor **120**. At **370**, the user receives notification of the door position information. The door position may be indicated by a pair of lights on a pager (one light labeled "open" and another "close"), by a graphical image on a screen, a recognizable audio tone, a recognizable vibration, or any other means of indicating position to a user. At **375**, the user is presented with one or more options to control system **100**. In the case that door **40** is open, options may include partially, or fully, closing the door. A single option may be presented that allows the user to toggle the position of the door between a closed and an open position. The option may be a button or several buttons. At **380**, the user indicates a selection using the portable wireless device. At **385**, the wireless device encodes a message for transmission to system **100** including instructions to operate the door according to the user selection. At **390**, the message is transmitted to system **100**. The message may be routed to system **100** on wired or wireless communication networks. The method ends at **395**.

[**0070**] Other Embodiments

[**0071**] In one embodiment, system **100** is coupled to multiple door openers **10**. For example, many homes include two or more garages, each having an individual door opener. Also, commercial applications often include multiple overhead doors, each having an individual door opener. In such cases, multiple door openers **10** may be coupled to a single system **100** which controls and reports the operation of each door opener.

[**0072**] In one embodiment, programming **150** allows a user having a cellular telephone in communication with system **100** to control and monitor each of several door openers **10**, or other systems coupled to processor **120**. In one embodiment, programming **150** allows a user to control and monitor a single door opener **10**, or other system coupled to processor **120**. Identification and group membership routines implemented by processor **120** and programming **150** allow for a superior user to configure the authority of multiple inferior users over multiple door openers **10**, each coupled to processor **120**, using system **100**.

[**0073**] The present system has been described, in part, relative to the operation of a garage door opener. However, it will be noted that other doors may be controlled and operated using a suitable power opener. The actuator for many garage door openers is electrically operated, however, it is understood that an actuator operable with the present system may include a pneumatically or hydraulically operated actuator. Furthermore, it will be appreciated that, in addition to operating a door, the present system and method may be adapted for use with other controls, such as a window control, Venetian blind control, skylight control, or other operable device or actuator. By way of example, the present system and method may be adapted to operate with a pet access door, a house entry door, an interior swing door, a patio sliding door, a pocket door, an apartment entry door, a sliding window, or an elevator or lift access door. For instance, the present system may be adapted for use with a handicap access door.

[**0074**] In one embodiment, system **100** includes circuitry and programming to detect proximity of a compatible transceiver. For example, system **100** may include a BLUETOOTH® compatible transceiver which implements a self-aware feature to determine the presence of a compatible device within effective range. Thus, if system **100** detects that a compatible device is within range, then a preprogrammed function is executed. Security systems or authorization systems are included in system **100** to ensure that any detected compatible device is authorized to exercise control over system **100**. For instance, and in one embodiment, if a BLUETOOTH® equipped wireless garage door opener is brought within a predetermined range, then system **100** automatically operates an electric garage door opener. In particular, if the door is closed at a time when the door opener is brought within range, then system **100** operates to open the door and if the door is open at a time when the door opener is brought within range, then system **100** operates to close the door. As another example, one embodiment of the present system **100** includes a BLUETOOTH® equipped wireless pet collar and a BLUETOOTH® equipped pet door opener. The pet door is thus automatically opened when a dog wearing the collar approaches the door. As yet another example, one embodiment of the present system **100** includes a BLUETOOTH® equipped module and a BLUETOOTH® equipped handicapped-person accessible door opener. The handicapped-person accessible door is thus automatically opened when a person carrying the module approaches the door. The module may be affixed to a wheelchair or other device.

Conclusion

[**0075**] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention.

What is claimed is:

1. A device comprising:

a processor adapted for coupling to a door opener and having programming including instructions for generating a command to operate the door opener;

a first position sensor coupled to the processor and adapted for generating a first position signal based on a position of a first door coupled to the door opener;

a radio frequency transceiver coupled to the processor and adapted for transmitting the first position signal using a long range communication protocol and a short range communication protocol, and for receiving a wireless signal using the long range communication protocol and the short range communication protocol, the transceiver including circuitry for spread spectrum frequency hopping and wherein the command is based on the wireless signal.

2. The device of claim 1 wherein the transceiver is adapted for communicating on a protocol compatible with a cellular telephone communication protocol.

3. The device of claim 1 wherein the transceiver is adapted for communicating on a protocol compatible with a pager communication protocol.

4. The device of claim 1 wherein the transceiver operates at a frequency of approximately 2.45 GHZ.

5. The device of claim 1 wherein the transceiver is substantially compatible with standards under IEEE 802.15.

6. The device of claim 1 wherein the transceiver is substantially compatible with BLUETOOTH® technical specification version 1.0.

7. The device of claim 1 wherein the first position sensor includes a magnetic switch.

8. The device of claim 1 wherein the first position sensor includes a contact switch.

9. The device of claim 1 wherein the first position sensor includes a camera.

10. The device of claim 1 further comprising a battery coupled to the processor and coupled to the transceiver.

11. The device of claim 1 further comprising an optical sensor coupled to the processor and adapted for generating a light level signal based on light intensity in a region proximate to the first door, and further wherein the transceiver is adapted for transmitting the light level signal.

12. The device of claim 1 further comprising a second position sensor coupled to the processor and adapted for generating a second position signal based on a position of a second door, and farther wherein the transceiver is adapted for transmitting the second position signal.

13. The device of claim 1 wherein the processor includes programming having instructions for generating a web page accessible from the Internet.

14. The device of claim 1 further comprising an audio transducer coupled to the processor and further wherein the processor includes programming having instructions for operating the door opener in response to a vocal command received by the transducer.

15. A method of manufacturing a module comprising:

adapting a processor to couple with a door opener;

adapting the processor to couple with a first position sensor;

coupling a wireless transceiver adapted for spread spectrum frequency hopping to the processor;

adapting the transceiver to receive a first signal in a protocol compatible with a long range communication protocol and in a protocol compatible with a short range communication protocol;

adapting the transceiver to transmit information received from the first position sensor in a protocol compatible with a long range communication protocol and in a protocol compatible with a short range communication protocol; and

providing a program for executing on the processor, the program having instructions to cause the processor to operate the door opener based on the first signal.

16. The method of claim 15 wherein adapting the transceiver to receive a first signal in a protocol compatible with a long range communication protocol includes adapting the transceiver to receive the first signal in a protocol compatible with a long range cellular telephone communication protocol.

17. The method of claim 15 wherein adapting the transceiver to receive a first signal in a protocol compatible with a long range communication protocol includes adapting the transceiver to receive the first signal in a protocol compatible with a pager communication protocol.

18. The method of claim 15 further comprising providing a battery connector coupled to the processor and to the transceiver.

19. The method of claim 15 further comprising adapting the processor to couple with a second position sensor and wherein the transceiver is adapted for transmitting information received from the second position sensor.

20. The method of claim 15 further comprising adapting the processor to couple with an optical sensor and wherein the transceiver is adapted for transmitting a light level signal based on light intensity in a region proximate to a door coupled to the door opener.

21. The method of claim 15 further comprising adapting the processor to generate a command to open a door coupled to the door opener in response to an open signal received by the transceiver in a protocol compatible with the long range communication protocol.

22. The method of claim 15 further comprising adapting the processor to generate a command to open a door coupled to the door opener in response to an open signal received by the transceiver in a protocol compatible with the short range communication protocol.

23. The method of claim 15 further comprising adapting the processor to generate a command to close a door coupled to the door opener in response to a close signal received by the transceiver in a protocol compatible with the long range communication protocol.

24. The method of claim 15 further comprising adapting the processor to generate a command to close a door coupled to the door opener in response to a close signal received by the transceiver in a protocol compatible with the short range communication protocol.

25. The method of claim 15 further comprising adapting the processor to generate a web page accessible from the Internet.

26. The method of claim 15 further comprising adapting the processor to couple with an audio transducer and to operate the door opener in response to a vocal command received by the transducer.

27. A method of operating a door comprising:

establishing a wireless communication channel with a module coupled to the door;

transmitting a position signal on the channel based on a position of the door;

providing an indication to a user based on the position signal; and

receiving an instruction signal on the channel, the instruction signal based on a user selected option for operating the door.

28. The method of claim 27 wherein establishing a wireless communication channel with a module coupled to the door includes communicating using a protocol compatible with a cellular telephone.

29. The method of claim 27 wherein establishing a wireless communication channel with a module coupled to the door includes communicating using a protocol compatible with a pager.

30. The method of claim 27 wherein establishing a wireless communication channel with a module coupled to the door includes communicating using a protocol compatible with BLUETOOTH® technical specification version 1.0.

31. The method of claim 27 wherein providing an indication to a user based on the position signal includes providing a visual indication.

* * * * *

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Presently amended) A movable barrier operator comprising:

- a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;

- a movable barrier interface that is operably coupled to the controller;

- a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:

corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and comprises an identifier that is at least relatively unique to the movable barrier operator, such that ~~at least one, but not all, of the at least two operating states~~ the status condition signal substantially uniquely identifies the movable barrier operator.

2. (Original) The movable barrier operator of claim 1 and further comprises at least one condition status sensor that is operably coupled to the controller.

3. (Original) The movable barrier operator of claim 2 wherein the wireless status condition data transmitter transmits data that corresponds to the at least one condition status sensor.

4. (Canceled).

Application No. 10/447,663 Attorney Docket No. **73857**
Amendment Dated October 23, 2006
Reply to Office Action of July 10, 2006

REMARKS

Pursuant to the above-noted Office Action, claims 1-3, 5-25, and 27-33 are pending in the present application. Claims 1-3, 6, 9, 10, 12, 15, 17-19, 22, 25, 29, 30, 32, and 33 are rejected under 35 U.S.C. §102(b) on the basis of either Morris (U.S. Patent No. 6,184,787) ("Morris") or Chang (U.S. Patent No. 5,798,681) ("Chang"). Claims 7, 8, 21, 23, and 28 are rejected under 35 U.S.C. §103(a) as being unpatentable over either Morris or Chang. Claims 5, 11, 16, 20, and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Morris or Chang in view of Suman (U.S. Patent No. 5,903,226) ("Suman") and Duhame (U.S. Patent No. 4,464,651) ("Duhame"). Claims 13, 14, and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Morris or Chang in view of Peterson (U.S. Publication No. 2004/0212498) ("Peterson"). Claim 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Morris or Chang. The Applicant respectfully traverses these rejections and requests reconsideration.

Claims 1-3, 6, 9, 10, 12, 15, 17-19, 22, 25, 29, 30, 32 and 33 are rejected under 35 U.S.C. §102(b) on the basis of Morris or Chang. With reference to FIG. 1 of Morris (reproduced below), Morris discloses a garage door position monitoring system 10 having a controller 18 that receives a signal from various sensors (12, 14, 16, 48) (which monitor such things a carbon monoxide, temperature, and a position of the garage door) and that sends that signal to a voice synthesizer 20 which in turn sends the signal to a speaker 22 that announces an audible warning.

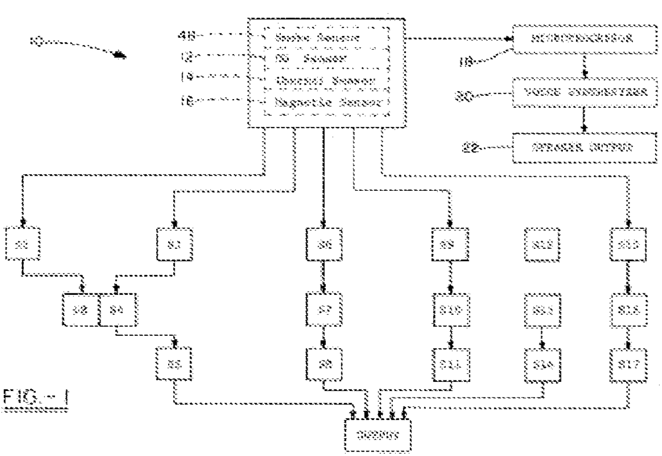


FIG. - 1

a receiver to differentiate this information for other similar information as might be received by another such movable barrier operator (as when, for example, a given garage has two garage doors controlled by separate movable barrier operators).

These differences are well set forth in the independent claims. Claim 1 literally claims "A movable barrier operator" in a limiting preamble. Claim 15 sets forth a method that is practiced by a "movable barrier operator." And claim 25 sets forth an apparatus that comprises a "movable barrier operator." As neither Morris nor Chang make any teaching or suggestion in this regard, neither reference can be said to anticipate the recitations of these claims.

Similarly, all three of these independent claims specifically provide for the transmission of a "status condition signal that:

> corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and *comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator*."[1]

Again, neither Morris nor Chang make any such teaching or suggestion and hence again fail to anticipate this element of these claims.

The remaining claims are dependent claims that ultimately depend upon one of the above-discussed independent claims, which claims have been shown to be allowable. In addition, these claims introduce additional subject matter that, particularly when considered in context with the claims from which they depend, constitutes incremental patentable content. Applicant reserves the right to present further arguments in the future with regard to these dependent claims in the event that their corresponding independent claims are found to be unpatentable.

[1] Emphasis provided.

intention and expectation that they will be purchased and used by consumers in the Northern District of Illinois. Therefore, the exercise of jurisdiction over Defendants is appropriate under the applicable jurisdictional statutes and would not offend traditional notions of fair play and substantial justice.

24. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b), 1391(c) and/or 1400(b), because, among other reasons, Defendants are subject to personal jurisdiction in this judicial district and have committed acts of infringement in this judicial district.

COUNT I

(Infringement of U.S. Patent No. 7,635,966)

25. Plaintiff incorporates and realleges the allegations in the preceding paragraphs as if fully set forth herein.

26. On December 22, 2009, the USPTO duly and legally issued the ’966 patent, entitled “*Barrier Movement Operator Battery Backup And Power Equipment Battery Charging Center*,” to Brian Butler. A true and correct copy of the ’966 patent is attached as Exhibit A.

27. CGI is the owner, by assignment, of all rights, title and interest in the ’966 patent, including the right to recover damages for past infringement.

28. Defendants have infringed and continue to infringe the ’966 patent in this District and throughout the United States by making, using, importing, offering for sale and/or selling one or more of the Accused Controller Products, in addition to the Ryobi One+ rechargeable battery, which practice one or more of the claims of the ’966 patent. For example, based on CGI’s current investigation, the Accused Controller Products infringe at least claim 9 of the ’966 patent as follows:

Claim 9: A battery charging apparatus, comprising:	Defendants’ advertising and product information show how the Accused Controller Products in addition to the Ryobi One+ rechargeable battery meet this claim element:

COUNT II

(Infringement of U.S. Patent No. 7,224,275)

35. Plaintiff incorporates and realleges the allegations in the preceding paragraphs as if fully set forth herein.

36. On May 29, 2007, the USPTO duly and legally issued the'275 patent, entitled "*Movable Barrier Operators Status Condition Transception Apparatus And Method,*" to James J. Fitzgibbon. A true and correct copy of the '275 patent is attached as Exhibit B.

37. CGI is the owner, by assignment, of all right, title and interest in the '275 patent, including the right to recover damages for past infringement.

38. Defendants have infringed and continue to infringe the '275 patent in this District and throughout the United States by making, using, importing, offering for sale and/or selling one or more of the Accused Controller Products, which practice one or more of the claims of the '275 patent. For example, based on CGI's current investigation, the Accused Controller Products infringe at least claim 1 of the '275 patent as follows:

Claim 1: A movable barrier operator comprising:	Defendants' advertising and product information show how the Accused Controller Products meet this claim element: Introducing the next generation of garage door openers with the Ryobi Ultra-Quiet Garage Door Opener. The ultra-powerful motor will quietly open and close large doors with ease due to the 2HPs for faster openings. *Ultra-Quiet Garage Door Opener*, Ryobi Power Tools, https://www.ryobitools.com/power-tools/products/details/802 (last accessed May 19, 2016).
a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating	Defendants' advertising and product information show how the Accused Controller Products meet this claim element:

HIGHLY CONFIDENTIAL OUTSIDE ATTORNEYS' EYES ONLY MATERIAL
SUBJECT TO PROTECTIVE ORDER

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE CHAMBERLAIN GROUP, INC., Plaintiff, v. TECHTRONIC INDUSTRIES CO. LTD., TECHTRONIC INDUSTRIES NORTH AMERICA, INC., ONE WORLD TECHNOLOGIES INC., OWT INDUSTRIES, INC., ET TECHNOLOGY (WUXI) CO. LTD., AND RYOBI TECHNOLOGIES, INC. Defendants.	))))))))))))	Civil Action No.: 1:16-cv-06097 The Honorable Thomas M. Durkin Magistrate Judge Sidney Schenkier **JURY TRIAL DEMANDED** **FILED UNDER SEAL**

PLAINTIFF'S MEMORANDUM
IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION

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I. INTRODUCTION

Plaintiff The Chamberlain Group, Inc. ("CGI") respectfully moves under Fed. R. Civ. P. 65(a) for a preliminary injunction barring Defendants Techtronic Industries North America, Inc. ("Techtronic NA"); One World Technologies Inc.; OWT Industries, Inc.; and Ryobi Technologies, Inc. ("Ryobi") (collectively, "TTI") from infringing claims 9 and 14 of U.S. Patent No. 7,635,966 ("the '966 patent") and claims 1 and 5 of U.S. Patent No. 7,224,275 ("the '275 patent").[1]

Since the 1950's, Elmhurst-based CGI has invested substantial resources to develop the safest and most innovative residential garage door openers ("GDOs") on the market. CGI has expanded beyond traditional GDOs to become a market leader for GDO-integrated technology, including GDOs with battery back-up power and wireless functionality. CGI has obtained over 350 patents on its innovations, most related to GDOs; has created hundreds of jobs in the United States (most in this District); and has secured the safety of [redacted] of American homes. CGI has a long history of bringing products that practice its patents to market and into the hands of consumers, including CGI's signature do-it-yourself Chamberlain® and professionally installed LiftMaster® products.

Until this year, TTI was not a direct competitor of CGI and had never sold a GDO. Then, in April, TTI suddenly started competing head-to-head with CGI with the Ryobi Ultra-Quiet GD200 garage door opener ("Ryobi GDO"). The only possible way for TTI to enter the market so quickly was to do so on the back of CGI's decades of efforts and investment, including CGI's substantial investment in patent protection. TTI's Ryobi GDO is infringing at least two core CGI

[1] Named defendants Techtronic Industries Co. Ltd. (the parent company of Techtronic NA, One World Technologies Inc., OWT Industries, Inc., and Ryobi) and Et Technology (Wuxi) Co. Ltd. (the relevant manufacturer for at least One World Technologies Inc.) are headquartered in China. CGI is in the process of effecting service.

GDO patents: the ’966 patent covering the battery invention Chamberlain disclosed to TTI in 2009 and the ’275 patent covering wireless monitoring and other inventions related to the internet connected GDO.

It is undisputable that TTI’s infringement will directly impact CGI’s business. In fact, the already established evidence shows that consumers are now forced to choose between two very similar products, albeit both built on the same core patented technology. The irreparable harm caused by such infringement is real and TTI poses an immediate threat to erode CGI’s market share and reputation as well as to jobs and innovation at CGI. The law is clear that CGI should not have to compete with its own technology. CGI respectfully requests that this Court enjoin TTI’s infringing behavior before further irreparable harm is done.

II. FACTUAL BACKGROUND

A. CGI’s History of Innovation in the Garage Door Opener Industry

CGI is based in Elmhurst, Illinois, and has a history of quality and safety stretching back more than one hundred years to the 1906 founding of Waterloo Rope Belt Co. (later renamed Chamberlain Machine Works). Declaration of Colin Willmott submitted herewith (“Willmott Decl.”), ¶ 3. CGI, through a predecessor company Perma Power Corp., which CGI acquired in 1968, formally entered the garage door market with its first garage door opener product in 1958. Id., ¶¶ 4-5. CGI introduced the market-leading GDO, now well-known as the signature LiftMaster® opener, just nine years later in 1967. *Id.*, ¶¶ 5, 7. Through its acquisition of Perma Power and since, CGI has created numerous jobs in the United States, including hundreds in this District. Declaration of John Fitzgerald submitted herewith (“Fitzgerald Decl.”), ¶ 3. CGI has long been a leader in the industry, first establishing itself as a leader in safety issues surrounding garage door openers, such as infrared sensors and other safety measures to protect people from

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inadvertent closures. Willmott Decl., ¶¶ 8-17. These safety measures and other innovative technologies have long defined CGI's commitment to development and public safety. *Id*.

Today, CGI designs, manufactures, and sells innovative access control devices, including residential garage door openers, commercial door operators, perimeter access solutions, home connectivity products, and related accessories. Fitzgerald Decl., ¶ 3. CGI's LiftMaster® products are the number one brand of professionally installed garage door openers in the United States, and CGI's do-it-yourself Chamberlain®, LiftMaster®, and private-labeled CGI manufactured products are present in a majority of garages in America. *Id*., ¶ 7. It is estimated that [redacted] of American homes are currently protected with CGI GDO products. Fitzgerald Decl., ¶ 7. CGI's MyQ® technology allows users to remotely monitor and control garage doors, lights, and gates in their homes and businesses with their smartphones. *Id.* at ¶ 8. MyQ® technology has been widely praised, and products incorporating this technology met with immediate commercial success and industry praise upon release. *Id.* at ¶¶ 8-9. CGI currently has over 50 GDO products on the market including its signature do-it-yourself Chamberlain® and professionally installed LiftMaster® products, and over [redacted] more GDO accessories. Fitzgerald Decl., ¶ 7.

It is CGI's substantial investments in research and product development, manufacturing, marketing, and sales that have made it the undisputed leader in the field of garage door openers nationwide. *See* Fitzgerald Decl., ¶¶ 4-6. Through these investments, CGI is able to continually improve its product offerings for its customers. As a result, CGI's products have a reputation for safety, security, and reliability, and CGI has received accolades as an innovation leader in its field of technology. *Id.*, ¶ 6. CGI's substantial investments in R&D have resulted in the issuance of over 350 U.S. patents, and have encouraged its engineers to continue to innovate.

Willmott Decl., ¶ 17. CGI relies upon these patents to protect its business, recoup its substantial research and product development investment, and protect its reputation from imitation devices that are less safe, less secure, or otherwise inferior. *Id.*

B. CGI's Patented Inventions

The '966 and '275 Patents are just two of the many CGI patents that reflect CGI's substantial investment in GDO innovations.

The '966 patent describes a battery charging station powered by a garage door head unit, where the battery both provides backup power to the garage door motor in case of a power outage and is capable of being used to power tools often stored in a garage like a saw or a drill. This invention allows users to reduce the number of batteries and battery charging stations in their households, thereby providing savings with respect to cost and space. Claim 9 of the '966 patent recites:

> 9. A battery charging apparatus, comprising:
>
> a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery, the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment; and
>
> circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.

Declaration of Dr. V. Thomas Rhyne submitted herewith ("Rhyne Decl."), ¶ 35. Claim 14 is a dependent claim that specifies that the electrically powered equipment "comprises a tool." *Id.*, ¶ 36.

The '275 patent describes wirelessly monitoring the status of features associated with the environment of modern garage door openers, while also providing users the security and

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assurance of knowing that the monitored statuses are unique to their garage door openers, not their neighbors'. Claim 1 of the '275 patent recites:

> 1. A movable barrier operator comprising:
>
> a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;
>
> a movable barrier interface that is operably coupled to the controller;
>
> a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:
>
> corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and
>
> comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

Id., ¶ 54. Claim 5 is a dependent claim that identifies fourteen specific operating states, for example "moving a movable barrier in a first direction" or "a vacation mode status change." *Id.*, ¶ 55. Most of CGI's most popular products practice claims 1 and 5 of the '275 patent, including CGI's MyQ® smartphone-controlled garage door openers such as Model No. HD950WF. Rhyne Decl., ¶¶ 56-71.

C. CGI's Prior Dealings with TTI

Around 2009, CGI sought to expand its garage door opener offerings by designing a GDO with battery system that embodied the '966 patent to be sold within the [redacted] stores.[2] Declaration of Ron Brogle submitted herewith ("Brogle Decl."), ¶¶ 3-5. CGI had already been manufacturing GDOs for [redacted] which were sold under the [redacted] brand name, a practice which has continued to this date. Brogle Decl., ¶ 5. The companies discussed modifying a garage door opener so that a [redacted] a rechargeable battery

[2] *See, e.g.*, Rhyne Decl., ¶¶ 37-48 (explaining how CGI's prototype meets every claim element of the '966 patent's claims 9 and 14).

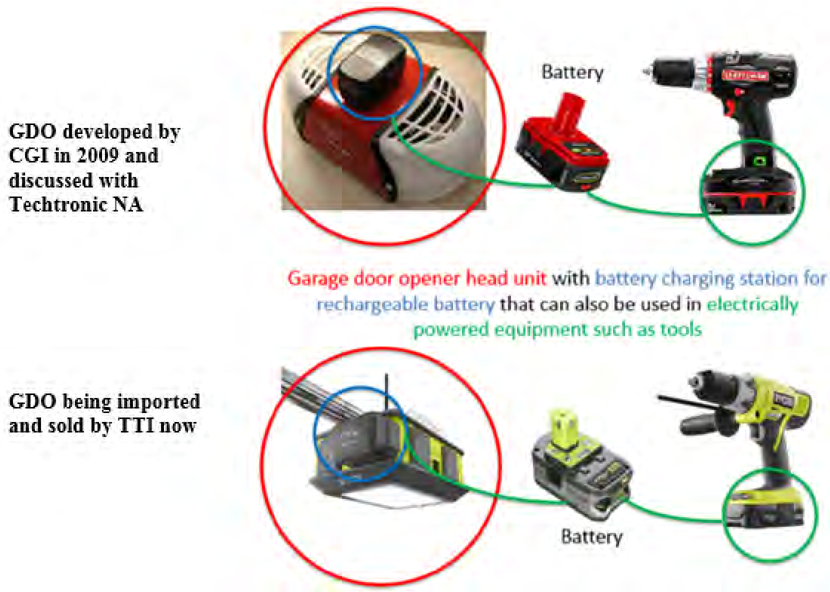
used to power a number of Sears Craftsman® products ranging from cordless drills to circular saws—could be charged by, and used as back-up power for the garage door opener manufactured by CGI. Brogle Decl., ¶ 6. CGI expected that this battery system would be highly desirable to customers, driving sales of CGI's garage door openers and Sears' power tools. Brogle Decl., ¶ 7.

Sears was interested in this idea and directed CGI to Techtronic NA, the supplier of the Sears' batteries for the Craftsman line of tools. Brogle Decl., ¶ 8. Techtronic NA agreed to discuss the project with CGI, on the condition that CGI purchase Techtronic NA's battery charging boards for incorporation into CGI's GDOs. *Id.*, ¶ 9. CGI agreed, disclosed its patented and other ideas with Techtronic NA, and worked through a number of technical, regulatory, and financial hurdles to come up with final design requirements, interface, and operating parameters for the product. *Id.*, ¶ 10. At the conclusion of this work, however, Techtronic NA inexplicably raised the price for its battery charging boards to more than twice CGI's estimated cost, making the product cost-prohibitive to consumers, and effectively terminating the project. *Id.*, ¶¶ 11-13.

On April 20, 2009, shortly after the negotiations between TTI and CGI ended, employees of Techtronic Industries filed a patent application entitled "Garage Door Opener With Secondary Power Source," covering technology similar to that disclosed by CGI during these negotiations. *See* Declaration of Maria Elena Stiteler submitted herewith ("Stiteler Decl."), ¶¶ 3, 7 & Ex. A. This application claimed the benefit of an earlier provisional application filed on Dec. 19, 2008. *Id.* These applications were eventually abandoned. *See* Stiteler Decl., ¶¶ 4-5.

D. The Infringing Ryobi Garage Door Opener

TTI recently started importing into the United States and Canada and selling through Home Depot's physical and online stores the Ryobi GDO—a product that embodies the patented ideas that Techtronic NA learned from the companies' 2009 communications:



See Rhyne Decl. ¶¶ 39-48, 79-99 (discussing features of CGI's design for Sears and the Ryobi GDO with respect to '966 patent claims 9 and 14).

The Ryobi GDO was introduced about two months ago and is now being imported from China into the U.S and sold nationwide, through TTI's exclusive U.S. retailer for Ryobi: The Home Depot. Fitzgerald Decl., ¶ 10. The Ryobi GDO includes a battery back-up feature that infringes CGI's '966 patent. Rhyne Decl. ¶¶ 79-99. This feature allows the Ryobi GDO to be powered by "an electric power source" in normal mode and to switch to the Ryobi battery in emergency power outages. *See* Stiteler Decl., Exhibit N, p. 2. The battery also (as TTI prominently highlights in its advertising) is used to power more than seventy Ryobi-branded tools. *Id.*, Exhibit D, p. 7 & Exhibit H, p. 1. TTI's advertising proclaims: "Rest assured even in power outages, this unit is compatible with

Ryobi GD200 garage door opener, featuring the RYOBI ONE+ battery.

the RYOBI ONE+ system, and is battery backup ready with over 100 openings using a RYOBI ONE+ P108 4Ah Battery." Stiteler Decl., Exhibit D, p. 8.

The Ryobi GDO also includes a system for sending status updates wirelessly in a manner that infringes CGI's '275 patent. Rhyne Decl., ¶¶ 100-136. The system is used in connection with a Ryobi Smartphone App and allows users to remotely monitor and control the Ryobi GDO's status, for example by checking whether the garage door is open/closed and whether the light is on. *Id.*, ¶¶ 104-05. TTI markets this feature as "mak[ing] your garage smart." Stiteler Decl., Exhibit D, p. 2.

GD200 App

III. ARGUMENT

"A plaintiff seeking a preliminary injunction must establish that he [or she] is likely to succeed on the merits, that he [or she] is likely to suffer irreparable harm in the absence of preliminary relief, that the balance of equities tips in his [or her] favor, and that an injunction is in the public interest." *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 20 (2008). "The purpose of a preliminary injunction is merely to preserve the relative positions of the parties until a trial on the merits can be held." *Univ. of Tex. v. Camenisch*, 451 U.S. 390, 395 (1981). The decision to award or deny a preliminary injunction is committed to the discretion of the district court. *Titan Tire Corp. v. Case New Holland, Inc.*, 566 F.3d 1372, 1375 (Fed. Cir. 2009). This Court has recognized the importance of granting preliminary injunctions where a proper showing is made, even in situations much less clear or egregious that the present one.[3]

[3] *See Scholle Corp. v. Rapak LLC*, 35 F. Supp. 3d 1005, 1015 (N.D. Ill. 2014) (granting preliminary injunction, even though balance of equities and public interest weighed only slightly in favor of an injunction); *Tuf-Tite, Inc. v. Fed. Package Networks, Inc.*, No. 14-CV-2060, 2014 WL 6613116 (N.D. Ill. Nov. 21, 2014) (granting preliminary injunction); *Abbott Labs. v. Sandoz, Inc.*, 500 F. Supp. 2d 807, 845 (N.D. Ill. 2007) (granting preliminary injunction, even though alleged infringer "submitted detailed

This is not a case where TTI was already in the market and added a small feature to its already existing product. *See, e.g., i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 840 (Fed. Cir. 2010) (affirming permanent injunction where the infringing feature was merely a small addition to an already existing product); *Techtronic*, 395 F. Supp. 2d at 724 (awarding injunction even though both companies were previously in the business of selling power tools). Here, TTI is using CGI's own innovations—at one of its largest customers—and the only way to "preserve the relative positions of the parties," *Univ. of Tex.*, 451 U.S. at 395, is to preliminarily enjoin TTI from infringing CGI's patented inventions.

A. CGI Has a Strong Likelihood of Success on the Merits

A likelihood of success on the merits is shown when a patent owner "demonstrate[s] that it will likely prove infringement of one or more claims of the patents-in-suit, and that at least one of those same allegedly infringed claims will also likely withstand the validity challenges presented by the accused infringer.'" *AstraZeneca LP v. Apotex, Inc.*, 633 F.3d 1042, 1050 (Fed. Cir. 2010) (internal quotations omitted). To overcome this showing, the alleged infringer must "raise[] a substantial question concerning infringement or validity." *Id.* A showing of a likelihood of success on the merits does not require that infringement be "proved beyond all question, or that there be no evidence supporting the viewpoint of the accused infringer." *H.H. Robertson, Co. v. United Steel Deck, Inc.*, 820 F.2d 384, 390 (Fed. Cir. 1987), *abrogated on other grounds by Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995).

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evidence that they would face severe hardship if it in fact turns out that this Court incorrectly granted a preliminary injunction and recall"), aff'd, 544 F.3d 1341 (Fed. Cir. 2008) ; *Techtronic Indus. Co. v. Chervon Holdings, Ltd.*, 395 F. Supp. 2d 720, 737 (N.D. Ill. 2005) (granting preliminary injunction, even though the balance of hardships "weigh[ed] only slightly in favor of [the patentee]"); *Garvey Corp. v. Barry-Wehmiller Design Grp., Inc.*, 365 F. Supp. 2d 893 (N.D. Ill. 2005) (granting preliminary injunction).

Here, as shown below, the infringement analyses for the ’966 and ’275 patents are straightforward, demonstrating a strong likelihood that CGI will prove that the Ryobi GDO infringes its patents. Moreover, there are no substantial questions relating to infringement, validity or enforceability. Thus, this factor weighs heavily in favor of granting a preliminary injunction.

1. The Ryobi GDO and ONE+ Battery Infringe at Least Claims 9 and 14 of the ’966 Patent

TTI is liable under § 271(a) for making, importing to the United States, selling, and offering to sell Ryobi GDOs that infringe claims 9 and 14 of the ’966 patent. An infringement analysis has two steps: first, construing the asserted claims, and second, comparing the construed claims to the accused product. *Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1372 (Fed. Cir. 2005). Here, there are no terms in the first step that require construction because claims 9 and 14 of the ’966 patent use plain, understandable language and the Ryobi products infringe under any reasonable construction of these terms. *See* Rhyne Decl., ¶¶ 31 & 72-99 (Dr. Rhyne’s infringement analysis for the ’966 patent).

For the second step of the infringement analysis, CGI is submitting herewith the technical declaration of Dr. V. Thomas Rhyne, an expert in this field. Dr. Rhyne’s declaration explains in detail how TTI’s own materials demonstrate infringement and how Dr. Rhyne’s testing and analysis confirmed that the Ryobi GDO meets every claim limitation of the ’966 patent’s claims 9 and 14. Rhyne Decl., ¶¶ 72-99.

For example, Dr. Rhyne explains that the Ryobi GDO includes a “battery charging station” that is in electrical communication with “a rechargeable battery” (the Ryobi ONE+ battery) and with “a head unit” (the Ryobi GDO head unit, or the unit installed in the garage to physically open the garage door). Rhyne Decl., ¶¶ 79-87. The Ryobi GDO head unit is designed to supply power to the Ryobi battery which in turn provides backup power to the Ryobi GDO. Rhyne Decl., ¶¶ 82, 84-85, 94-97. The "battery charging station" of the Ryobi GDO accepts a Ryobi ONE+ battery designed to be "removably connectable" to "provide power" to "electronically powered equipment" such as Ryobi power tools. *Id.*, ¶¶ 88-93. Dr. Rhyne's declaration establishes that CGI is more than likely to succeed in showing infringement of the '966 patent's claims 9 and 14.

2. The Ryobi GDO Infringes at Least Claims 1 and 5 of the '275 Patent

TTI is also liable under § 271(a) for making, importing to the United States, selling, and offering to sell Ryobi GDO garage door openers that infringe claims 1 and 5 of the '275 patent. Again, claim construction is not necessary, because the claim terms are written in plain, understandable language and the Ryobi GDO infringes claims 1 and 5 under any reasonable construction. *See* Rhyne Decl., ¶¶ 31, 100-136 (Dr. Rhyne's infringement analysis for the '275 patent).

Dr. Rhyne explains how the Ryobi GDO satisfies every element of the '275 patent's claims 1 and 5. Rhyne Decl., ¶¶ 100-136. For example, Dr. Rhyne explains that the Ryobi GDO is a "movable barrier operator" that includes a "controller" (a printed-circuit board) "having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states" (for example, relating to the position of the door, the status of the light, and the status of the battery being charged). Rhyne Decl., ¶¶ 100-107. The Ryobi GDO includes a "wireless status condition data transmitter" (an RF chip and antennas) that transmits a signal that "corresponds to a present operational status condition defined, at least in part, by at least two operating states" (for example, a signal sent to a cell phone running the Ryobi app that corresponds to door OPEN or CLOSED, LED ON or OFF). Rhyne Decl., ¶¶ 111-114. The signal also "comprises an identifier that is at least relatively unique to the movable barrier operator" (for example, the unique MAC identifier for the Wi-Fi communications). Rhyne Decl., ¶¶ 118-122. With respect to claim 5, Dr. Rhyne explains how the Ryobi GDO includes many of the recited operational states, while claim 5 only requires inclusion of "at least one of" the recited states. Rhyne Decl., ¶¶ 124-136. Dr. Rhyne's declaration establishes that CGI is very likely to succeed in showing infringement of the '275 patent's claims 1 and 5.

3. There Are No Substantial Questions as to the Validity or Enforceability of the CGI Patents

The '966 and '275 patents are presumed valid under 35 U.S.C. § 282. To overcome the strong showing of infringement here, TTI has the burden to identify "persuasive evidence of invalidity." *Canon Comput. Sys. v. Nu-Kote Int'l, Inc.*, 134 F.3d 1085, 1088 (Fed. Cir. 1998) (alleged infringer must "identify any persuasive evidence of invalidity, [or] the very existence of the patent satisfies [movant's] burden on the validity issue"). TTI will not be able to present a reasonable challenge to the validity or enforceability of either CGI patent.

The presumption of validity of a patent is bolstered by any evidence of commercial success, industry praise, and copying. *L.A. Gear, Inc. v. Thom McAn Show Co.*, 988 F.2d 1117, 1124 (Fed. Cir. 1993). And "objective indicia may often be the most probative and cogent evidence of nonobviousness in the record." *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1378 (Fed. Cir. 2012) (internal quotations omitted)); *see also Techtronic*, 395 F. Supp. 2d at 734 (weighing secondary considerations against a finding of obviousness). Here, the presumption of validity for the '275 patent is bolstered by the tremendous commercial success and industry praise that CGI has achieved with respect to its MyQ® garage door openers that embody the technology claimed in the '275 patent. Fitzgerald Decl., ¶¶ 8-9; Rhyne Decl., ¶ 56. Additionally, the presumption of validity for the '966 patent is bolstered by the fact that TTI copied CGI's idea to create a product that embodied '966 patent's claims. *See supra,* Section II.C.

B. CGI Is Likely to Suffer Irreparable Harm Based on TTI's Infringement

CGI is likely to suffer irreparable harm in the absence of preliminary relief. Irreparable harm can take on a number of different forms, including without limitation lost market share, price erosion, lost goodwill, and lost downstream sales. *See Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d 1142, 1151 (Fed. Cir. 2011); *Celsis In Vitro, Inc. v. CellzDirect, Inc.*, 664 F.3d 922, 930 (Fed. Cir. 2012); *Apple Inc. v. Samsung Elecs. Co.*, 809 F.3d 633, 645 (Fed. Cir. 2015) ("*Apple II*") (discussing how a patentee's lost sales can lead to fewer accessory sales and fewer customer recommendations of the product, resulting in a harm that cannot be quantified).

In fact, in a case like this where TTI is selling a product in direct competition with CGI's same product in [redacted] irreparable harm is all but inevitable. Home Depot sells the Ryobi product right alongside the CGI product and even advertises and promotes the Ryobi product when consumers search Home Depot for garage door openers. Stiteler Decl., ¶¶ 18-20; Fitzgerald Decl., ¶ 10, 14-15 (TTI is directly competing with CGI [redacted]; *id.* at ¶¶ 11, 14 (TTI's infringement puts at risk [redacted].

The Federal Circuit explains:

> Competitors change the marketplace. Years after infringement has begun, it may be impossible to restore a patentee's (or an exclusive licensee's) exclusive position by an award of damages and a permanent injunction. Customers may have established relationships with infringers. The market is rarely the same when a market of multiple sellers is suddenly converted to one with a single seller by legal fiat. Requiring purchasers to pay higher prices after years of paying lower prices to infringers is not a reliable business option.

Polymer Technologies, Inc. v. Bridwell, 103 F.3d 970, 975-976 (Fed. Cir. 1996); *see also Douglas Dynamics, LLC v. Buyers Prods. Co.*, 717 F.3d 1336, 1345 (Fed. Cir. 2013) (holding in a case where the patentee and accused infringer had only 65% of the market: "[w]here two companies are in competition against one another, the patentee suffers the harm—often irreparable—of being forced to compete against products that incorporate and infringe its own patented inventions").

Though companies other than CGI make and sell GDOs, through CGI's innovation and investments in its reputation and quality of products, CGI has earned an estimated [redacted] share of the U.S. residential garage door opener market, effectively creating a two player market: CGI and everyone else. Fitzgerald Decl., ¶ 12; see *Polymer Techs.*, 103 F.3d at 975 ("The fact that other infringers may be in the marketplace does not negate irreparable harm. A patentee does not have to sue all infringers at once. Picking off one infringer at a time is not inconsistent with being irreparably harmed."). Courts have found that this type of market "may well serve as a substantial ground for *granting* an injunction—e.g., because it creates an inference that an infringing sale amounts to a lost sale for the patentee." *Bosch*, 659 F.3d at 1151; *Hydrodynamic Indus. Co. v. Green Max Distributors, Inc.*, No. 2:12-CV-05058-ODW, 2014 WL 2740368, at *3 (C.D. Cal. June 16, 2014) ("Evidence of a two-player market in which the patent holder is a direct-market competitor of the accused infringer serves as significant proof of irreparable harm.").

Without an immediate injunction, not only will CGI be put in the untenable position of being forced to compete in the very same physical and online stores against products that "incorporate and infringe its own patented inventions," *Douglas Dynamics*, 717 at 1345, it will be forced to compete against a product that bears the Ryobi brand that appears on hundreds of other products sold and advertised by Home Depot. Stiteler Decl., Exhibit M; Fitzgerald Decl., ¶¶ 13-16, 18-21. CGI will also be forced to compete for consumers who have already established loyalty to the Ryobi brand through its other product lines and/or who are persuaded by TTI's marketing of its GDO as compatible with the power tools they already have in their garages.

Additionally, in the short time the Ryobi GDO has been on the market, CGI has already suffered actual harm through lost market share and harm to CGI's good will and reputation. CGI is also likely to suffer lost downstream sales, price erosion, and loss in revenue needed to maintain its level of innovation and its skilled employee base. Further, allowing such infringement to continue devalues CGI's many inventions and suggests to others that the market is open to new entrants who may also be infringing. *See Pittway Corp. v. Black & Decker (U.S.), Inc*., 667 F. Supp. 585, 592 (N.D. Ill. 1987) (allowing the infringing sales to continue "will encourage others to copy Pittway's invention and flood the market with infringing products without fear of being stopped by a prompt injunction").

CGI is already losing sales and market share. The Ryobi GDO is offered at a lower price point than its comparable CGI model, and CGI will either need to lower its pricing or face a further loss in sales and reputational damage. *See* Fitzgerald Decl., ¶¶ 19-21. [redacted] Fitzgerald Decl., ¶¶ 9, 19-20; *see also* Stiteler Decl., ¶¶ 23-26. CGI is put in the untenable position of either alienating customers and losing revenue by maintaining current pricing or dropping prices during the period of infringement, not only causing a diminution in current revenue but making it difficult or impossible to raise prices later, and eroding CGI's ability to invest in further innovation. Fitzgerald Decl., ¶¶ 21-22; *see, e.g.*,

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Sanofi-Synthelabo v. Apotex, Inc., 470 F.3d 1368, 1382 (Fed. Cir. 2006); *Bosch*, 659 F.3d at 1154; *Celsis in Vitro*, 664 F.3d at 930.

Moreover, this Court should grant an injunction against TTI to prevent CGI from suffering the irreparable harm of being forced to bring suit against its customers to protect its patented invention. *Techtronic Indus. Co. v. Chervon Holdings, Ltd.*, 395 F. Supp. 2d 720, 736 (N.D. Ill. 2005) (explaining that "[t]he resulting harm to [the patentee's] business relationship with Sears would be difficult to compensate through monetary measures"). Indeed, Techtronic Industries Co.— a defendant in this case—succeeded in obtaining an injunction against a competitor in the Northern District of Illinois under analogous facts. *See id.*

Additionally, even a current diminution in revenue in the short term will cause irreparable harm because CGI will need to make tough choices on whether to cut investments into its innovation programs which are the lifeblood of the company. Fitzgerald Decl., ¶¶ 4-5, 22. [redacted] *See, e.g., Bio-Technology Gen. Corp. v. Genentech, Inc.*, 80 F.3d 1553, 1566 (Fed. Cir. 1996) (recognizing irreparable harm based on a reduction of funds available for research and development).

TTI's improper use of the '275 patent's technology also harms CGI's ability to attract future customers. [redacted] Fitzgerald Decl., ¶ 17. As such, each infringing Ryobi GDO sale eliminates the likely word-of-mouth recommendation to the lost customer's

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[4] *See* Rhyne Decl., ¶ 56-71 (explaining how CGI's HD950WF, and connected or connectable garage door openers meets every claim element of the '275 patent's claims 1 and 5).

friends, families, and neighbors. This loss harms CGI in a way that is impossible to measure or compensate for with monetary damages. Fitzgerald Decl., ¶ 17.

TTI's infringement also harms CGI's position in the market for accessories related to garage door openers. Garage door openers are often purchased with transmitters or extension kits. Fitzgerald Decl., ¶ 16. CGI's top-selling Home Depot accessory (its universal GDO clicker remote) is not compatible with the Ryobi GDO, and CGI's revenues for this product (amounting to approximately [redacted] over the last three years) are at risk based on TTI's infringement. Fitzgerald Decl., ¶ 16; *see also* Stiteler Decl., ¶¶ 23-26.

Even if it weren't for the many harms addressed above, CGI would be irreparably harmed merely from losing its right to exclude TTI's infringing product from the market—a loss of rights that forces CGI *to compete against its own patented inventions*. *See Black & Decker Inc. v. Robert Bosch Tool Corp.*, No. 04 C 7955, 2006 WL 3446144, at *3 (N.D. Ill. Nov. 29, 2006) (the "nature of the patent grant weighs against holding that monetary damages will always suffice to make the patentee whole") (quoting *Reebok Int'l, Ltd. v. J. Baker, Inc*., 32 F.3d 1552, 1557 (Fed. Cir. 1994)); *Apple II*, 809 F.3d at 650 (Reyna, J., concurring). The fact that CGI does not currently market a product that practices the '966 patent does not lessen this harm. "[A] party that does not practice the asserted patent may still receive an injunction when it sells a competing product." *Trebro Mfg. v. FireFly Equip., LLC*, 748 F.3d 1159, 1171 (Fed. Cir. 2014) (noting that the fact that a competitor movant "does not *presently practice* the patent does not detract from its likely irreparable harm" (emphasis added)). This is particularly true here, where it was TTI's own actions that prevented CGI from successfully marketing products that practice the '966 patent. *See supra*, Section II.C.

Ryobi cannot argue that any of the aforementioned harms are not caused by their infringement as they themselves advertise the infringing features, the infringing ONE+ battery feature and wireless status monitoring, to sell their products. *See* Stiteler Decl., Exhibit D, p. 2, 4-5; *see Apple II*, 809 F.3d at 642 (nexus when "the patented features impact consumers' decisions to purchase the accused devices"; patented features do not have to be the "exclusive or predominant reason why consumers" buy the infringing product).[5] TTI also ties the Ryobi GDO's "advanced technology" to features like the Ryobi GDO's infringing rechargeable battery and its smartphone app. Stiteler Decl., Exhibit D, p. 5.

Indeed, TTI has itself already admitted that the infringing Ryobi ONE+ battery backup feature drives sales of compatible products. *See* Stiteler Decl., Exhibit R, p. 11 (Techtronic Annual Report 2011) (ONE+ system drives sales with its "loyal following of end-users who keep coming back for the latest ONE+ System® product offerings"); Ex. Q, p. 20 (Techtronic Annual Report 2006) (ONE+ system "will drive future growth in our key retail partners across the globe").[6]

Though "it is impossible to determine the portions of the market the patent owner would have secured but for the infringer or how much damage was done to the patent owner's brand recognition or good will due to the infringement,"[7] here not only does TTI tout the infringing features, but third party garage door opener reviews are also already praising the infringing

[5] *See also Apple Inc. v. Samsung Elecs. Co.*, 735 F.3d 1352, 1364 (Fed. Cir. 2013) ("*Apple I*") (explaining that there are a "variety of ways" to show causal nexus, including "evidence that a patented feature is one of several features that cause consumers to make their purchasing decisions" or "that the inclusion of a patented feature makes a product significantly more desirable"); *id.* (It is not necessary to show that "one of the patented features *is the sole reason* consumers purchased [the infringing] products.").

[6] The importance of the '966 patent is further buttressed by the fact that TTI copied the battery backup feature for its infringing product from TTI's prior dealings with CGI. *See supra*, at Section II.C; *see also* Stiteler Decl., Exhibit A (TTI's abandoned attempt to patent CGI's technology); *Apple*, 809 F.3d at 643 (considering evidence of copying in establishing a causal nexus).

[7] *Black & Decker Inc.*, 2006 WL 3446144, at *4 (internal quotations omitted).

backup battery feature and the infringing status updates through the wireless app. Stiteler Decl., Exhibit F, pp. 4, 8-9, 13; Exhibit J, p. 2; Exhibit K, p. 2.

Indeed, online commenters and users of the Ryobi GDO are already focusing on the infringing features in the Ryobi GDO as key selling points for the product. These reviews frequently discuss the high value of the battery backup feature (and its interchangeability with Ryobi ONE+ batteries), showing that this feature "cause[s] consumers to make their purchasing decisions" and "makes [the] product significantly more desirable." *Apple I,* 735 F.3d at 1364. For example, commentators call the battery backup feature "great – especially so if you already own Ryobi cordless tools" (Stiteler Decl., Exhibit K, p. 5); "a genius idea" (*id*., Exhibit G, p. 2); and "awesome" (*id*., Exhibit G, p. 3). In explaining why he wished to purchase the Ryobi GDO, another commenter wrote that "I'm a 18v Ryobi guy so that makes it even better for me. . . . the 18v battery backup seals the deal." (*id.*, Exhibit J, p. 8); *see also id.*, Exhibit L, p. 5 ("I really like that battery backup and I've got a bunch of Ryobi batteries."); *id*., Exhibit G, p. 12 ("Great idea to make the battery backup not only replaceable, but . . . also a charger and . . . common with Ryobi power tools!"); *id*., Exhibit I, p. 2 ("[T]he fact the battery backup is a Ryobi batter[y] it just makes things simple to deal with.").

Commenters similarly value the infringing Ryobi GDO wireless status update feature. One described the ability to control your garage door from your phone as "(arguably) the biggest feature for developing a smart garage door opener." *Id*., Exhibit G, p. 13-14. Others stated: "the app is gonna be super useful!" (*id*., Exhibit I, p. 7) and "That app seems really useful feature wise, I wish my garage doo[r] could tell me if it was left open." (*id*., Exhibit I, p. 9). Another commenter wrote that a smart app capable of monitoring the status of the door was "the most important feature[] for me." *Id*., Exhibit K, p. 7.

There is more than ample evidence to support a finding that CGI is likely to be irreparably harmed by TTI's infringement.

C. The Equities Weigh Heavily in Favor of an Injunction

The equities also weigh heavily in favor of a preliminary injunction. CGI has made substantial investments into R&D for its patented technology. Fitzgerald Decl., ¶¶ 5, 22. Such investments are strong factors favoring a preliminary injunction. *See MGM Well Servs., Inc. v. Mega Lift Sys., LLC*, No. CIV.A. H-05-1634, 2005 WL 1693152, at *5 (S.D. Tex. July 19, 2005), aff'd, 264 F. App'x 900 (Fed. Cir. 2008) (finding equities favored patentee who had "invested substantial financial and other resources over the past few years to develop its patented [system] and to build a market for it"); *John Fluke Mfg. v. North America Soar*, 5 U.S.P.Q.2d 1657, 1662 (D.N.J. 1987) (finding equities favored plaintiff who had invested in R&D, manufacturing facilities, and workforce to produce and market its product). Moreover, CGI's business model over the past five decades has focused on providing high quality, safe, and innovative garage doors openers, Willmott Decl., ¶¶ 4-7, and today such products comprise approximately [redacted] of CGI's business in the Americas. Fitzpatrick Decl., ¶ 7; *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 862–63 (Fed. Cir. 2010) (finding that balance of hardships favored patentee, where "the patented technology [was] central to [the patentee's] business," while the infringing product was "only a small fraction of [the alleged infringer's] sizeable business"). Seeking to protect these established investments and minimize the harms mentioned, CGI has pushed to quickly file suit and move for a preliminary injunction.

TTI, on the other hand, has no comparable investment at stake. TTI is just entering the market and, instead of investing money into research and development, opted to copy CGI's patent technology. In fact, TTI did not invest in manufacturing, choosing instead to engage a manufacturer to copy CGI's innovations and then import those products from China into the

United States. *Tuf-Tite, Inc. v. Fed. Package Networks, Inc.*, No. 14-CV-2060, 2014 WL 6613116, at *9 (N.D. Ill. Nov. 21, 2014) (noting that party's recent entry to the market weighed against it); *Cornucopia Prods., LLC v. Dyson, Inc.*, No. CV 12-00234-PHX-NVW, 2012 WL 3094955, at *10 (D. Ariz. July 27, 2012) (finding equities weighed in favor of patentee that had "invested substantial resources in developing its patented design and bringing its [product] to market," while the alleged infringer had "slavishly copied [the patentee's product], including the infringing design feature"). Additionally, TTI sells a diverse range of products—including drills, pressure washers, lawn mowers, table saws, pressure washers, blowers, etc.—and its viability will not be threatened if sales of its infringing garage door openers are enjoined. Stiteler Decl., Exhibit S, p. 3-5.; *i4i*, 598 F.3d at 862–63; *Garvey Corp. v. Barry-Wehmiller Design Grp., Inc.*, 365 F. Supp. 2d 893, 900 (N.D. Ill. 2005) (reasoning that equities weigh against an alleged infringer that "manufactures more than just [the infringing product] so a preliminary injunction is unlikely to devastate the company").

Moreover, any hardship that TTI faces is self-inflicted. TTI entered this market with its eyes wide open, aware that it was improperly copying CGI's inventions for its own gain. Nor can TTI allege that it will be harmed by an injunction—"[o]ne who elects to build a business on a product found to infringe cannot be heard to complain if an injunction against continuing infringement destroys the business so elected." *Bosch*, 659 F.3d at 1156 (quoting *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1003 n.12 (Fed. Cir. 1986)); *i4i*, 598 F.3d at 863 ("[N]either commercial success, nor sunk development costs, shield an infringer from injunctive relief. . . . [The infringer] is not entitled to continue infringing simply because it successfully exploited its infringement."). This factor weighs heavily in CGI's favor.

D. The Public Interest Weighs Heavily in Favor of an Injunction

The fourth and final factor—the public interest—also weighs heavily in favor of an injunction. As the Supreme Court has recognized, "[t]he patent laws promote . . . progress by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development" needed to create a new product and bring it to the market. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974). The public's interest in protecting property rights stems from "the importance of the patent system in encouraging innovation." *Sanofi-Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1383 (Fed. Cir. 2006). Indeed, the "encouragement of investment-based risk is the fundamental purpose of the patent grant, and is based directly on the right to exclude." *Id.* (citation omitted). "As a result, the public interest nearly always weighs in favor of protecting property rights in the absence of countervailing factors." *Apple II*, 809 F.3d at 647. These principles are particularly true here where CGI markets a product that embodies the '275 patent and has attempted to market a product that embodies the '966 patent.

In addition, and as outlined in the Willmott Decl., ¶¶ 8-17, CGI has long held itself out as an innovator in this industry, particularly in areas relating to GDO safety. Not granting CGI's motion may in fact stymie further innovation of these products, innovation that has improved the quality and safety of products in use around the world on a day-to-day basis.

IV. CONCLUSION

For the reasons set forth above, this Court should enter a preliminary injunction barring TTI from infringing claims 9 and 14 of the '966 patent and claims 1 and 5 of the '275 patent.

HIGHLY CONFIDENTIAL OUTSIDE ATTORNEYS' EYES ONLY MATERIAL
SUBJECT TO PROTECTIVE ORDER

Dated: June 10, 2016

By: */s/ Nicole L. Little*

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ATTORNEYS FOR PLAINTIFF
THE CHAMBERLAIN GROUP, INC.

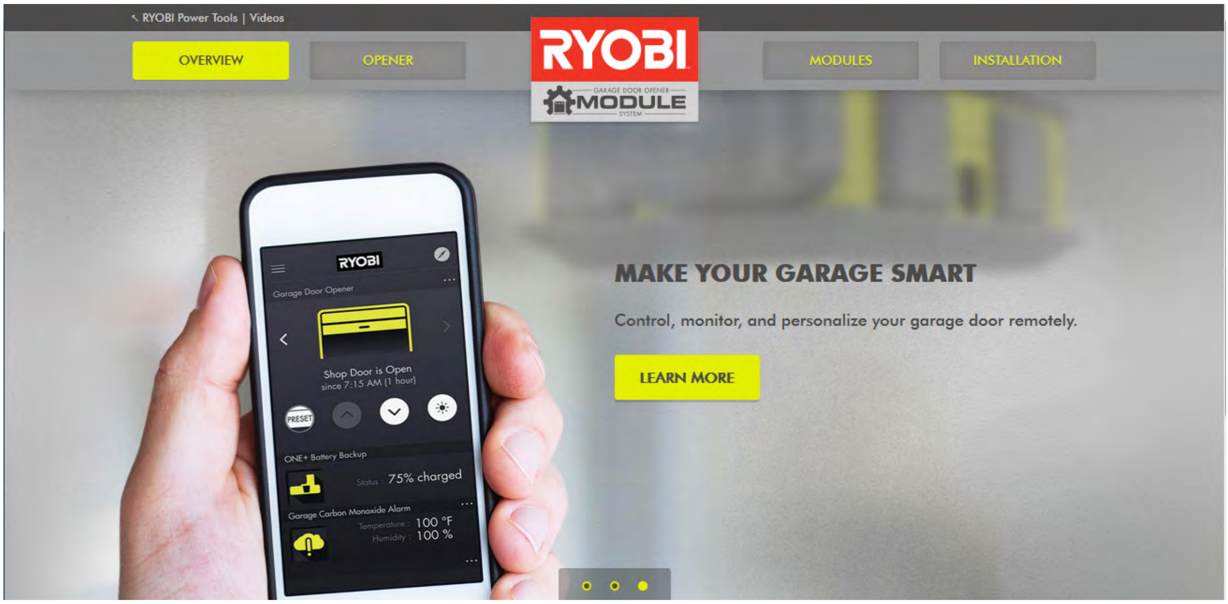
3. Attached as Exhibit A is a true and correct copy of U.S. Patent App. No. 12/426,356 ("the '356 Application"), published as Patent Pub. No. US2010/0156182, as obtained from the U.S. Patent and Trademark Office ("PTO") website, www.uspto.gov, on May 16, 2016. The '356 Application is entitled "Garage Door Opener With Secondary Power Source" and the application indicates that it was filed with the PTO on April 20, 2009. The face of the '356 Application identifies that it is based on a provisional application that was filed on December 19, 2008.

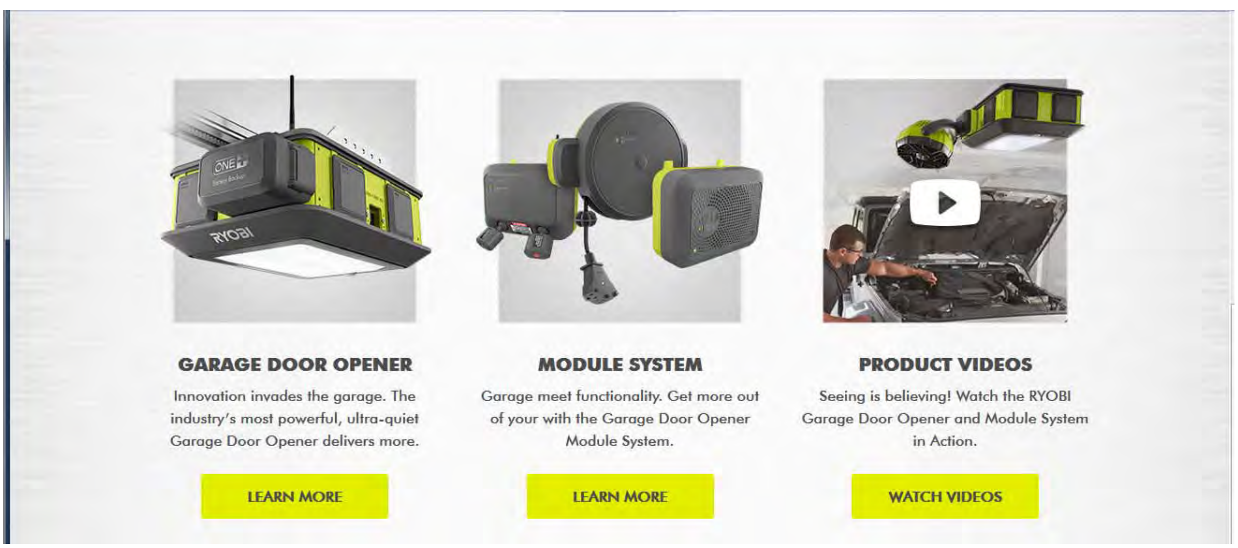
4. Attached as Exhibit B is a true and correct copy of the Office Action, dated May 16, 2011, for the '356 Application, as obtained from the PTO website, www.uspto.gov, on May 16, 2016. In this Office Action, the examiner issued a non-final rejection of all claims of the '356 Application.

5. Attached as Exhibit C is a true and correct copy of the Notice of Abandonment, dated February 28, 2012, for the '356 Application, as obtained from the PTO website, www.uspto.gov, on May 16, 2016.

6. Attached as Exhibit D are true and correct excerpts from the Ryobi GD200 garage door opener ("Ryobi GDO") website, obtained from http://www.ryobitools.com/gdo/opener/ and http://www.ryobitools.com/power-tools/products/details/802 on June 5, 2016, and Ryobi's ONE+ System website, obtained from http://www.ryobitools.com/power-tools/products/list/family/one-plus on June 5, 2016.

7. Attached as Exhibit E are true and correct excerpts of the LinkedIn page for Brian Mertel, described as Senior Director of Product Management at Techtronic Industries Power Equipment, as obtained from http://www.linkedin.com/in/brian-mertel-3650051a on June 6, 2016.


RYOBI Power Tools | Videos
OVERVIEW
OPENER
RYOBI
MODULE
MODULES
INSTALLATION
RYOBI
Garage Door Opener
Shop Door is Open
since 7:15 AM (1 hour)
PRESET
ONE+ Battery Backup
75% charged
Garage Carbon Monoxide Alarm
100 °F
100 %
MAKE YOUR GARAGE SMART
Control, monitor, and personalize your garage door remotely.
LEARN MORE


GARAGE DOOR OPENER
Innovation invades the garage. The industry's most powerful, ultra-quiet Garage Door Opener delivers more.
LEARN MORE
MODULE SYSTEM
Garage meet functionality. Get more out of your with the Garage Door Opener Module System.
LEARN MORE
PRODUCT VIDEOS
Seeing is believing! Watch the RYOBI Garage Door Opener and Module System in Action.
WATCH VIDEOS

Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=0&f=S&l=50&TERM1=colin&FIELD1=INNM&co1=AND&TERM2=willmott&FIELD2=INNM&d=PTXT on June 8, 2016).

2. I submit this declaration in support of CGI's Motion for Preliminary Injunction barring the defendants from making, using, selling, offering for sale, or importing to the United States garage door openers that infringe U.S. Patent Nos. 7,635,966 ("the '966 patent") and 7,224,275 ("the '275 patent").

3. CGI traces its roots back to 1906 when Chamberlain Machine Works was founded by Andrew Chamberlain as Waterloo Rope Belt Company. The company manufactured rope belt products which were used on large power cream separators in creameries and later in gas engines and pump jacks for use on farm windmills. In 1929, the company was incorporated in Iowa as Chamberlain Corporation. *See* Exhibit B (taken from: http://www.duch.com/about/our-history/ on June 8, 2015). The following picture is included in Exhibit B:

4. In 1968, CGI acquired Perma Power Corp. out of Chicago. I was working as a Project Engineer at Perma Power at the time.

5. Perma Power was founded in 1955 with around fifty employees. I joined the company in 1961 as a Junior Engineer. Perma Power introduced our first garage door opener

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(GDO) radio controls in 1956 and our first garage door opener in 1958. *See* Exhibit C (taken from: http://webcache.googleusercontent.com/search?q=cache:http://www.dasma.com/pdf/publications/pagesofhistory/chambrl-spr2003.pdf on June 8, 2016).

6. In 1960, Perma Power began selling GDOs to Sears and introduced the industry's first transistorized radio controls for GDOs. *See* Exhibit C.

7. In 1967, Chamberlain moved its corporate offices to Elmhurst, Illinois, the location of CGI's present day corporate headquarters. In 1967, Perma Power introduced the LiftMaster® brand of garage door openers and accessories, a product which I helped develop. In 1968 CGI acquired Perma Power and continues to this day to sell LiftMaster® GDOs, which are CGI's best-selling product. I started working for CGI as part of the acquisition. *See* Exhibit C.

8. CGI is a leader in the garage door opener market, with a number of "firsts," many of which I was proud to play a role in. For example, in 1975, CGI introduced the world's first digital radio controls for GDOs, with 512 codes set by DIP (Dual Inline Package) switches and, in 1989, introduced the industry's first wireless keyless entry system. Prior to this, all garage keypad type door controls had to be hard-wired to the head unit of the garage door. There were no "clickers" and no way to remotely open a garage door except by a portable transmitter from a car. *See* Exhibit C.

9. CGI, in 1979, introduced the first infrared sensors for residential garage doors openers. The purpose of these sensors was to detect objects such as children who might be under a garage door as it is closing and in harm's way. The sensors were used, and are used today, to reverse the direction of the garage door to avoid harm. *See* Exhibit C.

10. In addition to the industry "firsts" noted above, our LiftMaster® products had the first:

a. Battery backup unit (promoting safety and convenience by allowing the opening and closing of the garage door in the event of power failures);

b. Battery backup unit integrated into the GDO (or the GDO head unit – the box that is installed above the vehicle in the garage and which contains the controls and motors to lift the garage door);

c. Motion detection control panel (promoting safety and convenience by, for example, detecting motion turning on the garage lights when someone enters the garage);

d. Adjustable light delay (which maintains the lighting in the garage for an adjustable period of time after the garage door is opened or shut);

e. Remote control for GDO light;

f. Learning receiver (i.e., a receiver that allows a consumer's clicker to learn the code for that person's particular garage door opener) required for the wireless keypad);

g. Rolling code in all GDO's (promoting security by changing the code to the GDO each time the garage door opener clicker is depressed, ensuring that thieves can't capture the code and later open the garage door);

h. Motion Vibration Isolation System (MVIS®) for reducing vibration and noise;

i. Advanced Trolley System (that provides lockout for manual door operation);

j. Radio Frequency lock on the wall panel (promoting security by allowing consumers to lock out any remote transmitters and permit access only through wall panel);

k. Maintenance Alert System (which flashes a light on the control station when maintenance of the GDO is required);

l. Integrated Transistor Portable Transmitter (that allowed for miniature transmitters that fit on the car sun visor);

m. Garage Door Monitor (promoting safety by allowing consumers to monitor the status of their garage doors and to receive alerts);

n. Posi-lock system (promoting safety by electronically securing a closed door and monitoring against the door ever being manually forced opened);

o. Residential jackshaft operator (that eliminated the rail and chain that was mounted above the door); and

p. Internet-enabled garage door opener.

11. In addition, CGI was the first in the industry to use a light delay timer, printed circuit board, electronic logic board, Digital Radio Control, customer settable coding system, and Integrated Circuits. CGI was the first to introduce a billion code system so that no two transmitters are coded alike.

12. Not only has CGI made a substantial investment over decades innovating for its own products and customers, but CGI, and I personally, have lobbied for legislative reform to keep consumers at large safe.

13. For example, from March 1982 to October 1992, there were numerous deaths and injuries to children under the age of 15 caused by GDOs. One report by the Consumer Product

States garage door openers that infringe U.S. Patent Nos. 7,635,966 ("the '966 patent") and 7,224,275 ("the '275 patent").

3. CGI develops, manufactures, and sells innovative access control devices, including residential garage door openers, commercial door operators, perimeter access solutions, home connectivity products, and related accessories. Since CGI acquired Perma Power in 1968, CGI has created numerous jobs in the United States and in this District. CGI currently employs over [redacted] employees in this District, including employees involved in research, product development, engineering, and testing carried out in four different facilities in Elmhurst, Illinois, and at least [redacted] employees nationwide.

4. CGI has made and continues to make substantial investments in the U.S. In 2015, [redacted]

5. CGI invests significant amounts of money into research and development for its products. [redacted]

6. Based at least in part on this research and development, CGI's products have a reputation for safety, security, connectivity, and reliability, and CGI has received accolades as an

CONFIDENTIAL MATERIAL REDACTED FROM PAGE

innovation leader in its field of technology. I attached as Exhibit B a number of third party reviews and accolades of CGI's technology.

7. CGI is currently the market leader in the field of residential garage door openers in the United States. For example, CGI's LiftMaster® products, the leading brand of professionally installed garage door openers in the United States, and CGI's do-it-yourself Chamberlain® products are present in a majority of residential garages in America. Today, tens of millions of U.S. households have CGI's GDOs (LiftMaster®, Chamberlain®, and private labeled GDOs) installed in their garages. [redacted]

8. CGI's MyQ® technology allows users to remotely monitor and control garage doors, lights, and gates in their homes and businesses with their smartphones. Products incorporating CGI's MyQ® technology have been particularly singled out for industry and consumer praise. I attached articles showing examples of this industry praise as Exhibit C.

9. CGI's MyQ® technology is not only highly praised; products incorporating this technology have also been commercially successful. For example, Model No. HD950WF, is one of CGI's best-selling WiFi units and one of CGI's top-grossing models in 2015. [redacted]

The Ryobi Garage Door Opener

10. None of the defendants ("TTI") were direct competitors with CGI before April 2016. Before then, TTI was not in the garage door opener space at all. TTI's new product the Ryobi GD200 garage door opener ("Ryobi GDO")—directly competes with CGI's products. The Ryobi GDO, like all Ryobi products, is sold exclusively at Home Depot and has been available in stores since approximately mid-April.

Ryobi's Product Has and Will Decrease CGI's Share of the Market

11. The demand for garage door openers is relatively inelastic, as it is necessarily limited by the number of garages. [redacted] Unlike items that consumers buy more than one of like consumables or like groceries, consumers only have a certain number of garage doors and only need, at most, one garage door opener per garage door. [redacted]

12. [redacted]

13. TTI's entrance to this market with the Ryobi GDO directly competes with CGI's products. As a result of this head-to-head competition, every sale of the Ryobi GDO is a potential lost sale of one of CGI's products. A sale CGI cannot make up because of the type of market for these products.

14. [redacted]

means CGI will make fewer sales to the customers' friends, families, and neighbors, harming CGI in a way that is impossible to measure.

18. Prior to the entrance of the Ryobi product into the marketplace (and at Home Depot), Home Depot promoted CGI's WiFi-enabled HD950WF garage door opener as part of its "connected" line of products. Now, Home Depot is not only promoting the Ryobi product as part of that line, but it is aggressively running advertisements that do not even mention the CGI products. For example, attached as Exhibit E are photographs of Home Depot's Father's Day advertising flyer, effective from June 9, 2016 to June 22, 2016. Attached as Exhibit F are photographs of Home Depot endcaps advertising the Ryobi GDO.

19. [redacted] The Ryobi GDO is priced at $248 at Home Depot. I attached as Exhibit G a Home Depot pricing page showing this price. The Ryobi GDO is advertised as having a 2HPS motor and features WiFi connectivity. CGI's comparable model at Home Depot (the HD950WF) has a list price in most markets of $268. *See* Exhibit H. The comparable CGI unit has a 1-1/4 HPS motor and features WiFi connectivity. The Ryobi GDO is being offered with sales incentives, including a free "accessory" with every sale.

20. [redacted]

EXHIBIT C

Index of Third-Party Awards and Praise for MyQ® Technology

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2014 MOBILE EXCELLENCE AWARDS

7th Annual Mobile Excellence Awards Proudly Announces its 2014 Winners

Industry Leaders Gathered to Honor the Best in Mobile Entertainment, Technology & Lifestyle

Los Angeles, CA – January 15th, 2015— The Mobile Excellence Awards honored industry leaders and rising stars at its annual gala, which took place on Tuesday, January 13th, at the recently inaugurated YouTube Space LA and sponsored by Hilton Worldwide, Intel and Fathom Events.

Now in its 7th year, the Mobile Excellence Awards is the only awards program in the industry of this caliber that recognizes and honors the companies that have truly set the bar of excellence in the technology industry. From leading brands to studios, carriers and startups, Mobile Excellence Award finalists and winners were celebrated by the industry's leading executives, influencers at an exclusive awards ceremony.

"We're very proud that our 7th year event was a stellar success," said MEA Board Member, Allison Dollar, CEO of the ITV Alliance. "Home run. This year's Mobile Excellence Awards hit the high benchmarks we set, not just for the MEA organization, but also in the level of innovation and achievement demonstrated by the finalists and winners. And our partners and sponsors were first rate, couldn't have asked for better. We congratulate all the winners who showed creativity and determination to better the future of the industry as a whole. We look forward to continuing to offer a place of recognition and leadership in gearing up for the next one."

The 7th Annual Mobile Excellence Awards are produced by Axis PR & Entertainment and Little Monster Media.

2014 Mobile Excellence Award Winners

Industry Star – AT&T

Mobile Ambassador – Brad Spahr, Vice President, Product Development, Global Digital Business at Sony Music Entertainment

Best Mobile Innovator – Hilton Worldwide, digital check-in and room selection

Best International – B2X Care Solutions, SMARTBAR

Best Retail/Commerce Solution for Mobile – Vodafone Mobile Wallet

Best Mobile Product – Intel Blackburn Tablet Design

Best Mobile Payment – Vodafone Mobile Wallet

Best Mobile Games – TinyCo – FAMILY GUY: The Quest for Stuff

Best Mobile Music – Sony Music Entertainment Album of the Day App

Best Entertainment Related Marketing Campaign – Office Depot Gotta Get Inspir5d: An Augmented Reality Experience

Best Original Content for Mobile – Vibes for Sauza, "Make it With a Cowboy" Campaign

Best Content Extension Made for Mobile – NBC Universal Syfy – Syfy Sync

Best Mobile Sports – Los Angeles Kings, Los Angeles Kings Mobile App

Best User Experience for Mobile – SocialNightlife Mobile App

Best Technology Breakthrough – Qualcomm Atheros – Qualcomm VIVE with Multi-User MIMO

Best Delivery Platform for Mobile – HP Aurasma

Best 2nd Screen Experience for TV on Mobile or Tablet – MHL Consortium / MHL 3.0

Best Mobile Video – AdColony

Best Mobile App for Home – Chamberlain, MyQ Garage

Best Mobile App for Health/Fitness – IHG/Even Hotels

Best Mobile Utility Application for a Smartphone or Tablet – Parallels, Parallels Access

Best Over-all Mobile App – E! Entertainment

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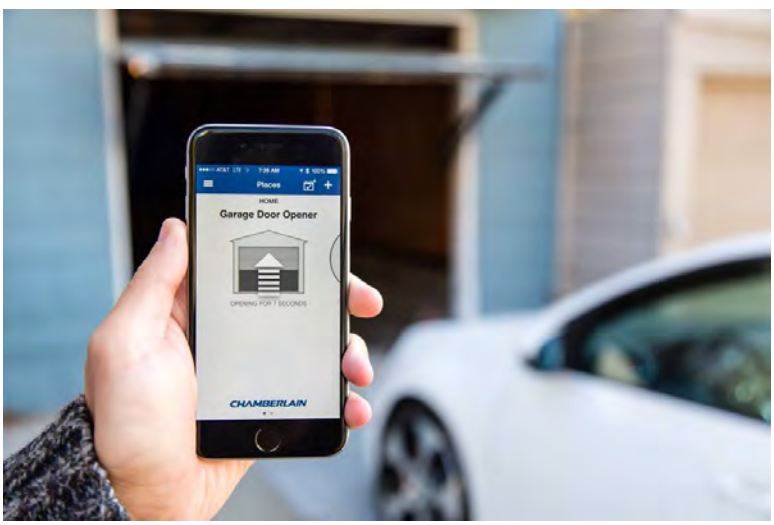
THE WALL STREET JOURNAL.

http://www.wsj.com/articles/review-why-a-smart-home-starts-in-the-garage-1433871673

TECH | PERSONAL TECH | PERSONAL TECHNOLOGY

Review: Why a Smart Home Starts in the Garage

Don’t laugh: Putting your garage door on the Internet makes your house safer and smarter



Chamberlain’s Wi-Fi garage door opener lets you operate the most important door in your house via an app, and also track whether it’s accidentally left open. *PHOTO: GEOFFREY A. FOWLER/THE WALL STREET JOURNAL*

By GEOFFREY A. FOWLER
June 9, 2015 1:41 p.m. ET

It's easy to take for granted what your garage door knows. That contraption doesn't do much other than open and close its greasy jaw.

Yet your garage is a gateway for more than just a car and assorted junk. It's probably the most-used door to your house. It sees when you're rushing off to work and knows when you're back from vacation.

Which is why I decided to hook my garage door up to the Internet.

I can see that eye roll. Yes, even garages are going online now, like the new $268 Chamberlain Wi-Fi Garage Door Opener I installed last month. It sounds geeky, but the garage plays a critical part in how our homes will become thoughtful. Having information about who's home is step one of automating a house when you connect its many parts, as Apple and Google are trying to do.

But my Internet garage door was also practical as soon as I installed it. With an app, my family can track comings and goings, and can close the door from halfway to the mall after someone has a senior moment.

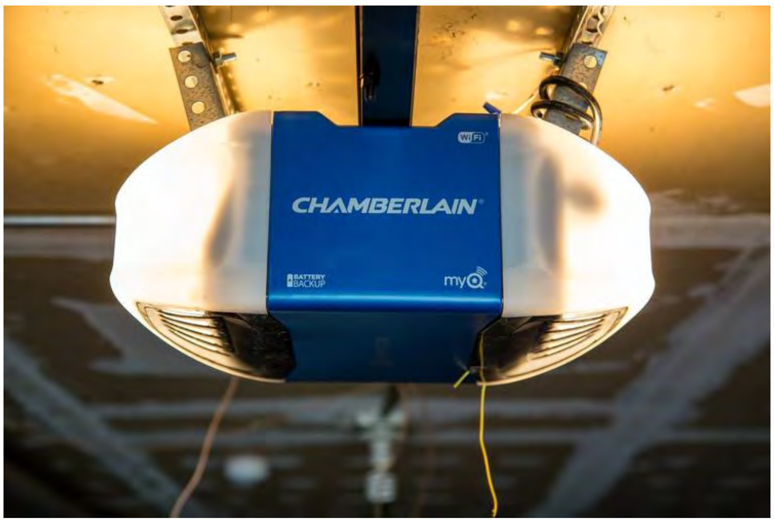
This smart home tech is finally at a point that's neither outrageously expensive nor complicated. My Wi-Fi-enabled door from Chamberlain, which also makes the popular LiftMaster brand, cost about $30 more than other quiet, unconnected models. If you don't need a replacement just yet, you can also buy adapters from Chamberlain ($130) and other companies like Insteon ($80) to retrofit existing doors. There's no need for some high-tech smart home hub. There are no ongoing fees.

(Smartening up the perimeter of your home is a big trend. I've previously reviewed doorbells with cameras and electronic deadbolts that use phones for keys.)

Once a pro installed my garage machinery, getting online took less than 10 minutes. The newest Chamberlain model comes with everything you need for Wi-Fi already built in—no dongles or add-on doodads required. It does require your wireless network to reach the garage, so you might need a new router or an extender if you live in big house (or have Wi-Fi-blocking walls).

When your garage door is online, your smartphone serves as a remote. An iPhone and Android app called MyQ lets you open and close the door with a tap. This is a convenience if you don't want to carry keys, or just can't find your clicker in your bottomless glove compartment.

That may sound mundane, but the Chamberlain also comes with a superpower: You can operate the door far away from home—say if you need to let a baby sitter in before the children get home, or let in a neighbor in to check on your house after a storm.



Chamberlain makes garage door openers, like this one, that have Wi-Fi capabilities built in. You can also buy attachments that add connectivity to older models. *PHOTO: GEOFFREY A. FOWLER/THE WALL STREET JOURNAL*

And if you forget to close the garage door, it can help, too. After a period of your choosing passes, up pops an alert. And now you can actually do something about it wherever you are.

For safety, before it closes via app, the Chamberlain garage door flashes lights and plays a warning tone for a few seconds. (Sadly, there's no disco ball option.) It works on most garages, but in some cases, like on old one-piece doors that swing out, Chamberlain warns you shouldn't operate the remote when you're not around.

Can this thing be trusted to keep hackers out? That sort of thing happens in spy films, but the bigger threat for now is probably ordinary crooks breaking a window or picking a lock. Still, you should take three security precautions before using one of these: Put password or thumbprint protection on your phone, lock down your home Wi-Fi network and choose a really strong password for the MyQ app. Anyone who gets your login and password could potentially open your garage with the app on their own phone.

(Chamberlain encrypts all the communication between the phone, door opener and its servers, but still ought to take the extra step of texting or emailing you when someone tries to log in on a new phone. The company says it's working on it.)

But taking orders from an app isn't what makes this garage smart. Its most important capability is status reports: Whenever it opens and closes, I get an alert on my phone. For parents keeping an eye on their herd, it's a lightweight way to know what's going on at home without resorting to creepy video cameras.

Chamberlain could make this even more useful by letting individual family members have their own logins—so it can report the difference between the dog walker and your minivan. They're also working on that for a software update.

And it gets better: The garage's status reports can also help you run the rest of your smart home.

At Apple's Worldwide Developers Conference on Monday, vice president of technology Kevin Lynch showed the next version of the Watch OS. A watch face widget from Insteon, lower left on the screen, could soon let you open your garage door from your wrist. *PHOTO: WILSON ROTHMAN/THE WALL STREET JOURNAL*

My Nest thermostat, for one, benefits from knowing my comings and goings as it tries to conserve energy. The popular learning thermostat, now owned by Google, can talk to the Chamberlain garage opener—just link their logins in the MyQ app. It uses the garage door info, along with other signals, to try to figure out when to blast the AC or turn it off. This is particularly helpful for people whose Nest thermostats can't sense activity in the house because they're installed away from the busiest hallways.

Chamberlain will soon begin selling a version of its Wi-Fi opener (and an adapter for older models) that will also work with Apple's HomeKit, the smart home tech built into iPhones and Apple Watches. This will let you ask Siri to open the garage, or pair with other hardware to, say, turn on some lights when you get home.

Connecting the appliances around your house to make them work together is the name of the game in the coming years. Nest, in particular, has its eyes on figuring out how to orchestrate all these connections into patterns that would make your house run without your intervention. The most important thing it needs to know is whether anybody is home or not. If you want to know why, just think of security cameras: They're great to have on when you're not home, but you don't want them spying on you.

Mike Soucie, who runs Nest's partnerships, told me the garage door will do more than just inform the thermostat—it's the kind of data that might help a home do everything from turning off lights to turning on dishwashers when there's no one home.

None of this is will be easy to get right. Just because one person leaves the garage doesn't mean the house is empty. "It's version one today," Mr. Soucie says, but "the more inputs or data points that we get to feed back into that system, the more accurate we can be."

In Nest's case, this means trusting Google, an advertising company, with a lot of information about your home and family. Nest says it runs as a separate company and doesn't share your home data with its parent company. So far. (Apple is designing its HomeKit system so that it never sees the data.)

You do get something in return for sharing your life with all these machines. It's already worth the nominal extra cost of Wi-Fi to know whether the largest door in your house is open—and being able to do something about it if it isn't. And in the future, it might just be the gateway to an automated home that really understands you and your family.

Write to Geoffrey A. Fowler at geoffrey.fowler@wsj.com or on Twitter @geoffreyfowler.

APPLE

Control your garage door from your smartphone with Chamberlain's MyQ Garage

With a universally compatible, iPhone-enabled garage door opener from Chamberlain, you'll never have to wonder if you left the garage door open again.

By Jordan Golson | July 14, 2014, 8:38 AM PST

The Internet of Things (IoT) continues to grow in home automation technology space, and some devices appear to be more useful than others.

An app-enabled slow cooker (http://www.cnet.com/products/crock-pot-wemo-smart-slow-cooker/)? OK, I guess. I can see the utility for some people. An app-enabled garage door opener? Now, that's something that's truly useful. That's exactly what we have with Chamberlain's $130 MyQ Garage (http://www.chamberlain.com/smartphone-control-products/myq-garage) system.

Some higher-end Chamberlain garage door openers — the company also makes openers under the LiftMaster name — included internet connectivity for a while, but the MyQ Garage, launched earlier this year, allows users to add app-enabled connectivity to most garage doors made after 1993, including those from Craftsman, Genie, LiftMaster, Stanley, and many more (compatibility chart (http://www.chamberlain.com/chamberlain/media/library/pdf/CGI_GarageDoorCompatability_v3_10-23-13.pdf)).

Thanks to an ingenious solution, the MyQ Garage doesn't require any changes be made to your existing garage door setup. There are two components. A base station installs with a pair of included screws on the ceiling near the main drive motor of the garage door opener. A second, smaller battery-powered box (about three inches square) attaches to the garage door with adhesive tape. This is the clever bit.

The door-mounted box has an accelerometer inside that knows when the garage door is open, closed, or when it's moving. All the base station does is send open/close commands to the door opener, similar to the remote control in your car.

A box checking to see if the door is open or closed is an elegant solution that saves homeowners (and renters) from needing to perform a costly and unnecessary garage door opener replacement. Instead, they simply to add their garage door to the IoT.

The companion app, available for iPhone and Android, is very simple. It can be set up with multiple garage doors or even a front gate or lighting, plus other locations for those who have a vacation home, for example.

On the front page of the app — which, handily, can be set to not ask for a password if desired — is an illustration of a garage door that shows the current state of the door (open, closed, in motion) and how long it has been in that state. **Figure A** shows that my door has been closed for some 15 hours.

The app shows that my door has been closed.

Simply tapping the door will send a command to either open or close it. It only takes a second or two for the door to respond, even if you're around the world.

Here's one interesting part — the opener, when it's trying close the door, emits a long series of beeps and flashes its on-board light repeatedly. This is because you may be hundreds of miles away from your door when it's trying to close, and if there are people in the garage, they may not expect the door to start moving. It's a warning of sorts, and — though it's annoying when you're in the garage — if you're closing the door from afar, it gives you some peace of mind that the thing won't just start moving and squish your neighbor.

The company also strongly recommends that users only use the system with garage doors equipped with obstruction sensors, made mandatory on all new systems in the early 90's. It also says the system should be used only on sectional doors, not larger and heavier one-piece doors.

Early reviewers have noted some difficulty in getting the system installed, but it appears Chamberlain has worked out most of the kinks as our system installed flawlessly in about 15 minutes. Any homeowner that's moderately handy can set up the MyQ quickly and easily.

Though it's annoying to need yet another app on our phones to control a home device, Chamberlain's app opens quickly, and the company is working with other device makers on partnerships.

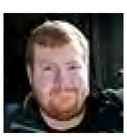
Chamberlain is adding "Works With Nest (http://www.techrepublic.com/article/nest-devices-can-now-talk-to-the-rest-of-your-house/)" support, allowing users of Nest Thermostats to automatically set their thermostat to Away mode when leaving the house.

The company was also announced as a HomeKit partner by Apple at WWDC last month, suggesting that garage door openers will be made part of Apple's integrated home automation platform when iOS 8 launches later this year.

The MyQ Garage is available for $130 (USD) from Chamberlain (http://www.chamberlain.com/smartphone-control-products/myq-garage/model-myq-g0201), Home Depot (http://www.homedepot.com/p/Chamberlain-MyQ-Garage-Universal-Smartphone-Controller-MYQ-G0201/204394627), Amazon (http://www.amazon.com/Chamberlain-MYQ-G0201-MyQ-Garage-Controls-Smartphone/dp/B00EAD65UW), and other locations.

The MyQ app is a free download from the App Store (https://itunes.apple.com/us/app/chamberlain-myq-home-control/id636030203?mt=8) (iOS) and the Google Play Store (https://play.google.com/store/apps/details?id=com.chamberlain.myq.chamberlain&hl=en) (Android).

Do you have plans to automate your home with IoT devices like the MyQ Garage and MyQ app? Share your thought in the discussion thread below.



About Jordan Golson

Jordan Golson is an Apple Columnist for TechRepublic. He also writes about technology and automobiles for WIRED and MacRumors. He has worked for Apple Retail twice and has been writing about technology since 2007.

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MyQ Garage: The Perfect Addition To A Home

By Betty Bite | Jun 18, 2015 | No Comments

In an age when everyone is always on the go, people tend to like to find items that they can add to their lives to make life that much

simpler. Having a smart home is often not in everyone's budget but there are products out there that can actually advance your home

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instead of purchasing a costly system. MyQ Garage is one of those products. MyQ Garage is made by a company called Chamberlain, many of you might already be familiar with their line of products and advancements in home products. As a manufacturer of some of the world's most reliable, efficient, and cost-effective home control products, Chamberlain is determined to build its established reputation as the industry leader.

So you might be wondering what exacly the MQ Garage do and what can if offer you? The new MyQ Garage connected device and smartphone app lets you open or close the garage door from anywhere, shows you if the garage is open or closed, and provides you absolute peace of mind, knowing that your home is safe and secure. Included in the box you receive everything you need to install this unit, the Wi-Fi hub and the door sensor along with hardware to attach the hub. Setting up this system literally takes about 25 minutes from start to finish. After you have located the best spot for you to place the hub (make sure you have a good wi-fi signal) turn on your Bluetooth and connect the MQ. Once this is connect, the App store will open, just proceed to download the app. After that is done simply mount the hub and the sensor in the best locations.

MyQ Garage™ Universal Smartphone Garage D...

Appx1605

Key features of MyQ Garage:

- Garage door remotes that are left in the car are a target for thieves; MyQ lives on your cell phone, so there's no need to have a clicker in your car
- MyQ sends push notifications when your garage is in use (and when it's been left open) so whether you're on vacation or out running an errand you can make sure the garage is always closed
- Installs in minutes – less than five simple steps before it's ready to use — great for a DIY consumer
- Plug and play with your existing garage door opener and WiFi router — syncs seamlessly with your existing technology

In all, I really love this device. Since I don't have a garage door myself, I gave this to a neighbor and set it up for her. She absolutely loves it and has had no problems with the system over the past two week. To use this system, you must have a garage door opener that use safety reversing sensors located at the bottom of the garage door track. You can find out more about compatibility with your existing garage door here. The purchase price for this unit is $129.99 and can be purchased on the Chamberlain site. This would make a great Father's Day gift or even a little something for you own home. With everyone always being on the go, it is so important to find ways to keep an eye on your home.

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The MyQ Garage App: OMG Did I leave the garage door open?

June 18, 2015
6:56 AM MST

The MyQ Garage App: OMG Did I leave the garage door open?
Chamberlain

The MyQ Garage App

Rating: ★★★★★

You planned your family vacation for months. You got your vacation clothes pressed and packed, loaded pertinent addresses into the GPS, and chased everyone out the door. Two hours in and you're feeling pretty smug, when suddenly it hits you - **"Did I leave the garage door open?"**

Your partner, the control freak, will only stop for bathroom breaks on a pre-planned schedule, so there is zero chance of turning around. You desperately dial everyone in your contact list, but it seems like the whole world is on vacation. Finally, you reach the neighbor's kid and leave a message, but you're pretty sure you hear the sound of zombies in the background so you know that won't work. As your hometown grows dimmer in your rearview mirror, all you can picture is someone backing up the U-Haul and getting away with everything in your garage and house.

Fortunately, there exists a very practical solution to this all-too-common problem. Chamberlain, the leading maker of garage door openers, has innovated a MyQ Garage app and device. It quickly and easily lets you check to see if the garage door is indeed closed, from anywhere in the world via WiFi and your smartphone or tablet. You can also open and close the door remotely if you need to let a friend in, or have a delivery safely stored. The app will even alert you if the door opens for any reason.

You need to be able to receive WiFi signals in your garage. Full installation usually takes somewhere around 30 minutes. Some newer openers already come with this feature included. You can also add MyQ, or upgrade an existing opener, as it works with most brand garage door openers manufactured after 1993. Just make sure your garage door opener has safety reversing sensors which can be found at the bottom of the door track before buying the app.

MyQ is a great app that will deliver peace of mind when taking your family road trip this summer. Now about that toothbrush and the doggie treats...

Joshua Estrin
Pop Culture Examiner

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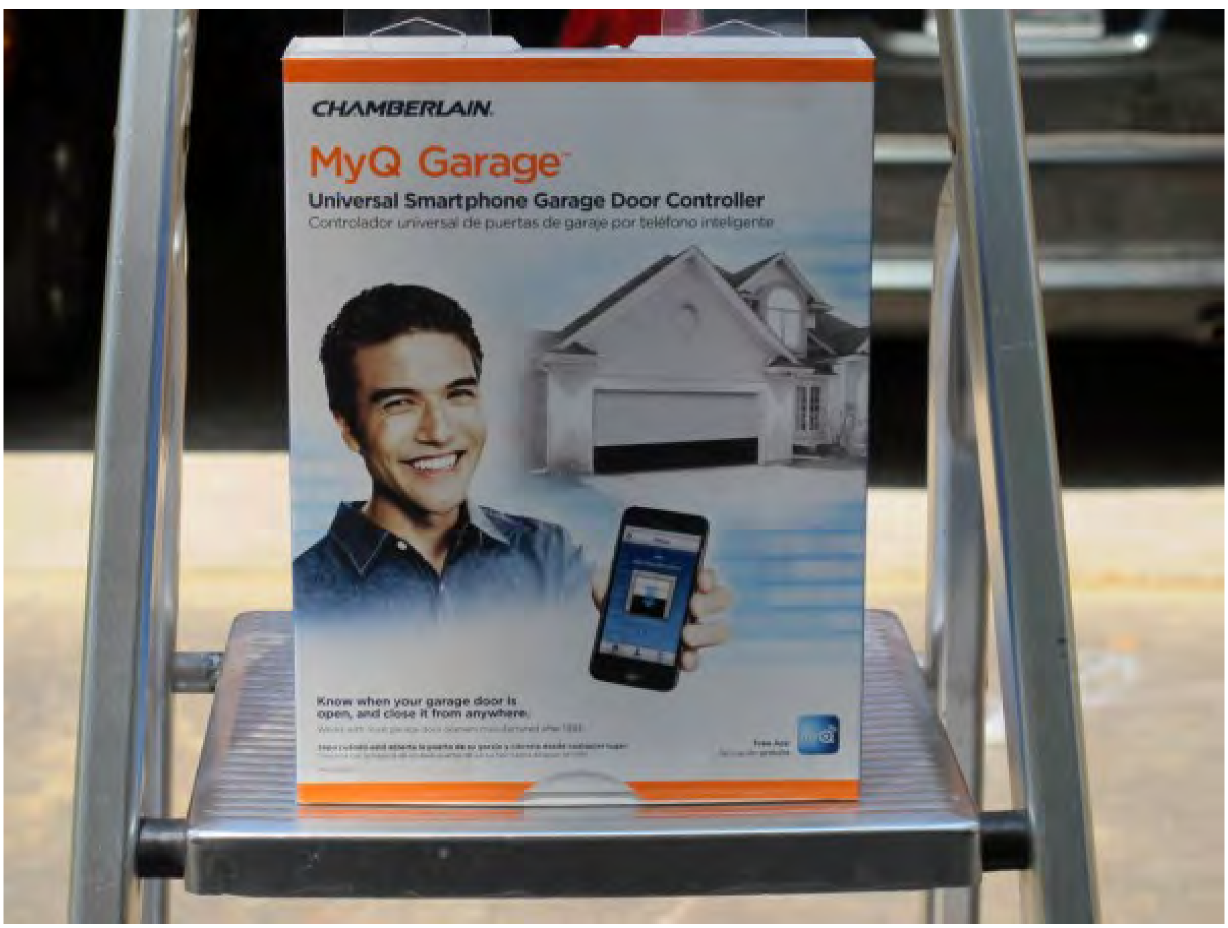
Chamberlain MyQ Garage Universal Smartphone Garage Door Controller review

by BILL KUCH on JUNE 6, 2015

{ 16 comments }



Have you ever driven down the road and wondered if you closed the garage door when you left? Unfortunately, it happens to me a lot, and then I'm in the situation where I can worry about it until I get home or drive back to check. Sometimes I'm 150 miles away when I think about it and then driving back is not an option, which means I worry about it all weekend. The MyQ Garage Universal Smartphone Garage Door Controller aims to solve my problem, by letting me check the status of the door and then opening or closing it as appropriate.I do have another device that tells me if the garage door is closed, but there is no way for me to close it remotely. Now I'll be able to overcome my forgetfulness anywhere I have Internet access and my smartphone.

Features:

- Installation in about 30 minutes
- Works with iOS and Android devices
- Works with most garage door openers manufactured since 1993
- Control your garage door with your smartphone

The device consists of two main pieces: the hub on the left and the remote sensor on the right. There is a power supply for the hub in the kit and various screws and brackets to mount the items in your garage.

The first step in the installation is to configure the hub with your WiFi at home. You must have a good signal in your garage for the MyQ to work well. I checked mine out using my smartphone and because the garage is directly below the room with my router, I had a very strong signal. There are two suggested ways to configure the hub. One is using the app, which you download, or you can use the WPS function of your router if it's supported. I went the WPS route and after powering up the MyQ hub and then pushing the WPS buttons on both the router and hub, it was configured in a flash.

Now it was time to go down to the garage to actually mount the hardware. This was very simple. If you can use a screwdriver, you should have no problem. All the brackets and screws are provided.

The hub (the black box on the right) slides into a bracket that is attached to the ceiling. The bracket is attached sing two screws and sheet rock anchors. Then plug in the provided power supply and connect it to the hub.

Here’s a closer look at the hub. In the center is an LED which flashes when the command is given to close the door. It also sounds a beep while closing. The only cable required is for power.

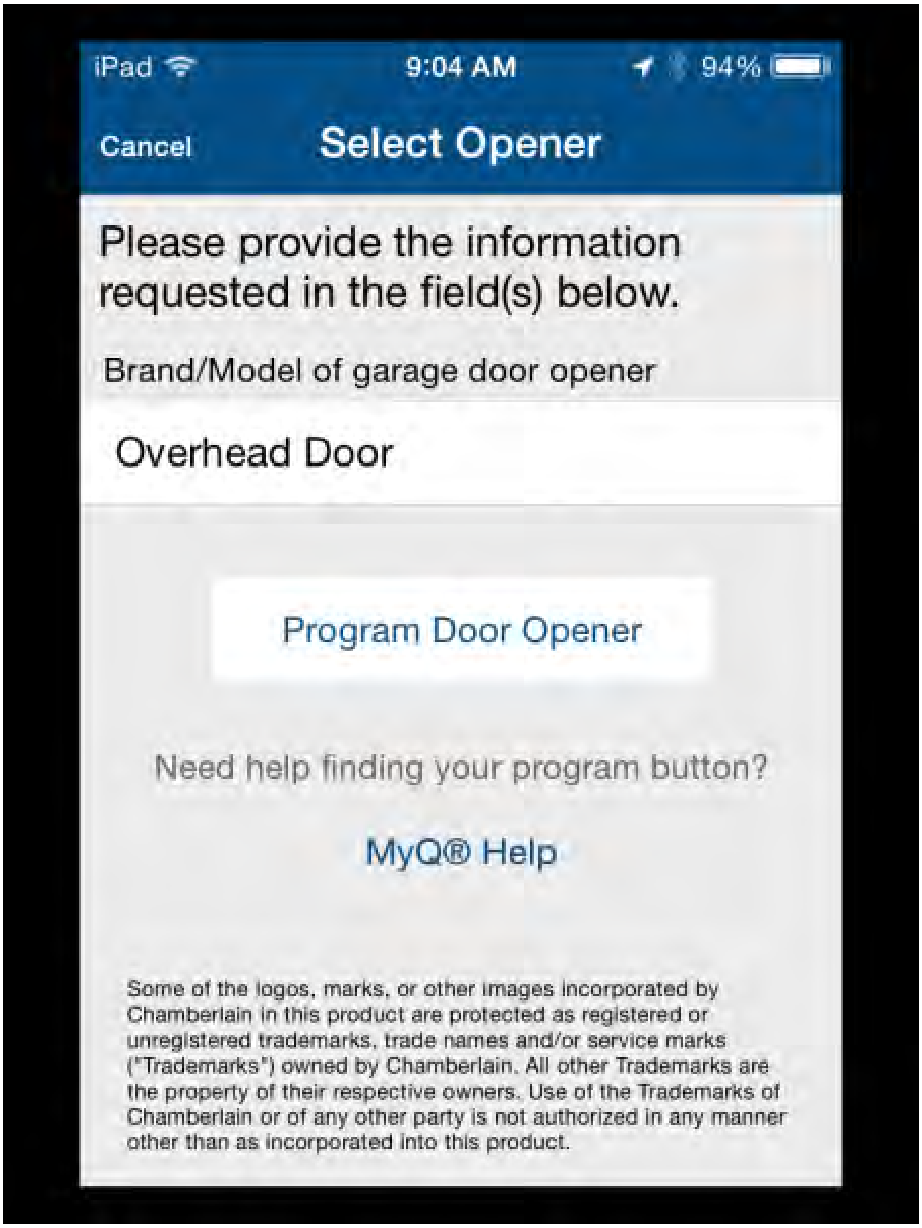
And here's a look from a different angle.   By the way, before you purchase the MyQ, go to their website and check that your opener is on their supported list.

Next you'll need to attach the remote sensor to your garage door. The included instructions make it very clear as to the orientation of the sensor and where it should be mounted.

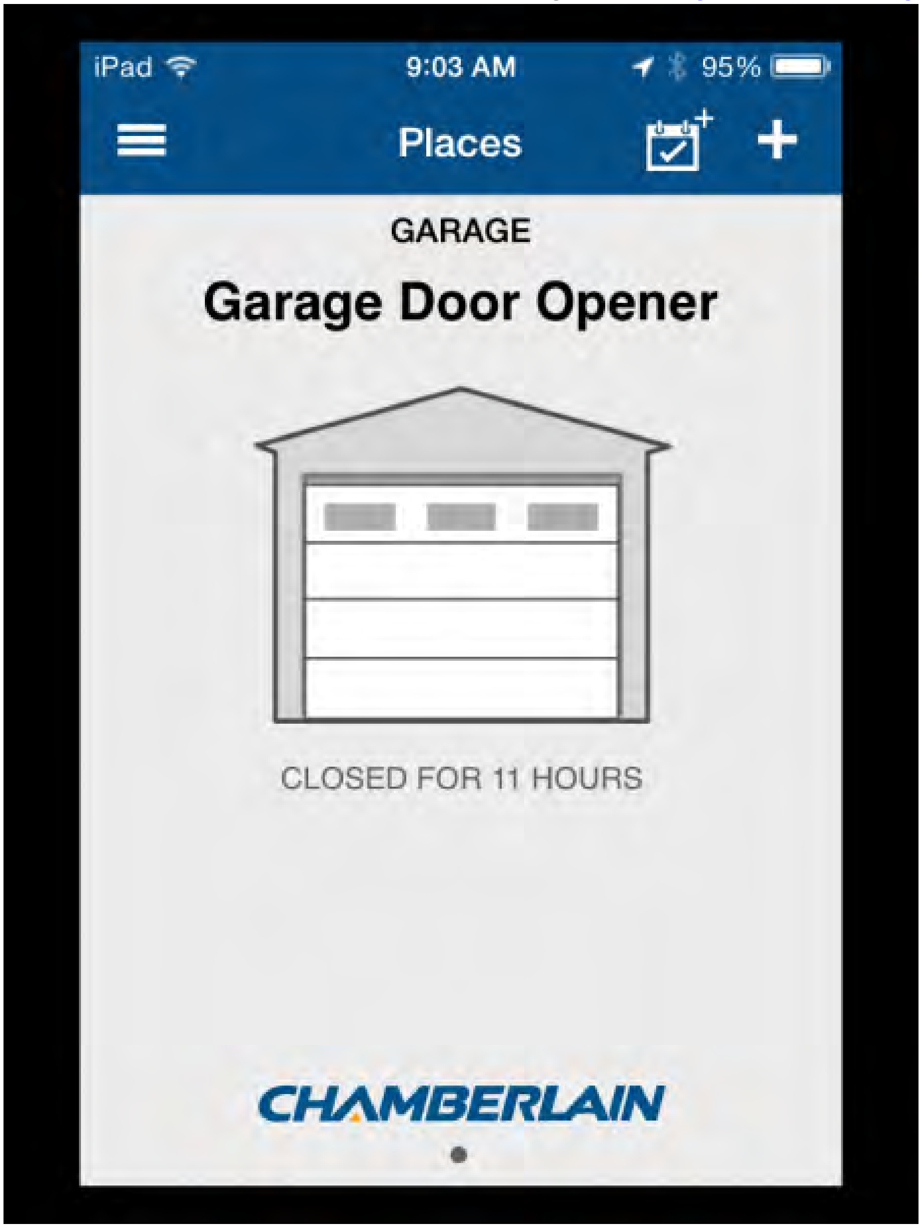
One thing that was not pointed out in any of the documentation is what type of battery the sensor requires and how long it will last. FYI, it is a CR2450.

Once the hardware is installed, it is simply a matter of downloading the free smartphone app and following the instructions for setting up a new device.

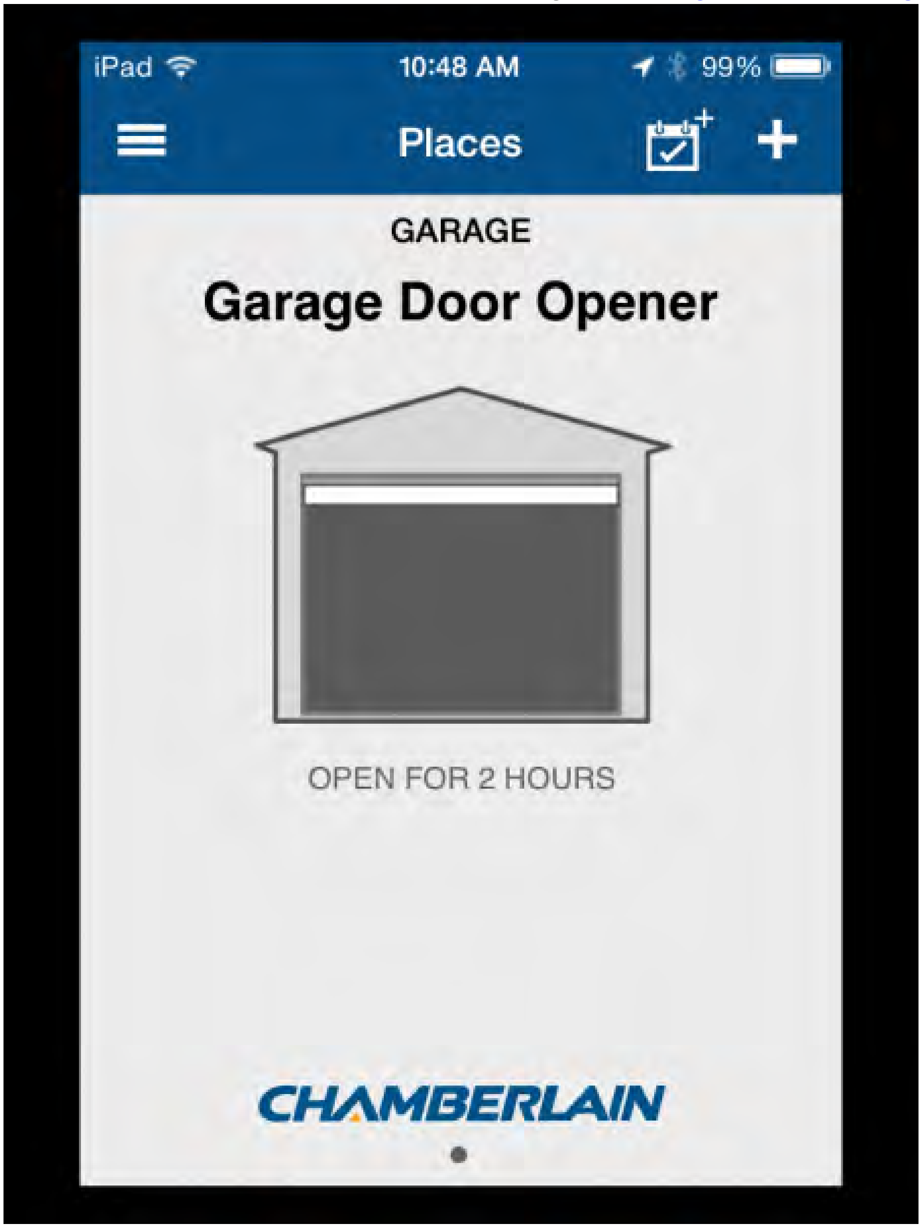
Firstly, ensure you have a WiFi signal at the hub. This is shown by the indicator light on the hub. A solid green light means you're good to go. Next, you fire up the app and go step by step.



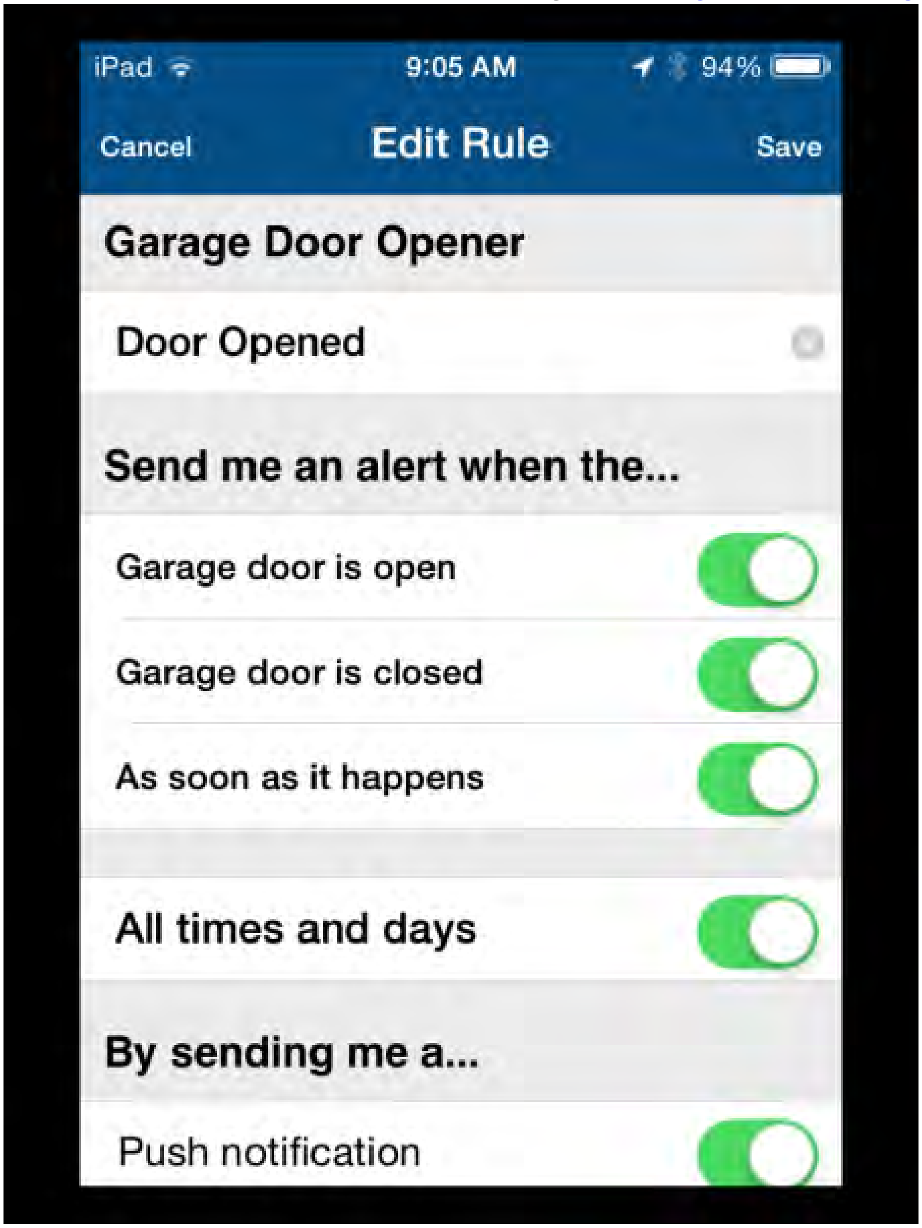
At some point, you have to sync the remote with the hub by pressing the test button on the remote sensor. Then it's time to program your door opener. Now would be a good time to dig out the opener manual if you don't know where the program button is or how it works. I didn't have a manual, so I looked around the opener and finally discovered a learn button under the lamp cover. I pushed the button and continued with the app and in a matter of seconds the garage door began to close. This couldn't have been easier.



When using the app, you are presented the home screen which depicts the position of your garage door. By tapping on the icon of the door, it will either open or close the actual door and the graphic will change to show the current state.



And now it's opened.



It is also possible to set alerts via the app, to inform you of transitions of the garage door.

During my time of using the MyQ, I didn't experience any issues with the door not responding to commands from the app. However, on one occasion, the app hung on my Android smartphone, and I had to force stop and restart it. From that point it worked with no further problems.

The MyQ is an addition to your normal way of opening and closing the garage door. You can still use your remotes and hardwired buttons and the MyQ will send alerts and indicate the position of the door in the app. With the addition of another remote sensor, the MyQ can control up to 2 doors.

The MyQ has made my life a little easier in that I don't worry anymore about whether I remembered to close the garage when leaving the house because it allows me to close it when I forget. And because we use the garage as the main entry to our house, I can give the password for the app to my relatives for access when I'm not home. It also lets me know when they come in.

Updates 03/08/16

This item has been in constant use since the review and has saved me going nuts remembering whether I closed the garage door or not. When I didn't, a simple tap on the app icon and I went my merry way.

Source: The sample for this review was provided by Chamberlain. For more information, visit http://www.chamberlain.com or Amazon to order.

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Product Information

Price:	$129.99 MSRP
Manufacturer:	Chamberlain
Retailer:	Amazon.com
Requirements:	Broadband Internet Home WiFi Compatible garage door
Pros:	Easy Setup and installation Boon to forgetful people
Cons:	None

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DAD OF DIVAS

ONE DAD'S QUEST TO REGAIN CONTROL OF HIS KINGDOM

Taking Control of your Garage With Chamberlain MyQ

JUNE 4, 2015 BY DADOFDIVAS — LEAVE A COMMENT

All opinions expressed in this review are my own and not influenced in any way by the company. Any product claim, statistic, quote or other representation about a product or service should be verified with the manufacturer or provider. Please refer to this site's Disclaimer for more information. I have been compensated or given a product free of charge, but that does not impact my views or opinions.

Picture it, you are away on vacation, you have a neighbor watching your home, and they lose your key. How the heck are you supposed to help? What if you have pets that must be fed? Do you pay them to have a locksmith come out? Talk about expensive! Now there is a better way!

Recently I learned about the **Chamberlain MyQ Garage** device. This is a new device that you install in your garage and connect to your garage door. By connecting these, you are able to control your garage door remotely through an App that you can download on your phone.

The MyQ device was easy to set up and though it does take a bit of time to set this up in your garage, when you do get it set up, it takes only a few minutes to get things set up once complete.

One of the hardest things to do for me is finding a stud in the ceiling of your garage that will allow you to hook the receiver to the ceiling of your garage. I did find one and once I did, I was able to easily connect the receiver to the ceiling. The second piece that you must connect is the MyQ receiver that you connect to the door itself. You have two ways to do this. You can either connect this with adhesive strips, or you can screw this onto the door itself.

I have tried to control the garage with my new MyQ device when both near and far and so far I have had no problem using it whether 10 or 50 miles away, so it is working perfectly!

Thus, in the end, if you are interested in taking control of your garage door and make your house more accessible when you need it to be, look no further than using this new Chamberlain MyQ device!

Features of the Chamberlain MyQ Device

Creating the Smartest Garage on the Block

- The new Chamberlain Wi-Fi MyQ Garage Door Opener with Smartphone Control lets you monitor, open and close your garage door from anywhere in the world with a smartphone.
- Alerts to your smartphone when the door opens or closes tell you when your kids make it home safely from school or when anyone is coming and going from home.
- The new product turns your smartphone into a house key so you can go for a jog without taking your key, or let your neighbors or kids inside when you're miles away.
- The MyQ opener will work with Apple HomeKit, SmartThings by Samsung, Google's Nest and the Wink App, so you can connect your garage door to other home devices.

- The product will be available in two models this May at Home Depot, with expected retail prices of $250 to $270.
- Chamberlain also offers MyQ Garage, a simple, $129 add-on to existing garage door openers, offering the same benefits if a new opener isn't needed.

Giveaway

How would you like to win this for yourself or for your family? All you need to do is fill out the below form to be entered. The contest will run for one week and will end on June 11, 2015.

Winner must be a resident of the U.S.

Charles Hudson

Open and Close Your Garage Door from Your Smartphone with Chamberlain MyQ

Our 1920's bungalow has a stand-alone garage that is on the small side but still fits one vehicle. We've got a standard white garage door with a Genie opener, nothing fancy but it does the job. The opener is a bit quirky and we've been coveting all of the new tech that has arrived around the garage door. Specifically Wi-Fi openers.

We open our garage door multiple times on a daily basis and we sometimes hit the panic button if we can't remember who closed it, or if it even was closed. We've even had a neighbors come over and tell us it was left open (I know slap on the wrist).

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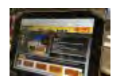
International Builders Show – IBS 2014 Photo Gallery

The **Chamberlain MyQ Garage Smartphone Garage Door Controller** has set our minds at ease. The MyQ Garage allows you to control and monitor your garage door from anywhere, at any time. Regardless of manufacturer, the MyQ Garage works with the majority of garage door openers manufactured after 1993. I'm not sure when our opener was built but it's at least 10 years old and works flawlessly with the system.


CHAMBERLAIN
MyQ Garage
ADDITIONAL CONTENTS BELOW
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Install took about 15-20 minutes. We hooked up the hub near the garage door opener, secured the MyQ device to the garage door, and then downloaded the app. It's really that easy.

I've used the app on a daily basis and it's worked every time. There is a nice alarm feature when you close the door using the app so people know to get out of the way and they strongly recommend to only use on doors that have a safety reversing sensor that is located at the bottom of the door track. This prevents the door from closing if something is in the way.

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Appx1629

Written by Timothy Dahl

Timothy's background includes stints at This Old House, ELLE DECOR, Metropolitan Home and Woman's Day. His work has been published on Wired Design, Bob Vila, DIY Network, The Family Handyman and Popular Mechanics and he has been featured on the Martha Stewart radio show and as a speaker at the ALT Design Summit, K/BIS and the National Hardware Show.

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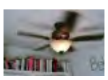
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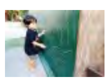
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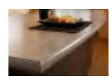
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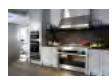
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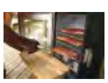
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First Look: Chamberlain MyQ Garage

Automation, First Look, Security February 24, 2015 0 Eric Murrell

For the forgetful.

Generally speaking, I'm a creature of habit. I try to keep the same morning routine. I like to leave work at the same time every day. I leave my keys on the same plate every time I get home. For better or worse, I tend to keep the same patterns over time.

Unfortunately, that means I always forget to close our garage door. I don't know what part of my (normally reliable) brain shuts down, but I just can't seem to hit that little button when I leave the driveway in the morning. I can't tell you how many texts I've received from neighborhood friends to let me know our garage door is still up.

For that reason, the Chamberlain MyQ Garage system will soon make its way into our garage. About the size of a small book, the MyQ hub mounts to the ceiling above your garage door opener with a companion sensor that attaches to the door itself. Once you're up and running, the system allows you to open and close your garage door with your smart phone, keep an eye on its current status, and even receive notifications for any door activity. Better still, it integrates with the Wink smart home system (which we're increasingly relying on for our new home).

MyQ Garage Overview

The MyQ sounds like it can offer a lot of peace-of-mind to forgetful brains like mine. It's available now for $129; check back soon for a full review!

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AUTHOR

Eric Murrell

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Eric is the creator of *At Home in the Future* and has been a passionate fan of the future since he was seven. He's a web developer by trade, and serves as the Director of Communication and Technology for a large church in Nashville, TN (where he and his family are building a high tech home in the woods).

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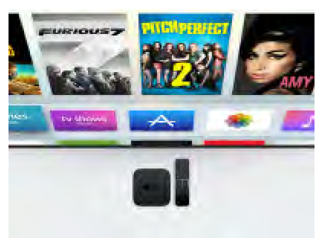

FIRST LOOK: 4th Gen Apple TV with Siri

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MommyTech TV: Did you forget to close your garage door @ 2015 International CES

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APPS

0

MommyTech TV: MyQ App Takes the Garage Opener to The Next Level

By Ali Heriyanto • On January 27, 2015

If someone told me five years ago that I could be notified via my smartphone whenever I forgot to close the garage door, I would tell them they are insane. Well, the time has come for smart home technologies to start making their way to other parts of the home—to that effect, MyQ Home Control is an iOS/Android app that works as a smart garage door opener.

While we have seen similar apps that control the lights around the home, we haven't come across too many garage door opener apps. The beauty of MyQ is the peace of mind it gives you when you are away from home. MommyTech TV's Andrea Smith sat down with Sital Belmont of Chamberlain to talk about MyQ Home Control and what it means for families. The app isn't just useful when you forget to close the garage door—you can receive notifications when the door is opened or closed, so when your kids come home from school and use the app to get inside, parents will know immediately without having to call home – or having their kids call them. Pretty smart!

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Why the Hound's Return Gives New Life to That 'Thrones' Theory

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WHY YOU SHOULD CARE

When it comes to smarting up our devices, why should garages get left out in the cold?

If you have a garage, you've likely experienced a nagging bout of door doubt at some point. It's that sinking feeling you get after leaving home, and it starts when you're about two blocks away: "Did I actually close the garage?" But you're probably running late and the kids are arguing in the backseat, so it's no wonder you can't recall. Until a year ago, you had two choices: Double back and check, wasting precious minutes, or just take the chance that thieves won't view a wide-open garage as an invitation to help themselves to its contents. Today, however, there's a third, smarter way to go.

In 2010, the Chamberlain Group (http://www.chamberlain.com/), which has been making garage door openers since 1954, set its sights on the smart home and the broader Internet of Things. Not long ago it launched a new line of connected garage openers (http://www.chamberlain.com/smartphone-control-products/smartphone-garage-door-openers) dubbed MyQ. Cory Sorice, vice president of marketing at Chamberlain, says the product is designed for those looking for peace of mind.

If it turns out you did leave the door open, a simple tap on the app will close the door — no matter where you are.

If you connect the MyQ opener to your Wi-Fi network via the optional MyQ Internet Gateway ($50), you can use the free iOS or Android app to check the status of your garage door in real time. If it turns out you actually did leave the door open, a simple tap on the app will close the door, whether you're two blocks away or halfway around the world. You can also set up push notifications and email alerts, such as "If my garage door is open for longer than 30 minutes, let me know."

If your current door opener works just fine and you don't want to replace the whole thing just for a little more convenience, Chamberlain's MyQ Garage (http://www.chamberlain.com/smartphone-control-products/myq-garage/model-myq-g0201) is a $129 add-on, which Sorice says will "work with nearly every brand of garage door opener made after 1993." There are alternatives (Ascend (http://www.quirky.com/shop/616#.), Iris (http://www.wired.com/2014/08/iris-z-wave-garage-door-controller/), Garageio (https://garageio.com/)), but so far, there are no garage door openers that have the built-in connectivity of the MyQ models. Available at major DIY retailers, Chamberlain MyQ-compatible openers start at $160 (MyQ Gateway not included), while kits that include the Gateway start at $248.

But the big question: Given that your garage door (and thus possibly your home) can be opened via the Internet, are there any safety caveats? Casey Ellis, CEO of Bugcrowd (https://bugcrowd.com/), a company that helps businesses find security flaws in their products through coordinated bug-bounty programs, cautions that "devices which perform a critical function [locking a door, activating a smoke alarm, controlling a power outlet] are more likely to be targeted by attackers." So, to be safe, consumers should always install software or firmware updates when the manufacturer recommends them.

A connected garage opener can't do anything about your uncooperative kids, but at least you can drive off in the mornings knowing that door doubt can be a thing of the past.

MyQ Garage review:

Chamberlain's MyQ Garage is a smart-home gateway drug

By: Rich Brown / Reviewed: August 25, 2014

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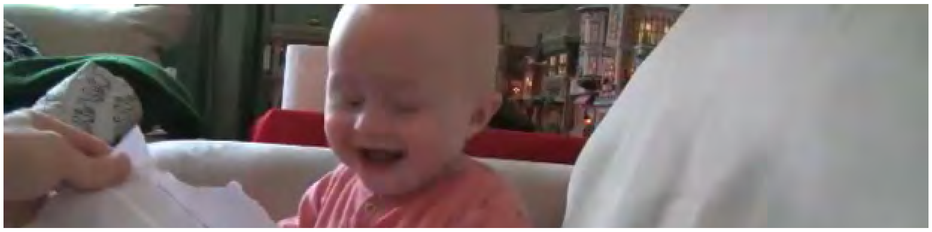

$99.00

MSRP: $130.00

MyQ Garage (Part #: MYQ-G0201)

Amazon.com	$99.00	SEE IT
eBay	$111.46	SEE IT
Build.com	$135.99	SEE IT
Apple	$129.95	SEE IT
Verizon Wireless	$129.99	SEE IT

See all prices »

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CNET EDITORS' RATING

BE THE FIRST TO REVIEW!

THE GOOD / The Chamberlain MyQ Garage is one of the most affordable smart garage-door openers, and also one of the easiest to install.

THE BAD / It works with a growing list of other smart home products, but notables like SmartThings and Revolv still don't have official support.

THE BOTTOM LINE / Chamberlain's MyQ Garage should be the first on your list if you want to add some smarts to your garage door. Just prepare your wallet for the urge to link it to other devices.

S	7.0
Y	9.0
	8.0
ANCE	9.0

Review

Prices

User Reviews

336

The $130 Chamberlain MyQ Garage Door Opener lets you open and close your garage door from anywhere with an Internet connection. It also grants you the ability to set custom alerts and monitor the open/closed status of your garage door.

There's a lot to like about the MyQ. Installation is simple. Broad compatibility means the MyQ should work on your current garage hardware. Chamberlain's inclusive attitude also means you can coordinate the MyQ to interact with a growing number of connected home platforms.

You'll find that interoperability to be crucial to the MyQ achieving its full potential. The basics of the MyQ all work as expected, but soon after you install it you start wondering what else it can do. What if it could learn when you're coming and going and respond automatically? Wouldn't a camera in the garage also make sense?

View Full Gallery

Colin West McDonald/CNET

Between its comparatively low cost and its ease of use, the MyQ is recommendable in that it that delivers on its core promises with little fuss. Just be prepared to feel the itch to add more smart products once you start using it.

Installs in a flash

The world of connected garage door openers is surprisingly broad. In addition to Chamberlain's own fixed units with built-in connectivity, it shares the same MyQ technology with sister brand Liftmaster. Sears' Craftsman also has it own line of connected openers using a tech it calls AssureLink. You'll also find at least half-a-dozen options on the retrofit market.

Those retrofit devices include GoGoGate, Garageio and others, with prices ranging from $130 for the MyQ to $180 or so. Although it's one of the least expensive devices in its class, the MyQ is also one of the easier units to install, requiring no wired connection to your existing opener.

The entire MyQ kit itself is made up of of two main hardware components; a base station that attaches to the ceiling of your garage near your current opener, and a sensor unit that adheres to the garage door.

Installation should take about 15 minutes. Start by screwing a small bracket to your garage ceiling near a power outlet (wood screws as well as drywall screws and anchors are included). Slide the base station onto the bracket, plug in the power cable, then link your phone, your wireless network, and the garage opener to the base station, via Bluetooth and Wi-Fi.

View Full Gallery

Colin West McDonald/CNET

Go through the typical iOS or **Android** Bluetooth pairing process to link the devices and share your home Wi-Fi settings between your phone and the MyQ base station. That step puts the hub on the Internet, granting you access to your garage door opener from anywhere you can get online with your phone. Via the MyQ app, you then make an account and add the device via the serial number from the base unit.

Select the make and model for your opener within the app, and then follow the prompt to hit your opener's program button. Chamberlain says the MyQ is compatible with any photoelectric sensor-equipped opener made after 1993. The opener will then broadcast the open/close code for the hub to memorize. Lastly, attach the door sensor to your garage door via the included adhesive strips and hit the test button to pair the sensor to the MyQ hub.

None of these steps are terribly onerous. Yes, you'll need to get up on a ladder and drill into the ceiling of your garage (unless you mount the hub some other way). There's no need to mess with breaker switches or hard wiring the hub to anything, making it an exception in its category. It also matched the photoelectric signal to my Overhead Doors Overdrive opener on the first try.

View Full Gallery

The MyQ app gives you a fair amount of control and insight into your garage door activity.

Screenshot by Rich Brown/CNET

Chamberlain also deserves credit for making the Wi-Fi receiver in the hub rather strong. My iPhone registers only one bar of Wi-Fi signal strength coming from my house to my detached garage, and sometimes it doesn't find the signal at all, but I've always been able to find the MyQ remotely and send signals to it in the two weeks or so that I've had it installed.

CONTINUE TO NEXT PAGE 01 / 02

MyQ Garage – Control Your Garage Door Via Your Smart Phone

By **digital mom blog** - December 13, 2013

We have a slight problem in our house… the garage door just doesn't like to be kept close. It annoys me to no end, but with 4 kids trailing in and out – it tends to be left open often.

Besides the obvious security issue, there is something else…. We have had the cops TWICE ring our door bell in the middle of the night (2 am-ish) alerting us that our garage door is open. Nothing like being JOLTED awake at 2 in the morning wondering who is at the door bell and then seeing it's the police. Talk about heart-pounding. I know they are doing their job, and I am grateful for great neighborhood surveillance.

Well that was then, and this is now. Chamberlain sent us over their MyQ Garage which is a smart phone controller for your garage door! And bonus: you don't have to have a Chamberlain door for it to work with your garage door opener. We can now see at anytime if our garage door is open or close and open and close the garage door with our smart phones. Pretty neat, right?

Case: 1:16-cv-06297 Document #: 1-5 Filed: 06/10/16 Page 51 of 51 PageID #:468

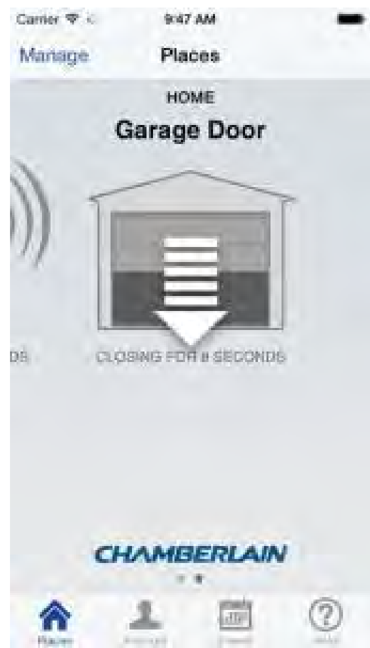
MyQ Garage

Feel secure knowing you can control your garage door from anywhere in the world via WI-FI and your smartphone.

PRODUCT FEATURES

- Installs in minutes and works with your home's Wi-Fi
- Free app with no monthly or ongoing service fees
- Included: Wi-Fi Hub, door sensor, mounting bracket, power cord and instructions for free app download.

MyQ Garage App



The MyQ Garage is controlled through you MyQ Garage app, think of it as a garage door controller on your phone. The app is a free download. Setup is totally simple – just create an account, verify your email, login and enter your device's serial number. Then you are ready to rock and roll.

Download the App

- Download app for iPhone
- Download app for Google

If you are in search of a Christmas gift, the MyQ is a great option, especially for the tech lover in your life.

Learn more about MyQ Garage

EXHIBIT D
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PRODUCT OVERVIEW

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Get more out of your garage with Ryobi. Introducing the next generation of garage door openers with the Ryobi Ultra-Quiet Garage Door Opener. The ultra-powerful motor will quietly open and close large doors with ease due to the 2HPs for faster openings. With motion controlled overhead LED light with a selectable duration control so you are never left in the dark. Rest assured even in power outages, this unit is lithium-ion battery backup ready with over 100 openings using a Ryobi One+ P108 4Ah Battery (sold separately). For added control, the Ryobi opener is compatible with HomeLink and is Wi-Fi connectable. It comes with a multifunctional wall control, wireless keypad, two remotes, safety sensor and a downloadable app to control and monitor you garage door remotely. Also turn your garage to the best room in the house with the Ryobi Garage Door Opener System. Add any of the great plug and play accessories to power, cool, alert, park assist and rock out.
California residents: see Proposition 65 information

- 2HPs most powerful motor for faster openings
- Steel reinforced belt driver for longer life
- Ultra-quiet drive system - 20% quieter than the leading garage door openers
- Lithium-Ion battery backup ready with over 100 openings using a Ryobi one+ P108 4AH battery (sold separately)
- Easy to assemble 3-piece rail - less parts, less hassle
- Intelliport technology charges your Ryobi one+ batteries, protects the cells, maintains battery life and conserves energy
- Control your door remotely with the Ryobi garage door opener app; download for free in the iOS app store and Google play
- Lifetime LED light to illuminate the darkest garages
- Wi-Fi and HomeLink compatible
- Ryobi lifetime warranty on the motor and belt
- Unit is compatible with 7 ft. Garage Doors, can be expanded to 8 ft. with purchase of extension kit (GDAEXT100)
- Includes garage door opener unit, 2 car remotes, wireless keypad, interior wall control, safety sensors, 3-piece rail, garage door opener, mounti hardware, safety label assembly instructions and operator's manual

Feedback

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF ILLINOIS

THE CHAMBERLAIN GROUP INC., Plaintiff, v. TECHTRONIC INDUSTRIES CO. LTD., TECHTRONIC INDUSTRIES NORTH AMERICA, INC., ONE WORLD TECHNOLOGIES INC., OWT INDUSTRIES, INC., ET TECHNOLOGY (WUXI) CO. LTD., and RYOBI TECHNOLOGIES, INC., Defendants,	Civil Action No. 1:16-cv-06097 The Honorable Thomas M. Durkin Magistrate Judge Sidney Schenkier **FILED UNDER SEAL**

DECLARATION OF V. THOMAS RHYNE IN SUPPORT OF PLAINTIFF'S MEMORANDUM IN SUPPORT OF ITS MOTION FOR PRELIMINARY INJUNCTION

I, V. Thomas Rhyne, Ph.D., P.E., R.P.A, declare as follows:

INTRODUCTION

1. I make this Declaration at the request of The Chamberlain Group, Inc. ("CGI" hereinafter) in support of CGI's motion for preliminary injunction.

2. My educational background, qualifications, and professional experience are summarized in ¶¶ 7 to 20 below, and are described more fully in my *curriculum vitae* which is attached hereto as **Exhibit A**.

3. In this Declaration I provide my opinions concerning infringement of certain claims of U.S. Patent Nos. 7,635,966 (**Exhibit C**, "the '966 patent" hereafter) and 7,224,275 (**Exhibit D**,

"the '275 patent" hereafter) by Techtronic Industries Co. Ltd., Techtronic Industries North America, Inc., One World Technologies Inc., OWT Industries, Inc., Et Technology (WUXI) Co. Ltd., and Ryobi Technologies, Inc. (collectively "Ryobi" hereinafter).

4. I am being compensated for my work in this litigation at my standard consulting rate of $695 an hour. My compensation does not depend in any way on the opinions that I express in this Declaration, or on the outcome of this litigation.

5. I submit this Declaration having reviewed the '966 patent, the '275 patent, the file histories of those two patents, and the other materials referred to herein. I have also visited one of the Home Depot stores in Austin to observe the accused Ryobi GD200 model Ultra-Quiet Garage Door Opener (the "Ryobi GDO" hereafter) that is being sold there. I purchased, studied and tested the Ryobi GDO and have studied information about that available on the *www.ryobitools.com/gdo/* website. A list of the materials I have considered is attached hereto as **Exhibit B.**

6. All of the opinions stated in this Declaration are based on my own personal knowledge and professional judgment; if called as a witness in this matter, I am prepared to testify competently about them.

QUALIFICATIONS

7. As I noted above, a full listing of my qualifications as a technical expert for this litigation are detailed in my curriculum vitae, which is attached hereto as **Exhibit A**.

8. I have studied, taught, and practiced electrical engineering for more than fifty years. I hold degrees from Mississippi State University (Bachelors of Science in Electrical Engineering with Honors, 1962), the University of Virginia (Masters of Electrical Engineering in 1964), and the Georgia Institute of Technology (Ph.D. in Electrical Engineering, 1967). I have been a Registered Professional Engineer in the State of Texas since 1969. I have also been a Registered Patent Agent with the U.S. Patent and Trademark Office (the "USPTO") since 1999.

9. I taught electrical engineering, computer engineering, computer architecture, and computer science at the undergraduate and graduate levels full-time at Texas A&M University from 1967 to 1983 and part-time at the graduate level at the University of Texas from 1983 to 1991. My twenty-plus years of industrial experience include work at the Electric Power Research Institute, Texas Instruments, Control Data Corporation, NASA, Texas Digital Systems, Inc. (a company I co-

founded to produce microprocessor-based computer peripherals in 1976), the Microelectronics and Computer Technology Corporation (MCC), and Motorola, Inc.

10. I have extensive experience with computer technology, including design and teaching experience with a variety of computer systems, microcomputer systems, and microcontrollers. I have participated in the design of several computer systems and microprocessors, and have designed systems which made use of those devices as controllers. I am familiar with a variety of computer architectures and am an experienced programmer in a variety of programming languages as well as assembly-level language on a number of different computers and microprocessors. I have been an Internet user since the early 1990's.

11. Based on my academic and consulting experience I am familiar with a variety of computer interfaces, website operations, and data-communications protocols. I have managed large and complex software-development programs and have been and am familiar with the Internet and its use for providing services to users. Prior to joining MCC I was responsible for bringing access to the ARPANET to Texas A&M University, an activity which gave me insight and experience with the exchange of information over wide-area networks. I later assisted MCC's information technology department in linking MCC's local-area network first into the ARPANET and later into the Internet.

12. While at MCC I managed MCC's research and development programs dealing with graphical user interfaces, natural-language interfaces, and early website development tools. In the early 1990's MCC researchers developed one of the first web browsers with search engine capabilities, and I was one of the early alpha testers for that effort. I also managed distributed database development for several years at MCC, as well as MCC's successful R&D program on Internet-based credit card fraud detection using neural networks.

13. I have extensive experience with garage door operators, including operators which can be observed and controlled over the Internet. I have installed and tested two systems that do that. My son, who studied computer science at MIT and who has worked with me as a software analyst in many of my prior patent cases, and I also built and tested a system that allowed his garage door operator to be observed and controlled over the Internet via a website he created for that purpose.

14. I have chaired and otherwise participated in a number of national and international IEEE and ISO/IEC standards committees.

15. During my academic career I authored thirty technical papers. I have also presented papers at thirty-seven conferences and authored an award-winning textbook, *Fundamentals of Digital System Design*, published by Prentice-Hall in 1973 and adopted at over thirty-five U.S. and international universities during its lifetime. My textbook has been cited as a reference by the U.S. Patent and Trademark Office. I have also served as a technical reviewer for Prentice-Hall, the *IEEE Transactions on Computers*, and *IEEE Spectrum*.

16. I was elected to serve on the IEEE Board of Directors for two terms representing the engineering education community and the IEEE Computer Society. I was also elected to two terms as the IEEE Treasurer and served one term on the Board of Governors of the IEEE Computer Society.

17. I have extensive experience with the accreditation of engineering and computer science programs in the U.S. and abroad, an activity which has provided me an excellent opportunity to become and remain familiar with the program curricula, faculties, and graduates from a large number of U.S. and international colleges and universities. I represented the IEEE for five years on the Engineering Accreditation Commission and for six years on the Board of Directors of the Accreditation Board for Engineering and Technology (ABET). In 2004 I completed a three-year pro bono assignment assisting Japanese universities and industries in the establishment of the Japanese Accreditation Board for Engineering Education (JABEE), and have led several other international accreditation missions.

18. I was appointed by the U.S. National Research Counsel to the Panel of Assessment for the Electronics and Electrical Engineering Laboratory of the U.S. National Institute of Standards and Technology. I served on that Panel for seven years, including three terms as its chair, and I provided invited testimony before the U.S. Congress regarding the status of the Laboratory.

19. My experience and qualifications have been recognized by the Texas Society of Professional Engineers (Young Engineer of the Year in Texas, 1973), the American Society for Engineering Education (Terman Awardee as the "Outstanding Young Electrical Engineering Educator in the U.S.," 1980), the Institute of Electrical and Electronics Engineers (IEEE Fellow, 1990, recognizing my contributions to "computer engineering and computer engineering education), the Accreditation Board for Engineering and Technology (ABET Fellow, 1992), and the IEEE Computer Society (Golden Core Awardee, 2000).

20. I retired from full-time work as of 1997 and draw retirement benefits from Texas A&M University. In addition to the full-time work described above and in my curriculum vitae, I have worked part-time as a consulting engineer for the past thirty years doing computer systems design, application-specific system design, and expert witness work in intellectual property litigation.

MY UNDERSTANDING OF THE RELEVANT LEGAL PRINCIPLES

21. This section of my Declaration provides my understanding of the currently applicable legal principles which I have used in forming the opinions set forth herein.

The Person of Ordinary Skill in the Art

22. When interpreting a patent, I understand that it is important to view the disclosure and claims of that patent from the level of ordinary skill in that art at the time of the invention. My opinion of the level of ordinary skill in the art is based on my personal experience working and teaching in the fields of electrical engineering and computer science, my knowledge of colleagues and others working in that general field as of and for several years prior to the 2003 to 2006 time frame, my study of the '966 and '275 patents and their file histories, and my knowledge of:

1. The level of education and experience of persons actively working in the field at the time the subject matter at issue was developed;
2. The types of problems encountered in the art at the time the subject matter was developed;
3. The prior art patents and publications;
4. The activities of others working in that field;
5. Prior art solutions to the problems addressed by the relevant art; and,
6. The sophistication of the technology at issue in this case.

23. In determining the level of ordinary skill in the art, I also considered, among other things, the following factors: (1) the sophistication of the relevant technology; (2) the rapidity with which innovations are made in that field; and (3) the educational level of active workers in that field. I have also been informed that these factors are not exhaustive and are merely a useful guide to determining the level of ordinary skill in the art.

24. Taking the above factors into account, in my opinion, a person of ordinary skill in the art of the CGI patents (a "POSITA") would be an individual having, as of the respective filing dates of each of those patents, an earned degree in Electrical Engineering, Computer Engineering, or Computer Science, and, for the '966 patent at least 1 year of experience working in the garage door opener space or with similar technology and, for the '275 patent, at least one year of experience working with security systems that can be visited and controlled via a large-area network such as the Internet.

25. I have experience with many such individuals, and am above that level of education and experience myself. When offering opinions about how one of ordinary skill in the art would evaluate or understand a particular issue, I have placed myself in the mindset of such a POSITA.

26. My opinions in this Declaration are limited to two claims of the '966 patent (claims 9 and 14) and two claims of the '275 patent (claims 1 and 5). The claims that I have been asked to address for purposes of CGI's Preliminary Injunction motion have very simple and clean infringement reads such that my opinion would not change under any reasonable definition of the POSITA.

Direct Infringement

27. It is my further understanding that to prove direct infringement of an asserted claim, a patent holder must establish by a preponderance of the evidence that all of the limitations of that claim are met by a product that is sold, offered for sale, imported into, or manufactured in the U.S. Thus, the absence of even a single limitation from an accused product precludes a finding of infringement of that claim.

28. It is my further understanding that a proper infringement analysis requires a two-step process consisting of:

a. Construing the asserted claims to determine their scope and meaning as discussed above, something that has been done in this case as I explained below; and then,

b. Comparing the construed claims to an accused product, where literal infringement requires that the accused product meet each limitation of the asserted claims as construed.

29. It is my further understanding that the burden of proving infringement is the preponderance of the evidence presented, where that standard means infringement is shown to be more likely than

not. Also, as a general matter, it is my understanding that a claim should not be limited to a preferred embodiment if the claim language does not so require, but in certain cases, the scope of the right to exclude may be limited by a narrow disclosure.

30. I also understand that every limitation of a claim is essential and that the absence of any one limitation avoids infringement. Finally, it is my understanding that, to infringe a dependent claim, the accused product must include each and every limitation of all claims from which it depends.

Claim Construction

31. It is my understanding that a first step in considering infringement of the claims of a patent is to construe the terms found in those claims in view of the patent's specification, file history, and the understanding of a POSITA. Absent a decision by the Court regarding any such constructions, for all of the terms found in the claims that I address in this Declaration I have used the ordinary and customary meanings of those terms to a POSITA when viewed in light of the specifications and file histories of each of those patents.

BACKGROUND OF THE '966 PATENT

32. The '966 patent is one of the two CGI patents that I have been asked to address in this Declaration. Its title is "BARRIER MOVEMENT OPERATOR BATTERY BACKUP AND POWER EQUIPMENT BATTERY CHARGING CENTER." The named inventor is Brian Frederic Butler. The application that led to the issuance of the '966 patent was filed on June 28, 2006 as Application No. 11/477,334. The patent issued on December 22, 2009. It is assigned to CGI.

33. As the ABSTRACT of the '966 patent (**Exhibit C**) explains, that patent discloses and claims:

> *A system [that] includes a rechargeable battery backup for a barrier movement operator. A barrier movement operator controls the movement of a moveable barrier. The barrier movement operator has a head unit to command the moveable barrier to perform moveable barrier functions. The head unit is supplied power by a power source. A battery charging station is in electrical communication with at least one rechargeable battery and in electrical communication with the head unit*

to supply power to the at least one rechargeable battery. Circuitry is electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit. The system also includes electrically powered equipment comprising an apparatus for receiving the at least one rechargeable battery. The electrically powered equipment is adapted to be powered by the at least one rechargeable battery to perform a predetermined function.

34. Simply put, the '966 patent teaches, as an example, a garage door opener with a rechargeable backup battery charger where in some instances a backup battery that can be charged in the charger can also be used to power other tools such as "a saw, drill, light, garden tool, or any other equipment or tool which is capable of being powered by a battery." *See* the '966 specification (**Exhibit C**) at 3:48-50.[1]

35. I have been asked to analyze two claims of the '966 patent. First, I have been asked to analyze claim 9. Claim 9 is an independent claim that recites:

9. A battery charging apparatus, comprising:

a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery, the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment; and

circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.

36. I have also been asked to analyze claim 14 of the '966 patent. Claim 14 is a dependent claim that depends on claim 9. Claim 14 recites:

[1] This notation identifies the column of the patent's specification and the lines within that column that I am citing to.

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14. The battery charging apparatus of claim 9, wherein the electrically powered equipment comprises a tool.

[redacted]

[redacted]

[redacted]

CGI's Practice of Claim 9

The Preamble

9[pre] A battery charging apparatus, comprising:

[redacted]

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HIGHLY CONFIDENTIAL OUTSIDE ATTORNEYS' EYES ONLY MATERIAL SUBJECT TO PROTECTIVE ORDER

[redacted]

Element 9[a][3]

9[a] a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery

42. [redacted]

Element 9[b]

9[b] the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment;

[redacted]

[3] For ease in reference to them, I have added alphanumeric identifiers to each of the elements of the claims addressed herein.

[redacted]

Element 9[c]

> *9[c] circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.*

---

[4] The Wayback Machine is a digital archive of the World Wide Web and other information on the Internet created by the Internet Archive, a nonprofit organization, based in San Francisco, California, United States. The Internet Archive launched the Wayback Machine in October 2001. The service enables users to see archived versions of web pages across time.

46. [redacted]

Summary Opinion

47. [redacted]

CGI's Practice of Claim 14

> *14. The battery charging apparatus of claim 9, wherein the electrically powered equipment comprises a tool.*

48. [redacted]

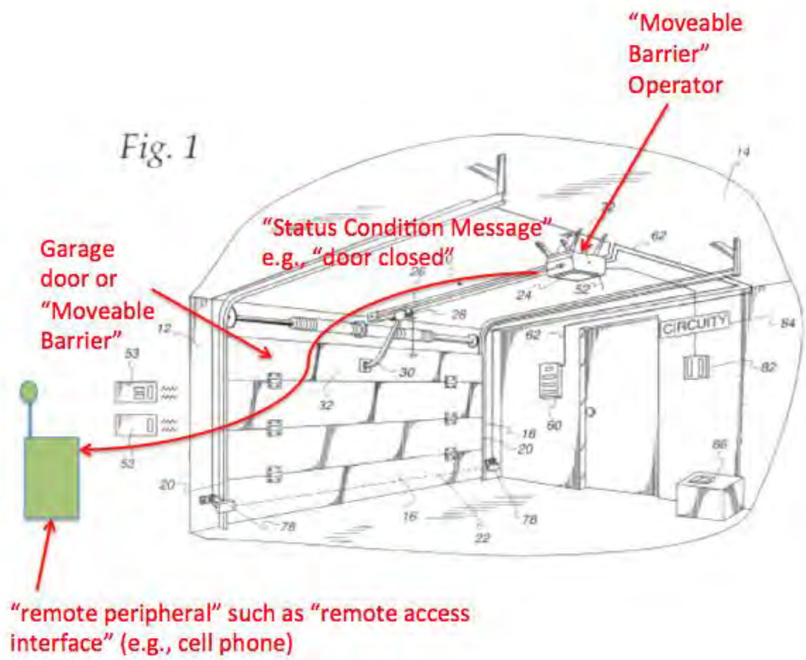
BACKGROUND OF THE '275 PATENT

49. The '275 patent is the second patent I have been asked to address in this Declaration. Its title is "MOVABLE BARRIER OPERATORS STATUS CONDITION TRANSCEPTION APPARATUS AND METHOD." The named inventor is James J. Fitzgibbon. The application that led to the issuance of the '275 patent was filed on May 29, 2003 as Application No. 10/447,663. The patent issued on May 29, 2007. It is assigned to CGI.

50. As the ABSTRACT of the '275 patent explains, that patent discloses and claims:

> *A movable barrier operator (10) has a wireless status condition data transmitter (15) that wirelessly transmits status condition messages to one or more remote peripherals (20). The latter can in turn use this status information to effect their own functionality and supported features.* (**Exhibit D** at ABSTRACT)

51. In simpler terms, and referring to Figure 1 of the ’966 patent (copied below with annotations added to explain what it depicts) as an exemplary garage door opener, the ’275 patent discloses a “moveable barrier” (such as a garage door) operator that communicates a “status” message (such as “garage is open” or “garage is closed”) to one or more peripherals (such as a cellular phone).



52. A representation of a system in keeping with the ’275 patent is provided in its FIG. 1 as copied below:

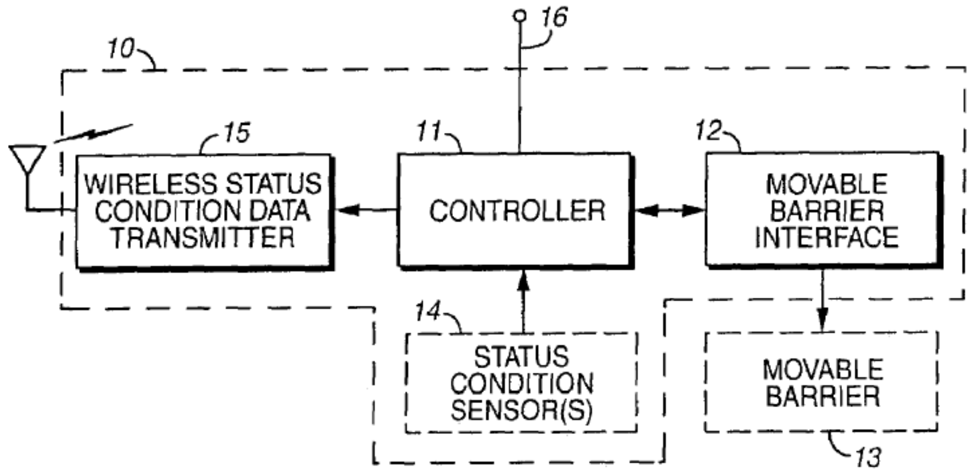


FIG. 1

53. FIG. 1 shows a MOVABLE BARRIER such as a garage door that is controlled by a CONTROLLER (such as one would find in a garage door opener mounted on the ceiling of a garage) that operates a MOVEABLE BARRIER INTERFACE (the mechanical subsystem that couples the moveable barrier to the controller that allows the controller to reposition the door. *See* **Exhibit D**, the ’275 specification, at 3:36-39). That CONROLLER is accessible by a WIRELESS STATUS CONDITION TRANSMITTER (which could be, for example, a cellular phone) that allows remote observation (for example, on a screen) and control of the barrier.

54. I have been asked to analyze two claims of the ’275 patent. First, I have been asked to analyze claim 1. Claim 1 is an independent claim that recites:

> *1. A movable barrier operator comprising:*
>
> > *a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;*
> >
> > *a movable barrier interface that is operably coupled to the controller;*
> >
> > *a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal that:*

corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and

comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

55. I have also been asked to analyze claim 5 of the ’275 patent. Claim 5 is a dependent claim that depends on claim 1. Claim 5 recites:

5. The movable barrier operator of claim 1 wherein the plurality of operating states includes at least one of:

moving a movable barrier in a first direction;

moving the movable barrier in a second direction;

reversing movement of the movable barrier;

halting movement of the movable barrier;

detecting a likely presence of an obstacle to movement of the movable barrier;

detecting a likely proximal presence of a human;

receiving a wireless remote control signal;

receiving a wireline remote control signal;

receiving a learning mode initiation signal;

a lighting status change;

a vacation mode status change;

detecting a likely proximal presence of a vehicle;

detecting the identification of a proximal vehicle; and

receiving an operating parameter alteration signal.

56. Based on the information provided to me, I understand that CGI currently practices the ’275 patent at least with its HD950WF garage door opener. I have reviewed materials on this

product and, as further described below, it is my opinion that CGI's HD950WF product meets every limitation of claims 1 and 5 of the '275 patent. I spoke with a Chamberlain technical director with respect to my analysis of the MyQ features discussed below for the HD950WF. Chamberlain confirmed that each of its connected or connectable products are implemented in the same fashion as the HD950WF with respect to the features discussed herein, or are designed to be implemented with an after-market accessory to function in this manner. Based on this conversation, I have attached as **Exhibit N** a list of Chamberlain products identified by their model numbers that are connected or connectable and would also practice the '275 patent.

CGI's Practice of Claim 1

The Preamble

57. The Preamble of claim 1 reads as:

> *1[pre] A movable barrier operator comprising:*

58. Because it is a garage door operator, the HD950WF Garage Door Opener is a movable barrier operator. Some of the characteristics of the opener are described on the title page of the manual: "1-1/4 hps* Belt Drive Garage Door Opener with MyQ® Smartphone Control and Battery Backup." *See* **Exhibit I**, *HD950WF Manual* at title page.

Element 1[a]

> *1[a] a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states*

59. The HD950WF Garage Door Opener contains a controller, which the manual describes as the "Receiver Logic Board", and is depicted as item 9 in the image below:

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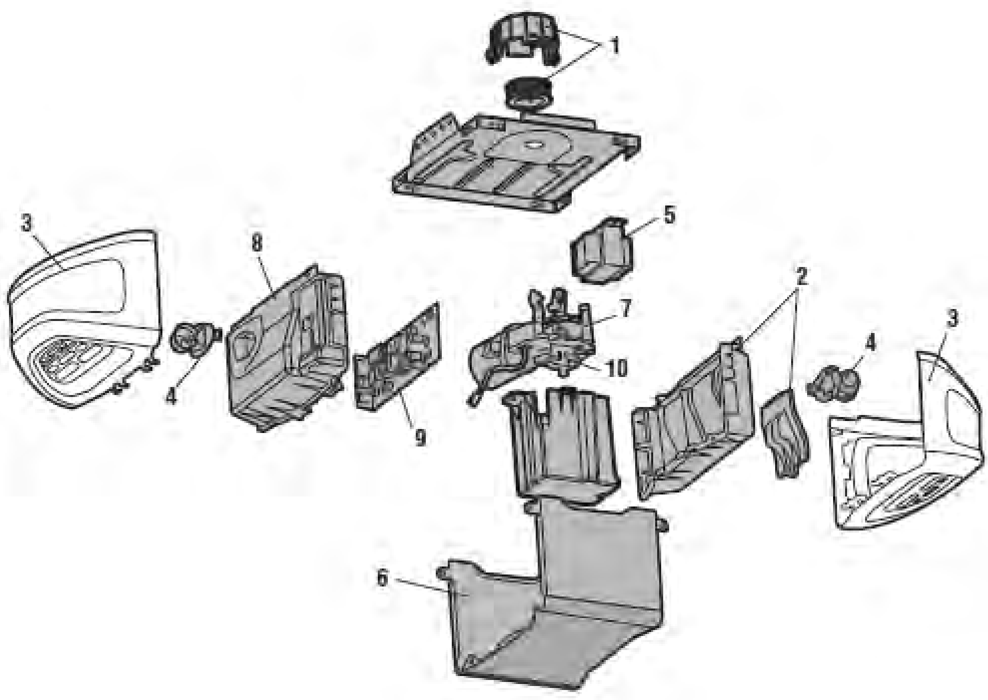


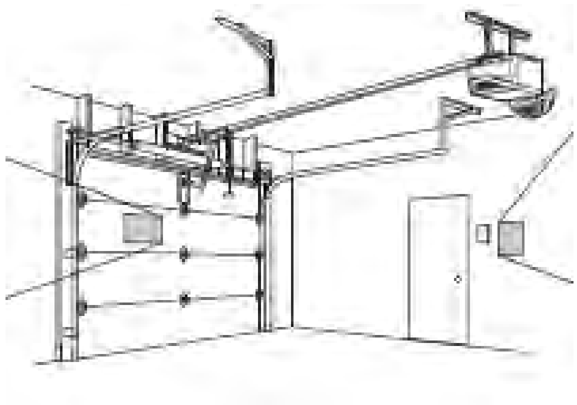
(**Exhibit I,** *HD950WF Manual* at page 43)

[redacted]

Element 1[b]

1[b] a movable barrier interface that is operably coupled to the controller

61. The HD950WF Garage Door Opener includes a movable barrier interface, operatively coupled to the controller, which is used to raise and lower the garage door opener. This includes the head unit, the motor within the head unit, the belt, and the rail along which the garage door is raised and lowered, all of which are depicted in this drawing taken from the HD950WF Manual:



(**Exhibit I**, *HD950WF Manual* at page 20)

Element 1[c]

> *1[c] a wireless status condition data transmitter that is operably coupled to the controller*

62. The HD950WF Garage Door Opener includes a wireless status condition data transmitter, which is used to send signals that the user can view through the MyQ app. The transmitter is depicted in the image below, which shows part of the connection process where the user connects a smartphone to the signal from the transmitter:

(**Exhibit I**, *HD950WF Manual* at page 31)

63. [redacted]

[redacted]

Wherein Clause Part 1[d]

1[d] wherein the wireless status condition data transmitter transmits a status condition signal that:

64. See my discussion of Elements 1[a] and 1[c] above, [redacted]

Wherein Clause Part 1[d][1]

1[d][1] [the wireless status condition data transmitter transmits a status condition signal that] corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and

65. See my discussion of Elements 1[a] and 1[c] above [redacted]

Wherein Clause Part 1[d][2]

1[d][2] the wireless status condition data transmitter transmits a status condition signal that] comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

[redacted]

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[redacted]

Summary Opinion

68. As shown above, the HD950WF Garage Door Opener meets all of the limitations of claim 1 of the ’275 patent.

CGI’s Practice of Claim 5

The Preamble

69. The Preamble of claim 5 of the ’275 patent reads as follows:

> *5. The movable barrier operator of claim 1 wherein the plurality of operating states includes at least one of:*

70. This shows that claim 5 depends from claim 1. I provided my opinion that the HD950WF Garage Door Opener meets all of the limitations of claim 1 above. Claim 5 adds an additional limitation requiring that and plurality of operational states required by claim 1 must include at least one of a list of possible operational states. I address one of those listed states in the following subsection. In so doing, I explain my opinion that the HD950WF Garage Door Opener at least one of the listed states.

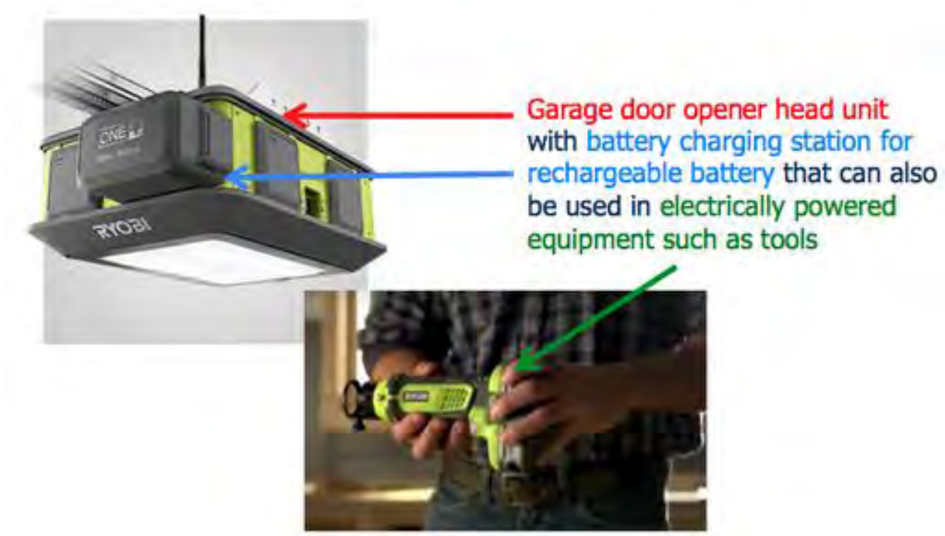
a lighting status change;

71. See my discussion of Element 1[a] above. [redacted]

THE ACCUSED RYOBI PRODUCT

72. As I note above, the accused product is the Ryobi Ultra-Quiet Garage Door Opener (the "Ryobi GDO") identified as the GD200 model of that product. As noted above, I have confirmed that this Ryobi product is sold in the U.S. by purchasing one of them from my local Home Depot store here in Austin, TX.

73. At its simplest level, the Ryobi GDO is a garage door opener that includes a battery charging station for a rechargeable battery that can also be used in electrically powered equipment such as tools. The product and its functionality are shown on Ryobi's own website:

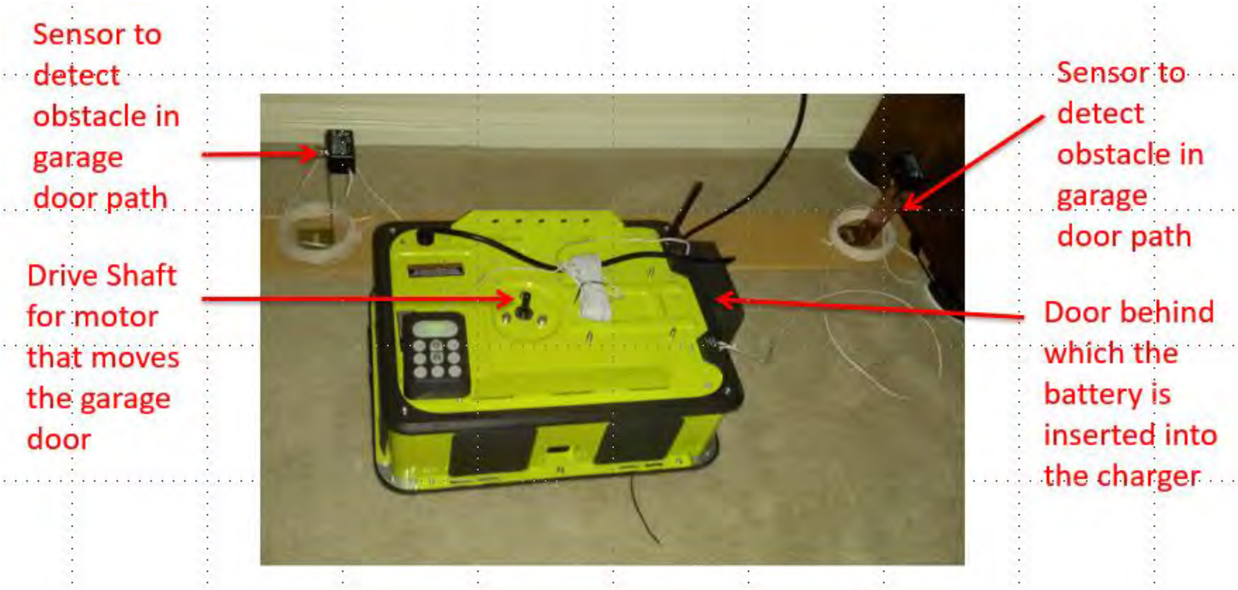


Images taken from *www.ryobitools.com/gdo/* (last visited on June 2, 2016)

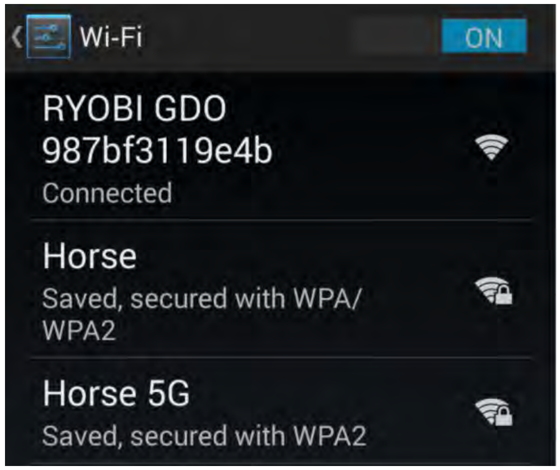
74. Most of the materials I initially analyzed for my Report were materials from Ryobi's own website. However, in order to confirm Ryobi's own advertising, I purchased and tested a Ryobi GDO in my own house and a set of Ryobi battery-powered tools.

75. After purchasing the Ryobi GDO, I connected it with the safety sensors and the wall-mounted pushbutton so that even though it was not actually connected to a garage door it could

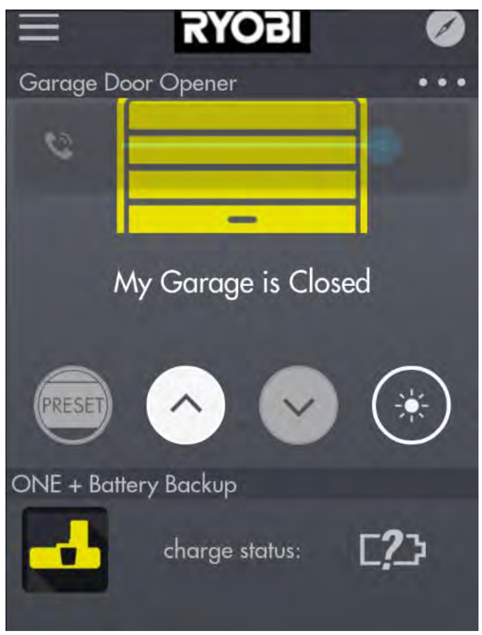
still be operated and I could observe its operation by hearing and seeing the motor move and the "beeps" produced when the unit was performing its door-closing cycle. A photograph of the system as connected together and operated in my home office is shown below. Note the manner in which I mounted the safety sensors on a board so they were facing each other:



76. After setting up the system shown in the above photograph, I installed the Ryobi app on both my iPhone and my Android phone. In so doing I followed the linking procedure shown by the app, including joining each of those phones with the Wi-Fi service provided by the Ryobi GDO after its Wi-Fi button had been activated. The name of that service included the multi-digit identifier assigned to that specific GD200 (987bf3119e4b). A screenshot taken from my Android phone when it was connected to the Wi-Fi signal being transmitted by the Ryobi GDO is shown below:



77. Following the installation procedure further, I joined the Ryobi GDO into my home Wi-Fi service (shown as Horse" above), a process that included entry of the password for that service. After than I was able to use both of my phones to control the Ryobi GDO to have it perform an OPEN and CLOSE operation, to see the change in status on the display of my phones, to turn the LED of the unit on and off, and to see the status of the LED reported as being changed. A screenshot from the Ryobi app taken from my Android phone, is shown below:



MY OPINIONS OF INFRINGEMENT

78. For the purpose of CGI's Preliminary Injunction motion, I was asked to consider whether the Ryobi GDO infringes claims 9 and 14 of the '966 Patent and claims 1 and 5 of the '275 Patent.

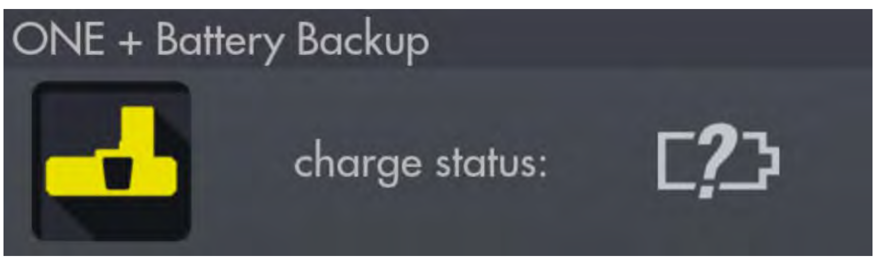
Based on my study of the Ryobi GDO and the two CGI patents, it is my opinion that the Ryobi GDO infringes at least claims 1 and 5 of the ’275 patent and at least claims 9 and 14 of the ’966 patent. I explain those opinions on a claim-by-claim basis below.

Infringement of Claim 9 of the ’966 Patent

The Preamble

9[pre] A battery charging apparatus, comprising:

79. Based on my use of a Ryobi GDO and my study of it, I have found that it contains a battery charging apparatus that charges one of the Ryobi ONE+ lithium batteries. As part of that study I purchased a P102 battery from Home Depot (the basic Ryobi GDO product does not include a back-up battery for the garage door operator) and plugged it into the battery charging socket on that device. Prior to that purchase, the Ryobi app on my phones reported that there was no back-up battery installed in the charging port of the Ryobi GDO. That is shown in the following portion of the screenshots provided above:



80. After I plugged in the new ONE+ battery, the apps showed that the battery was only partially charged as shown in the following screen shot reporting the status of the battery plugged into the Ryobi GDO charging port at 3:22 PM on May 27, 2016:

81. After leaving the battery in place for three hours, the battery was reported to be fully charged as shown in the following screenshot:

82. These screen shots confirm that the Ryobi GDO includes a battery charging apparatus, as made clear at *https://www.ryobitools.com/power-tools/products/details/802* (last visited May 27, 2016) as follows:

ULTRA-QUIET GARAGE DOOR OPENER

MODEL: #GD200 | HOME DEPOT SKU #: 1001755612

Get more out of your garage with RYOBI. Introducing the next generation of garage door openers with the RYOBI Ultra-Quiet Garage Door Opener. The ultra-powerful motor will quietly open and close large doors with ease due to the 2HPs for faster openings. With motion controlled overhead LED light has a selectable duration control so you are never left in the dark. Rest assured even in power outages, this unit is compatible with the RYOBI ONE+ system, and is battery backup ready with over 100 openings using a RYOBI ONE+ P108 4Ah Battery (sold separately).

83. *Also see* the following statement and illustration found on page 36 of the Operator's Manual (**Exhibit L**) for the Ryobi GDO. That statement confirms that the Ryobi GDO includes a battery charging apparatus, while the drawing shows the position where the battery is installed:

CHARGING A BATTERY PACK

See Figure 66.

Battery packs are shipped in a low charge condition to prevent possible problems. Therefore, you should charge them before first use. If the garage door opener does not charge the battery pack under normal circumstances, return both the battery pack and garage door opener to your nearest repair center for electrical check.

- Connect the garage door opener to an AC power supply.
- Install battery pack into the garage door opener as described earlier.
- Press on the battery pack to be sure contacts on the battery pack engage properly with contacts in the garage door opener.
- The battery pack may become slightly warm to the touch while charging. This is normal and does not indicate a problem.
- When the battery pack is fully charged, you may remove the battery pack or leave it in the battery port to provide DC power if needed.

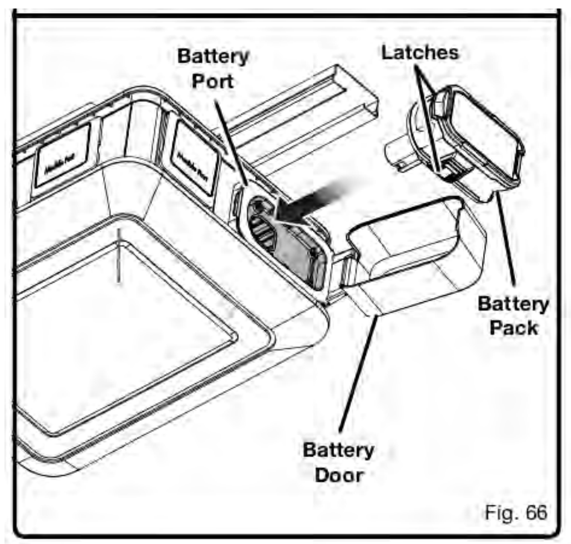


Fig. 66

84. *Also see* the GD200 Operator's Manual (*Id.*) at page 36 where the following "NOTICE" is provided:

> **NOTICE:**
>
> This product is designed to be powered by either a RYOBI ONE+™ 18V lithium-ion (Li-ion) battery pack (DC mode) or by electric power (AC mode). The unit will operate in AC mode whenever it is connected to an electric power source. It will switch to DC mode when an approved battery pack is installed and the unit is not connected to an AC power source.

85. This statement clearly shows that the ONE+ battery which can be connected to the Ryobi GDO acts as a "rechargeable battery backup for a barrier movement," something I have confirmed by removing the AC power to the Ryobi GDO in my office and then commanding it to move from the OPEN state to the CLOSED state and back while it was operating on only backup battery power.

Element 9[a]

> *9[a] a battery charging station in electrical communication with a rechargeable battery and in electrical communication with a head unit of a barrier movement operator for supplying power to at least one rechargeable battery*

86. The Ryobi GDO includes a battery charging station that, when a ONE+ battery is installed into that station, is in electrical communication with that battery. *See* the "CHARGING A BATTERY PACK" statement and the depiction of the charging station copied from the GD200 Operators' Manual (**Exhibit L**) in ¶ 83 above.

87. *Also see* the following pictures showing the battery charging apparatus of the Ryobi GDO taken from the *Ultra-Quiet Garage Door Opener* webpage of Ryobi Power Tools as found at *https://www.ryobitools.com/power-tools/products/details/802* (last visited May 27, 2016).

Element 9[b]

> *9[b] the at least one rechargeable battery being removably connectable to electrically powered equipment other than and physically separate or separable from the barrier movement operator to provide power to the electrically powered equipment;*

88. The fact that the ONE+ battery can power electrically powered equipment in addition to the Ryobi GDO is shown in the following photograph I took at an Austin Home Depot while there to purchase the Ryobi GDO on May 26, 2016:

89. *Also see* the statement made under the heading *About the ONE+ System* at the *https://www.ryobitools.com/power-tools/products/list/family/one-plus* webpage (last visited May 27, 2016):

> The RYOBI 18V ONE+ System has more than 70 tools that work with the same battery platform, giving you the ultimate versatility in tool selection to get your job finished. With upgraded LITHIUM+ batteries, you can get more done in less time and improve the performance of every RYOBI 18V tool ever made. No matter how you add it up, ONE+ is the one system that delivers more.

90. An example of the manner in which a ONE+ battery can be removed from the charging station of the Ryobi GDO and then connected to a Ryobi power tool (electrically powered equipment) are shown below, taken from *18V One+ Hammer Drill Kit*, *https://www.ryobitools.com/power-tools/products/details/657* (last visited May 27, 2016). The ONE+ battery is shown at the bottom of the Hammer Drill's handle. I have highlighted that ONE+ battery in red:

91. Other Ryobi tools which use the ONE+ battery are shown below, taken from the amazon.com website. Left to right, these Ryobi ONE+ tools are a nail gun, an orbital sander, and a reciprocating saw, each of which is powered by the same ONE+ battery that is used for back-up by the Ryobi GDO:

92. As further evidence of the manner in which the Ryobi Garage Door Operator can charge a battery which can then be used to power electrically powered equipment, I purchased a set of four Ryobi power tools from Home Depot. Those tools included a flashlight, a saber saw, a rotary saw, and a drill. Those tools are shown in the photographs copied below. The left picture is the box that provided four tools and a carrying bag. The right picture shows the four tools and the battery that I had charged by leaving it in the battery charging station of the Ryobi GDO for an hour or so:

93. I then charged a battery using the charging station provided by the Ryobi GDO and, one by one, confirmed that when I removed that battery and connected it with the tools shown above, the tools operated properly.

Element 9[c]

> *9[c] circuitry electrically connected to the battery charging station to supply power from the at least one rechargeable battery to the head unit.*

94. The fact that the head unit of the Ryobi GDO includes circuitry connected to an installed and charged ONE+ battery to supply power to the head unit is evident from the manner in which that battery was able to cause the Ryobi GDO to change its status from OPEN to CLOSED when the AC power was disconnected from it during my testing of the Ryobi GDO. *Also see* the

reference to "OPENS 100+ times" found in the following excerpt of the webpage found at *https://ryobitools.com/gdo/opener/* (last visited May 27, 2016).

95. *Also see* the following statement found on the webpage at *https://www.ryobitools.com/gdo/opener* (last visited May 27, 2016):

> Ensure your opener functions, even when your power fails, by connecting any RYOBI ONE+ battery.

96. *Also see* the statement made on the webpage at *https://www.ryobitools.com/power-tools/products/details/802* that:

> Rest assured even in power outages, this unit is compatible with the RYOBI ONE+ system, and is battery backup ready with over 100 openings using a RYOBI ONE+ P108 4Ah Battery (sold separately).

97. *Also see* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual:

> **BATTERY BACKUP**
> When not connected to an AC power source, the garage door opener and LED lights can be operated with RYOBI 18 Volt ONE+™ lithium-ion batteries.

Summary Opinion of Infringement of Claim 9

98. Given the explanations provided above for each limitation of claim 9 of the ’966 patent, in my opinion the Ryobi GD200 Garage Door Opener literally infringes claim 9.

Infringement of Claim 14 of the ’966 Patent

14. The battery charging apparatus of claim 9, wherein the electrically powered equipment comprises a tool.

99. Claim 14 depends from claim 9 of the ’966 patent. I explained my opinion that the Ryobi GDO meets all of the limitations of claim 9 above. As to the additional limitation added to claim 9 by dependent claim 14, I provided evidence that the electrical powered equipment which can be powered by the same ONE+ rechargeable battery that can serve as the back-up power supply for the Ryobi GDO can also be used to power over 70 Ryobi tools such as those identified in ¶¶ 88 to 91 above. Thus, the Ryobi GDO meets all of the limitations of both claims 9 and 14, thereby infringing claim 14.

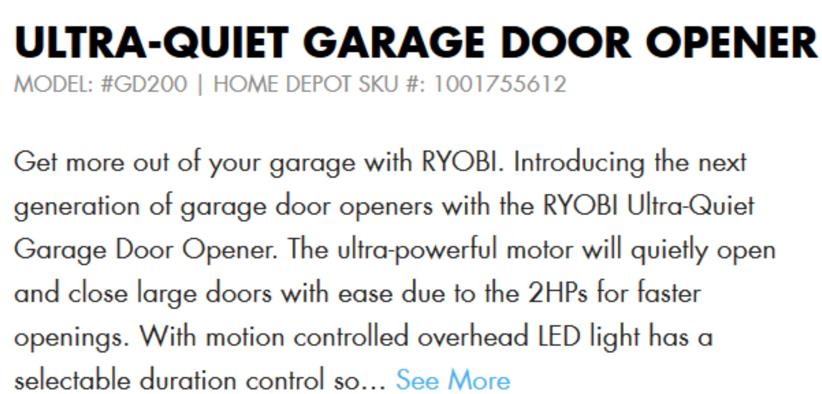
Infringement of Claim 1 of the ’275 Patent

The Preamble

100. The Preamble of claim 1 reads as:

1[pre] A movable barrier operator comprising:

101. Because it is a garage door operator, the Ryobi GDO is a moveable barrier operator as is shown in the following excerpt taken from the *www.ryobitools.com/power-tools/products/details/802* website (last visited May 26, 2016:


ULTRA-QUIET GARAGE DOOR OPENER

MODEL: #GD200 | HOME DEPOT SKU #: 1001755612

Get more out of your garage with RYOBI. Introducing the next generation of garage door openers with the RYOBI Ultra-Quiet Garage Door Opener. The ultra-powerful motor will quietly open and close large doors with ease due to the 2HPs for faster openings. With motion controlled overhead LED light has a selectable duration control so… See More

102. *Also see* the manner in which the Ryobi GDO is connected to a garage door (a movable barrier) taken from page 3 of the Operator's Manual for the Ryobi GDO available on the Internet at:

https://manuals.ttigroupna.com/system/files/9593/original/GD200_698_trilingual.pdf (last visited on May 26, 2016). The Ryobi GDO has been highlighted in red:

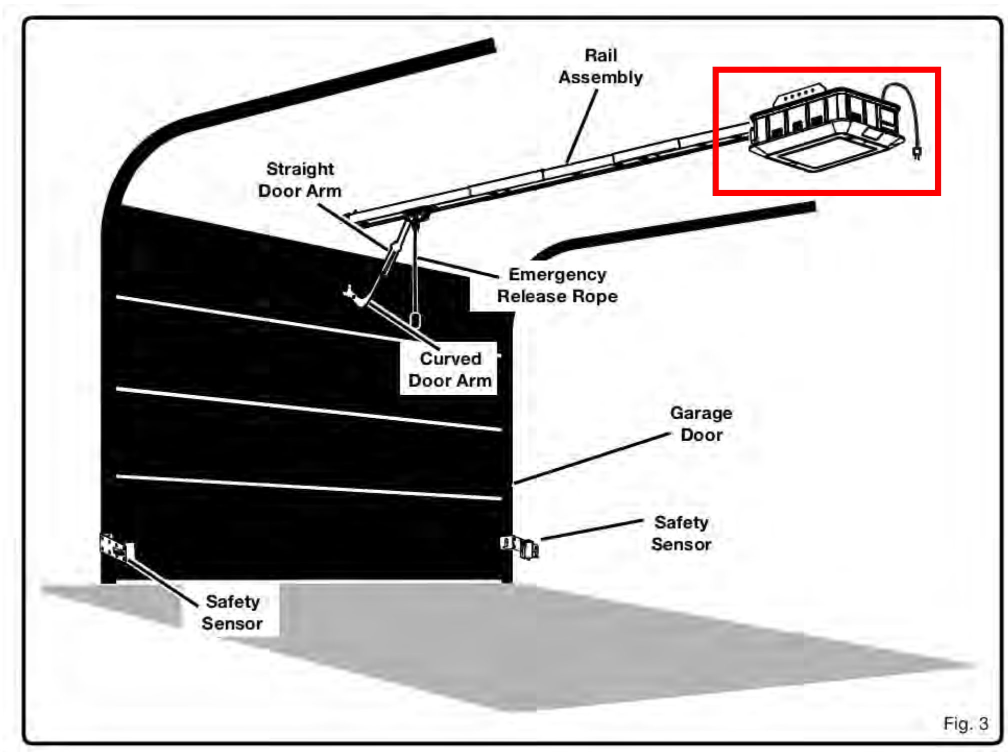


Fig. 3

Element 1[a][5]

> *1[a] a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states*

103. Based on my study of the control head of the Ryobi GDO system that I purchased as part of my study of that product, that portion of the Accused Ryobi GDO Product includes a controller in the form of a printed-circuit board having electronics that, among other things, has at least two operational status conditions in the form of the condition when the controller has raised the

---

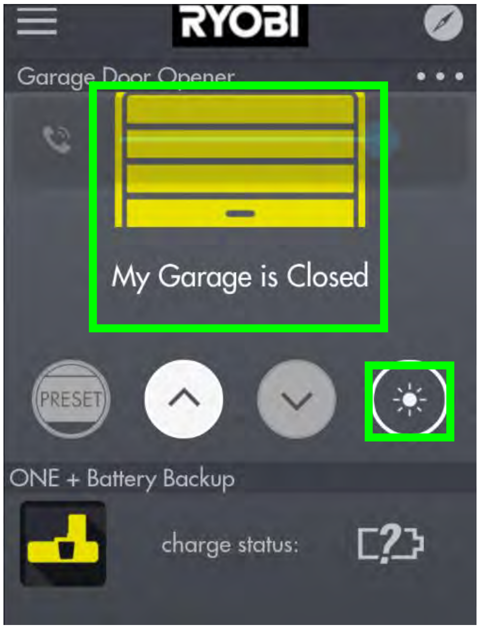
[5] For ease in reference to them, I have added alphanumeric identifiers to each of the elements of the claims addressed herein.

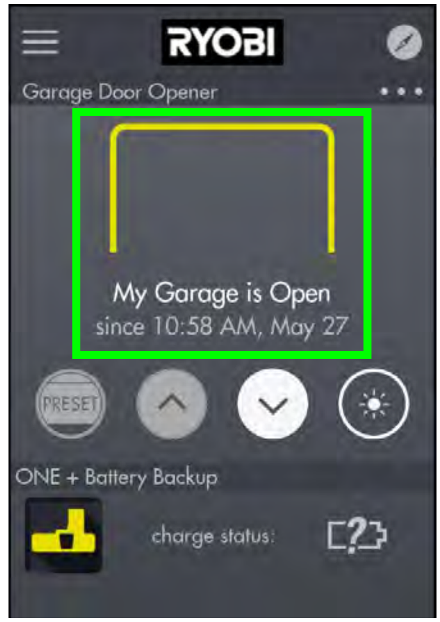
associated garage door ("OPEN") and the condition where the controller has lowered the associated garage door ("CLOSED"). A photograph of that control board is shown below, taken from the Application for Equipment Authorization by the U.S. FCC made on behalf of the Ryobi GDO product by One World Technologies. Internal photographs of that product, which has been assigned the identifier "FCC ID VMZGD200," are available at *https://www.fcc.gov/general/fcc-id-search-page*. A photograph of the "Main Board" within that operator as provided to the FCC is copied below. The board has been highlighted in yellow:

Main Board

(**Exhibit M** at page 2)

104. As evidence of the controller having the OPEN and CLOSED status conditions, *see* the two screenshots I captured from my Android before I commanded the controller to open the door, and after that operation had taken place. The larger green boxes highlight the portions of the displays that indicated the two statuses of the controller.



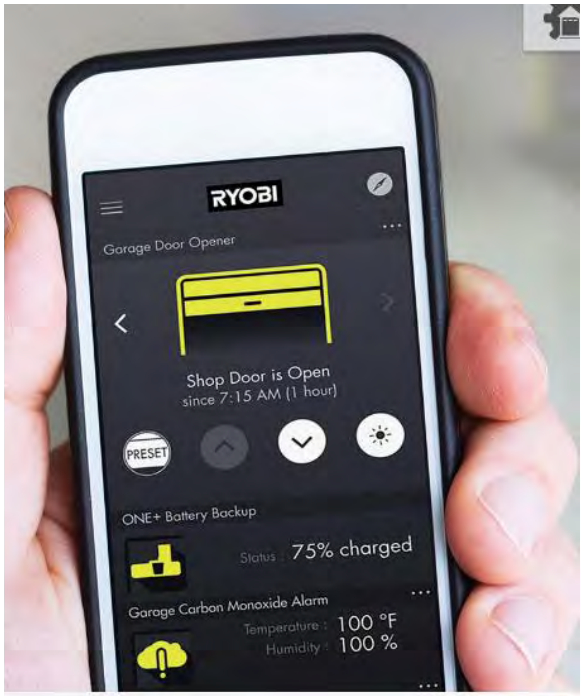


105. Further, the smaller green box on the above left shows an additional status condition, that being the fact that the light of the Ryobi GDO is currently OFF. The provision of that light (actually, an LED) is shown in the following excerpt from the Ryobi website (last visited May 26, 2015):

> The next generation in garage door openers has arrived. RYOBI introduces the most powerful and quietest garage door opener…ever. The RYOBI Ultra-Quiet Garage Door Opener boasts a 2HPs motor, giving you faster openings and prolonging motor life. An integrated long lasting LED light keeps your garage illuminated and ensures you don't spend time changing out light bulbs.

106. The displays shown above, as well as my observation of the Ryobi GDO in operation, show that it has a plurality of potential operational status conditions defined by a plurality of operating states.

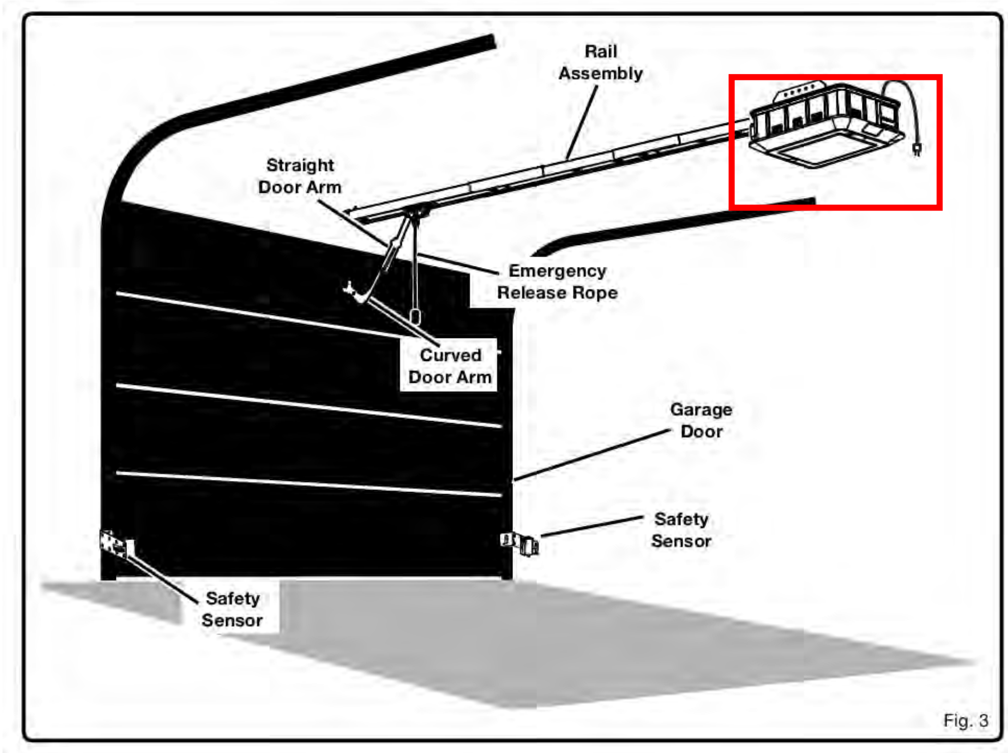
107. My testing confirms Ryobi's own materials which illustrate the plurality of potential operational status conditions defined, at least in part, by a plurality of operating states as seen in this image on the Ryobi website (https://www.ryobitools.com/gdo/), which shows the position of the door, the status of the light, and the status of the battery being charged.



Element 1[b]

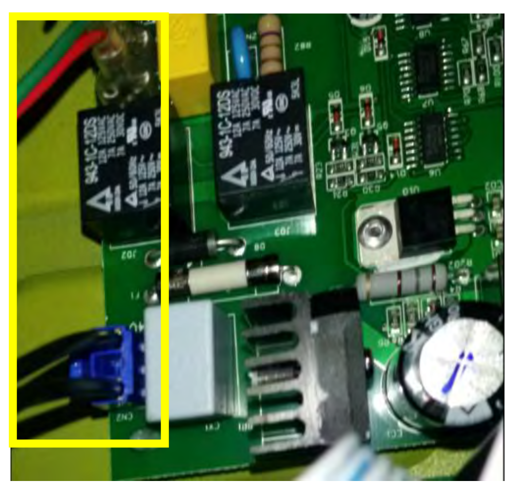
1[b] a movable barrier interface that is operably coupled to the controller

108. The Ryobi GDO includes the typical powering unit of a GDO, that being the motor that raises and lowers the garage door (the GDO uses a 2 horsepower motor), along with the electrical components which control the motor and the mechanical components that link that motor to the steel reinforced belt used to create that movement. That electrical and mechanical system is the "movable barrier interface" to the controller of Element 1[a]. Under user command either locally with a wall-mounted pushbutton, or remotely with the Ryobi app, the controller causes the motor to raise and lower the door by means of moving a steel reinforced belt drive that is mechanically connected to the door. A depiction of the overhead unit of the Ryobi GDO and its coupling to the garage door are shown below, taken from the same figure from the Ryobi GDO operators manual that I introduced in ¶ 102 above. Here, I have identified the head unit which connects to the mechanical portion of the interface between the garage door and the Ryobi GDO in red:



109. The electrical portion of the interface between the controller within the Ryobi GDO is shown in the following left-side photograph of the interior of the Ryobi GDO. The yellow highlight identifies the electrical connections between the controller board and the motor and other electrical components of that device. This photograph was obtained from the same FCC website I identified above. The right-side photograph is one I took myself. It shows a portion of the control board in the Ryobi GDO that I purchased, including the heavy-gauge wires boxed in yellow which connect that controller card to the motor that is used to reposition the garage door.

THE UNCOVER EUT VIEW 1



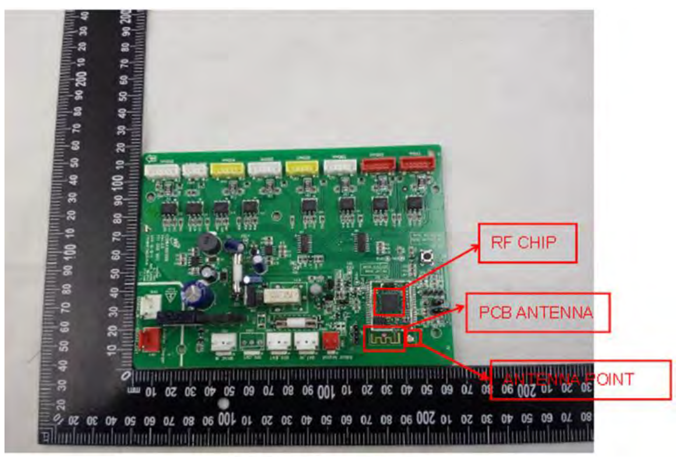
(**Exhibit M** at page 1)

110. The above evidence confirms that the Ryobi GDO includes a movable barrier interface that is operably coupled to the controller. By opening the Ryobi GDO that I bought, I have confirmed that the garage door opener products being sold by Ryobi appear to match what Ryobi publicly disclosed in the FCC application and other evidence I cited above. Specifically, when I opened the head unit of my Ryobi GDO, its interior looked substantially similar to the left-side picture above, including the controller and wires connecting the controller to other aspects of the head unit.

Element 1[c]

1[c] a wireless status condition data transmitter that is operably coupled to the controller

111. The Ryobi GDO includes a wireless Wi-Fi transmitter that is operably connected to the controller. The components of that interface are indicated in the following annotated photograph taken from the same FCC website identified above. The highlighting was provided by Ryobi. It shows the RF (radio frequency) chip and antenna within the Ryobi GDO's wireless transmitter.

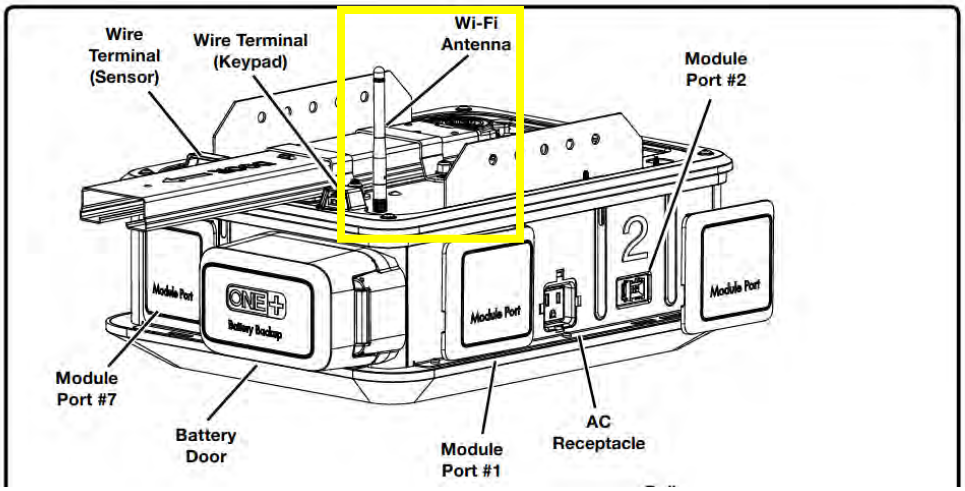


WIFI MODE (Front)

(**Exhibit M** at page 3)

112. The Ryobi GDO also has an external Wi-Fi antenna as shown in the following depiction, taken from Fig. 4 of the Operator's Manual for that Ryobi product as available online at:

https://manuals.ttigroupna.com/system/files/9593/original/GD200_698_trilingual.pdf (last visited on May 26, 2016). The antenna is part of the controller's wireless transmission system. It is highlighted in yellow:



113. Further evidence of the wireless transmission capability of the Ryobi GDO is found in its capability to link with a cellular telephone via a Wi-Fi connection to a router that provides access to the Internet. *See* the following excerpt taken from the webpage available at *https://www.ryobitools.com/gdo/opener* (Last visited May 26, 2016).

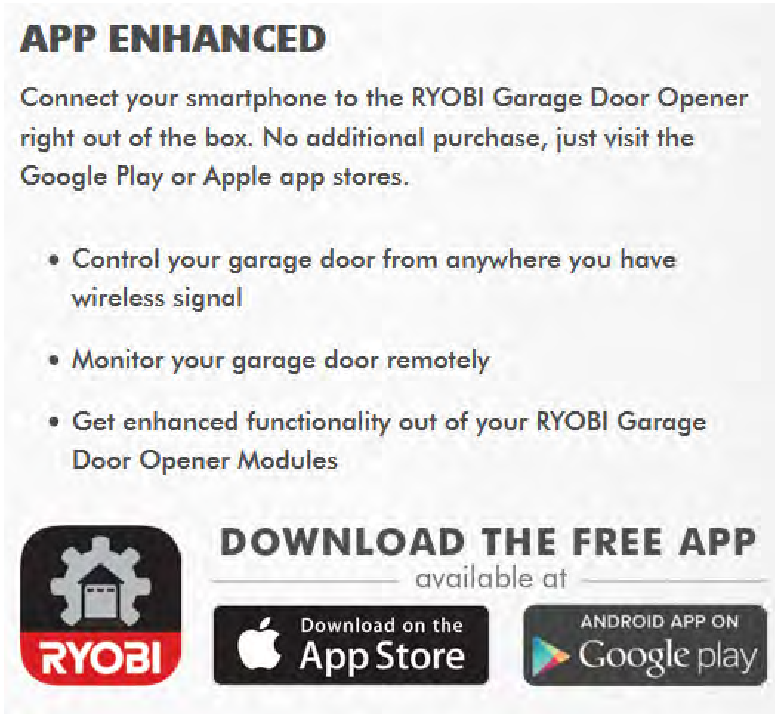
> Download the RYOBI Garage Door Opener App to monitor and control your garage remotely from your smartphone. E

114. The screen shots shown above provide evidence that the Ryobi GDO uses its Wi-Fi transmitter to send status condition data relating to the status of the controller to cellular telephones which have the Ryobi app installed. The evidence shows that the Ryobi GDO includes a wireless status condition data transmitter that is operably coupled to the controller.

Wherein Clause Part 1[d]

> *1[d] wherein the wireless status condition data transmitter transmits a status condition signal that:*

115. *See* my discussion of Elements 1[a] and 1[b] above, including the screenshots of the Ryobi app installed on my cellular phones. *Also see* the following excerpt taken from the webpage available at *http://ryobitools.com/gdo/module-system/#app-enhanced* (last visited May 27, 2016). That statement shows that with the Ryobi app, a user can "monitor" the status of the garage door remotely by receiving transmitted status signals:



116. The above evidence shows that the wireless status condition data transmitter of the Ryobi GDO uses Wi-Fi to transmit a status condition signal that ultimately reaches the Ryobi app on a linked cellular phone.

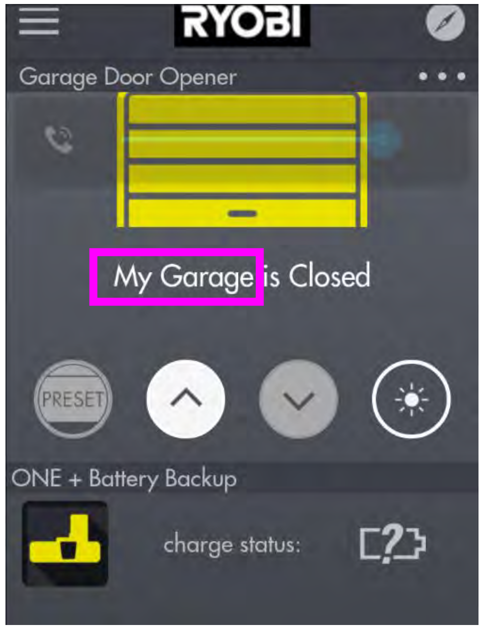
Wherein Clause Part 1[d][1]

> *1[d][1] [the wireless status condition data transmitter transmits a status condition signal that] corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states; and*

117. *See* my discussion of Elements 1[a] and 1[b] above, noting that the Ryobi GDO uses Wi-Fi to transmit the present operational status of that controller (door OPEN or CLOSED, LED ON or OFF) to a cellular phone running the Ryobi app.

Wherein Clause Part 1[d][2]

> *1[d][2] the wireless status condition data transmitter transmits a status condition signal that] comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.*



118. Here, I first point out that the Ryobi GDO must transmit an identifier that identifies the specific unit that I named "My Garage" over its Wi-Fi connection, otherwise there would be no way for the Ryobi apps running on my phones to receive the name of that specific controller as shown above.

119. Further, I am aware that technicians at the CGI laboratory in Illinois have set up an RF detection system using an application named *Wireshark* to capture the data that is sent out from a Ryobi GDO they installed at that laboratory. I have visited that laboratory a number of times in the past, and am personally familiar with the use of Wireshark to capture the data contained in Wi-Fi transmissions. I have discussed the test procedures use by those technicians with them. They have informed me that their *Wireshark* testing captured messages being sent from the Ryobi GDO they were testing which included the MAC address[6] of the Wi-Fi chip in that unit. That address

---

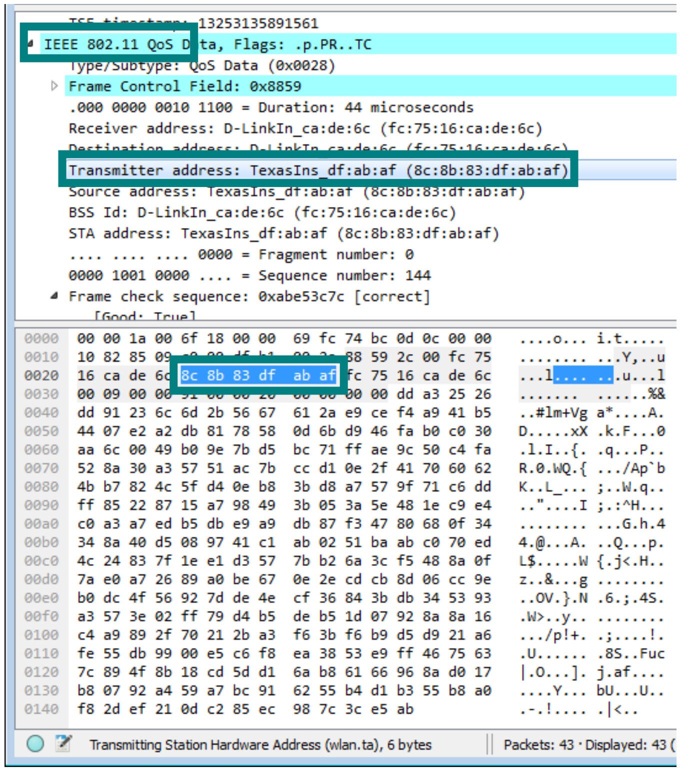
[6] A MAC Address is an acronym for a "media access control address," an identifier also called a "physical address." A MAC address is a unique identifier assigned to a device's network interface for use during communication on a network. MAC addresses are used as a network address for most IEEE 802 network technologies, including Ethernet and Wi-Fi. MAC addresses are most

was identified on a chip within the Ryobi GDO being tested at CGI. That chip is shown in the following photograph:

120. Knowing that specific MAC address, the CGI technicians examined the data captured by the Wi-Fi transmissions of the Ryobi GDO they were testing to see if that address was present in the data within any of those transmissions. As the following exemplary print-out shows, their use of *Wireshark* did identify a Wi-Fi transmissions containing that specific MAC address. *Also note* the use of the IEEEE 802.11 protocol:

---

often assigned by the manufacturer of a network interface controller (NIC) and are stored in its hardware.



121. The above evidence shows that the wireless transmissions from the Ryobi GDO do include an identifier that is at least relatively unique to the specific movable barrier operator being tested, such that the status condition signal substantially uniquely identifies that specific movable barrier operator.

122. As further evidence of the uniqueness of the MAC address provided by the Ryobi Garage Door Operators, the following photograph shows the same chip as the one pictured in ¶ 119 above, but this picture being of the one in the Ryobi Garage Door Operator I purchased in Austin. As can clearly be seen, that operator had a different MAC address from that of the operator tested in Chicago:

Summary Opinion of Infringement of Claim 1

123. Given the explanations provided above for each limitation of claim 1 of the '275 patent, in my opinion the Ryobi GD200 Garage Door Opener literally infringes claim 1.

Infringement of Claim 5 of the '275 Patent

The Preamble

124. The Preamble of claim 5 of the '275 patent reads as follows:

> *5. The movable barrier operator of claim 1 wherein the plurality of operating states includes at least one of:*

This shows that claim 5 depends from claim 1. I provided my opinion that the Ryobi GDO meets all of the limitations of claim 1 above. Claim 5 adds an additional limitation requiring that and plurality of operational states required by claim 1 must include at least one of a list of possible operational states. I address a number of those listed states in the following subsections. In so doing, I explain my opinion that the Ryobi GDO has many more than one of the listed states. All of the citations provided below have been taken from the GD200 Operator's Manual available at:

https://manuals.ttigroupna.com/system/files/9593/original/GD200_698_trilingual.pdf

(last visited on May 28, 2016).

moving a movable barrier in a first direction;

125. The GD200 is capable of moving a garage door into the CLOSED position, something shown in the video available via the WATCH VIDEO link on the *https://www.ryobitools.com/gdo/* website (last visited on May 28, 2016). *Also see* the following excerpt from page 3 of the GD200 Operator's Manual (**Exhibit L**):

> ■ Devices or features, such as the RYOBI Garage Door Opener Module System App, that allow you to open and close the garage without the garage door being in view should only be used with sectional garage doors.

moving the movable barrier in a second direction;

126. The Ryobi GDO is capable of moving a garage door into the OPEN position, something shown in the video available via the WATCH VIDEO link on the *https://www.ryobitools.com/gdo/* website (last visited on May 28, 2016). *Also see* the following excerpt from page 3 of the GD200 Operator's Manual (**Exhibit L**):

> ■ Devices or features, such as the RYOBI Garage Door Opener Module System App, that allow you to open and close the garage without the garage door being in view should only be used with sectional garage doors.

reversing movement of the movable barrier;

127. *See* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L** at page 12):

> **AUTOMATIC REVERSAL SYSTEM**
>
> When a closing garage door contacts an object that is 1-1/2 in. above the garage floor, the automatic reversal system will stop and raise the door to the fully open position.

halting movement of the movable barrier;

128. *See* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L**):

> **SAFETY SENSORS**
>
> Your garage door opener comes with two sensors that cast an invisible light beam across the opening of your garage. If an object crosses the path of the beam while the garage door is closing, the door will automatically stop and reverse to the fully open position.

detecting a likely presence of an obstacle to movement of the movable barrier;

129. *See* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L**):

> **AUTOMATIC REVERSAL SYSTEM**
>
> When a closing garage door contacts an object that is 1-1/2 in. above the garage floor, the automatic reversal system will stop and raise the door to the fully open position.

detecting a likely proximal presence of a human;

130. I have observed that when I walk near to the Ryobi GDO located in my office it turns ON the LED if it is OFF. *Also see* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L**):

> **MOTION SENSING**
>
> Passive infrared motion sensing turns the LED lights on when movement is detected in the garage.

receiving a wireless remote control signal;

131. I have observed the capability of the Ryobi GDO to receive a wireless remote control signal either from a learned keypad or from one of my cellular phones having the Ryobi app installed. *Also see* the following excerpts taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L**):

> **ANTENNAS**
>
> The Wi-Fi and RF antennas allow the garage door opener to communicate with the smartphone app, car remotes, and outdoor keypads.

> **SMART PHONE COMPATIBILITY**
>
> The garage door opener can be operated remotely with a smart phone using the RYOBI Garage Door Opener Module System App. For more information, visit ryobitools.com or download the app from the **App Store** or **Google Play Store**.

receiving a learning mode initiation signal;

132. I have observed the use of the Ryobi GDO's PROGRAM button to learn a pushbutton keypad during the time when the unit is in its learning mode. *Also see* the following excerpt taken from page 45 of the GD200 Operator's Manual (**Exhibit L** at page 46):

> ■ Press and hold the **PROGRAM** button on the garage door opener's console until the garage door opener's LED lights turn off and the light behind the **PROGRAM** button on the console flashes three times. This indicates the console is in programming mode.

a lighting status change;

133. As I pointed out in ¶ 105 above, I have been able to observe a change in the lighting status (ON or OFF) of the Ryobi GDO. *Also see* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L** at page 12):

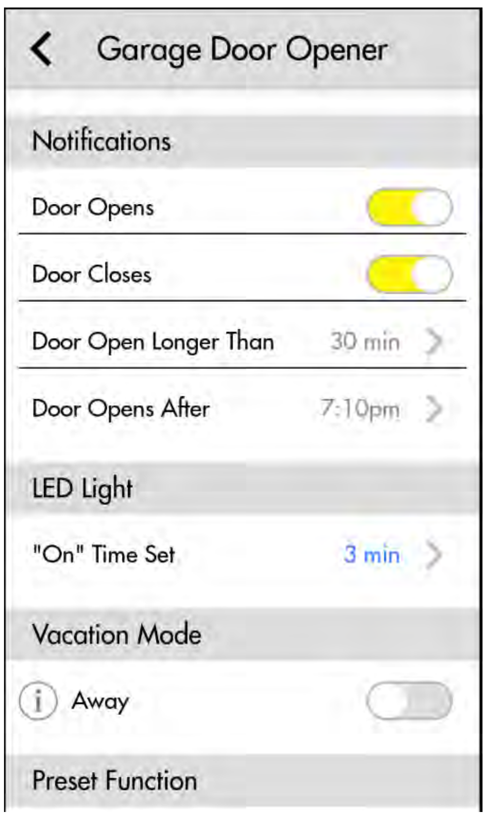
LED LIGHTS

LED lights are located beneath the light cover and illuminate whenever the motor is running, the **LIGHT** ( ) button on the indoor keypad is pressed, or motion is detected. To turn the LED lights off, press the **LIGHT** ( ) button.

NOTE: By default, the LED lights will illuminate for three minutes after the **LIGHT** ( ) button is pressed. The time can be adjusted in one minute increments, between three and ten minutes, using the RYOBI Garage Door Opener Module System App.

a vacation mode status change;

134. I have observed the programmable Vacation Mode setting provided by the Ryobi app as shown in the following screenshot from my Android phone. Changing that setting causes a change of status of the Ryobi GDO to cause it to shift into its vacation mode.



135. *Also see* the following excerpt taken from the "FEATURES" listing found on page 12 of the GD200 Operator's Manual (**Exhibit L** at page 12):

VACATION MODE

To enter and exit vacation mode, press the **LOCK** (🔒) button on the indoor keypad. When in vacation mode, the garage door opener can only be controlled by the indoor keypad and smart phone app.

Summary Opinion of Infringement of Claim 5

136. Given the explanations provided above for each limitation of claims 1 and 5 of the '275 patent, in my opinion the Ryobi GD200 Garage Door Opener literally infringes claim 5 by providing at least one of the listed operational status conditions of claim 5.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed at Austin, TX this 10th day of June, 2016.

V. Thomas Rhyne

V. Thomas Rhyne, Ph.D., P.E., R.P.A.

EXHIBIT J

FILED UNDER SEAL

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SUBJECT TO PROTECTIVE ORDER

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To the contrary, unique identifiers were well known in the art. For example, on December 1, 1999, Bluetooth issued its Bluetooth Specification Version 1.0B, defining a Bluetooth device address ("BD_ADDR") as "the 48-bit IEEE address which is unique for each Bluetooth unit." (Ex. K at 143.)[4] [redacted] Thus, the unique device identifiers of Claim 1 existed well before CGI filed the '275 Patent.

Media Access Control ("MAC") addresses were similarly well known before CGI filed the '275 Patent. According to Dr. Rhyne, "a MAC address is a unique identifier assigned to a device's network interface for use during communication on a network." (Rhyne Decl. ¶ 43, n. 6.) [redacted] [redacted]

One of CGI's other patents, U.S. Patent No. 4,750,118, which issued on June 7, 1998 and predates the '275 patent by several years, teaches remote transmitters in GDOs where "each transmitter has its own unique and permanent nonuser changeable code" and a receiver being "capable of storing and remember a number of different codes corresponding to different transmitters." (Ex. F at 1:33-43.) Thus, the '275 patent's claimed identifier is not new or inventive.

b. Menard Anticipates The '275 Patent

"A patent is invalid for anticipation if a single prior art reference discloses each and every

[4] BD_ADDRs are derived from the Institute of Electrical and Electronic Engineers ("IEEE") Standard IEEE802, version 1.0 of which was originally published in 1999. (Ex. K.)

limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in a single anticipating reference." *Schering Corp. v. Geneva Pharm., Inc*., 339 F.3d 1373, 1377 (Fed. Cir. 2003). In preliminary injunction cases, the Federal Circuit has held a defendant raises a substantial question of anticipation even when all elements are not necessarily disclosed in one reference. *Helifix Ltd. v. Block-Lok, Ltd.*, 208 F.3d 1339, 1352 (Fed. Cir. 2000).

Here, disclosures of the prior art raise substantial questions regarding the validity of the '275 Patent. For example, U.S. Patent Application Publication No. 2002/0183008 to Menard ("Menard"), titled "Power Door Control and Sensor Module for a Wireless System" and published on December 5, 2002, discloses each element of Claim 1 of the '275 patent. (Ex. C.)

To begin with, Menard discloses the movable barrier operator required by the Preamble of Claim 1. (*Id.* ¶ [0022]) ("In the figure, GDO 10 represents a garage door opener."). Figure 2 of Menard also discloses the "controller" or "processor" identified in Claim 1.

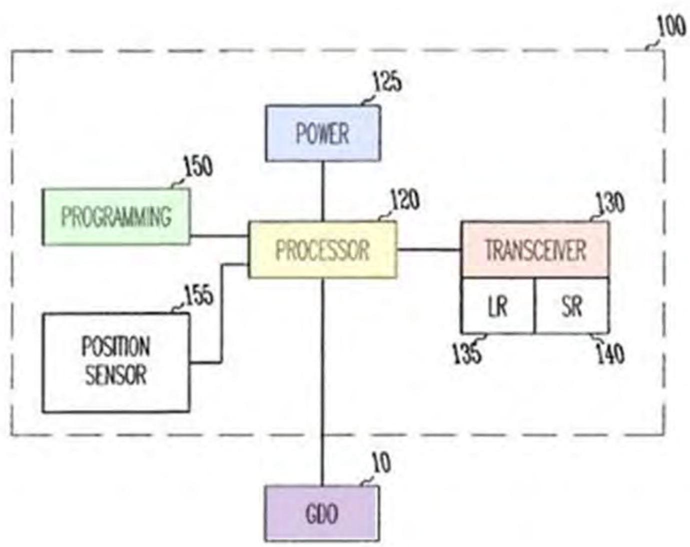

Fig.2

(*Id.*) The Menard "processor" has "a plurality of potential operational status conditions, defined, at least in part, by a plurality of operating states" as required by the first limitation of Claim 1. (Ex. A at 8:6-8; Madisetti Decl. ¶¶ 61-65.) According to Menard, "[a]mong the programming functions in one embodiment are instructions for causing processor 120 to ***actuate a particular control upon receiving a predetermined signal***. For example, if a garage door position sensor indicates that the ***door is in a raised position*** and ***an obstruction in the path of the garage door*** travel is detected by an optical sensor, then a signal received by the processor requesting the door to be closed is met with programming requesting that the obstruction be cleared before the door will travel." (Ex. C ¶ [0025] (emphases added).)

Claim 1 also requires a "movable barrier interface." (Ex. A at 8:9.) Menard's Figure 2 depicts a movable barrier interface as a line connecting the Processor 120 to the GDO. (Madisetti Decl. ¶ 68.) Claim 1 requires the "movable barrier interface" be "operably coupled to the controller." (Ex. A at 8:9-10.) Menard's interface is coupled to its Processor 120, its "controller."[5] (Madisetti Decl. ¶¶ 67-68.)

The next limitation of Claim 1 requires "a wireless status condition data transmitter that is operably coupled to the controller, wherein the wireless status condition data transmitter transmits a status condition signal." (Ex. A at 8:11-14.) Figure 2 of Menard shows Transceiver 130, which is a wireless status condition data transmitter coupled to the controller (i.e., Processor 120 in connection with Programming 150) and transmits a status signal corresponding to the condition of the door. (Ex. C ¶¶ [0021], [0068].) Menard teaches that "Transceiver 130 represents a wireless receiver and transmitter able to communicate using both a long range communication protocol and a short range communication protocol." (*Id.* ¶ [0026]; Madisetti Decl. ¶ 70.)

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[5] In Figure 2, the GDO 10 is pictured outside of the system. But the Menard specification explains that "other embodiments of the system are also contemplated, one of which includes the garage door opener as part of the system." (Ex. C ¶ [0022].)

Under Claim 1, the status condition signal "corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states." (Ex. A at 8:15-17.) Menard likewise teaches that the door position is sent to the user and includes one or a number of positions, such as open, partially closed, or fully closed:

> [T]he user receives notification of the door position information. The door position may be indicated by a pair of lights on a pager (one light labeled "open" and another "close"), by a graphical image on a screen, a recognizable audio tone, a recognizable vibration, or any other means of indicating position to a user.

(Ex. C ¶ [0069].) Menard also teaches responding when "a garage door position sensor indicates that the door is in a raised position and an obstruction in the path of the garage door travel is detected by an optical sensor" by transmitting a "request[] that the obstruction be cleared." (*Id.* ¶ [0025]; Madisetti Decl. ¶¶ 72-74.) Additionally, Menard instructs that "any other information" may be sent to the user's device as well (e.g., the described temperature and obstruction information). (Ex. C ¶ [0066].)

The status condition signal of Claim 1 "comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator." (Ex. A at 8:18-21.) Menard describes using its system to control "several door openers": "In one embodiment, programming 150 allows a user having a cellular telephone in communication with system 100 to control and monitor each of several door openers 10, or other systems coupled to processor 120." (Ex. C ¶ [0071].) To differentiate between door openers, Menard would necessarily have to "substantially uniquely identify" each door. (Madisetti Decl. ¶ 77.)[6]

[6] Menard also anticipates dependent Claim 5 of the '275 Patent, which depends from Claim 1. Claim 5 recites a number of potential operating states for the GDO, including moving the barrier in a first or second direction and detecting the presence of an obstacle. Menard describes that states for the door "include partially, or fully, closing the door" and recognizing when "a [GDO] sensor indicates that the door is in a raised position and an obstruction in the path of the garage

Moreover, in discussing short-range wireless protocals, Menard specifically incorporates by reference the Bluetooth "technical specification version 1.0" ("Bluetooth Specification") (Ex. C ¶ [0041]), which discloses uses an identifier that is unique to the device.[7] (Madisetti Decl. ¶¶ 78-80.) For example, the Bluetooth Specification teaches that "[e]ach Bluetooth transceiver is allocated a unique 48-bit Bluetooth device address (BD_ADDR)." (Ex. K at 143.) The BD_ADDR, "a public address which is unique for each user," is used to maintain security as part of the Bluetooth security protocol. (*Id.* at 149) ("The Bluetooth device address (BD_ADDR) is the 48-bit IEEE address which is unique for each Bluetooth unit."). Since Menard discloses all of the elements of the asserted claims, TTI has raised a substantial question about the validity of the '275 Patent.[8]

3. A Substantial Question About Infringement And Claim Construction Of The '966 Patent Exists

As with the '275 Patent, CGI has not met its burden to show that TTI likely infringes the '966 Patent. A court may deny a preliminary injunction where there are substantial questions about how to construe the claim for purposes of infringement. *See Novo Nordisk A/S v. Sanofi-Aventis U.S. LLC*, 290 F. App'x 334, 336-37 (Fed. Cir. 2008). Dr. Rhyne's testimony raised questions about claim construction and non-infringement. He testified that the issue of whether Claim 9 requires that the Ryobi GDO be sold with a battery "is really more of a legal Markman

door travel is detected." (Ex. C ¶¶ [0025], [0069]; *see also id.* ¶ [0011] ("Other information, such as temperature or light levels, may also be transmitted to the device.")).

[7] *See Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1346 (Fed. Cir. 2009) (material not explicitly contained in a single document may still be considered for purposes of anticipation if incorporated by reference, provided that the document "identif[ies] with particularity what specific material it incorporates and clearly indicate where that material is found").

[8] The attached declaration of Dr. Madisetti contains additional grounds that raise substantial questions of invalidity. (Madisetti Decl. ¶¶ 84-120.) For example, Dr. Madisetti describes U.S. Patent No. 6,392,537 ("Tazumi"), published on May 21, 2002, that discloses virtually all of the limitations of Claims 1 and 5. (*Id.* ¶¶ 84-101.) The only element arguably missing from Tazumi is wireless transmissions, but the '275 Patent admits that wireless transmitters were well known in the art. (Ex. A at 3:54 – 4:4.)

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used in forming the opinions set forth herein. I have used my understanding of these legal principles, as set forth in this section, to analyze the ’275 and the ’966 patents.

A. Invalidity

19. As explained to me, a determination of patent validity involves a two-step process. First, the claim language must be construed by the Court to determine its scope and meaning. In that regard, I understand that statements made about certain claim terms during the prosecution history of a patent in the same family as the patent-in-suit can have an effect on the interpretation of the same terms used in the patent-in-suit. Second, the construed claim language must be compared with the prior art to determine whether the claim is valid.

20. I have been informed by counsel that my analysis of each patent claim must utilize the construction, as provided by the Court, of every included claim term. As discussed further below, I understand that claim terms have not yet been construed by the Court’s, so I have applied the plain and ordinary meaning of the claims in the light of the experience of one of ordinary skill in this area of technology. In addition, I also provide an opinion taking into consideration the Plaintiff’s apparent interpretation of the claims as well.

i. Anticipation

21. I understand that a patent claim is invalid if the claimed invention is anticipated. For a claimed invention to be invalid because of anticipation, all of the elements of the claims must be found in a single prior art reference.

22. I understand that to establish anticipation, a prior art reference must disclose every element of the patent claim at issue, either explicitly or inherently. In addition, the anticipating reference must enable one skilled in the art to make and use the invention without undue experimentation.

a transceiver 130 that is “a wireless receiver and transmitter able to communicate using both a long range communication protocol and a short range communication protocol,” such as cellular telephone protocol and Bluetooth, respectively. Ex. C, ¶ [0026].

59. Menard describes that “programming 150 allows a user having a cellular telephone in communication with system 100 to control and monitor each of several door openers 10, or other systems coupled to processor 120.” *Id.*, ¶ [0072].

60. The below passages are merely exemplary of the Menard’s teachings that disclose each of the elements of claims 1 and 5. In my opinion, a POSITA reading Menard as a whole would find Menard to disclose all of the claims’ limitations.

ii. Claim 1, Preamble & Element 1[a]

“A movable barrier operator comprising: a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;”

61. In my opinion, Menard discloses all of the limitations of the preamble and first element of claim 1 of the ’275 patent, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

62. As previously discussed, the ’275 describes that the “controller 11 will preferably comprise a programmable platform (such as, for example, a ***microprocessor***, a microcontroller, a programmable logic or gate array, or the like) . . . as is generally well understood in the art.” Ex. A, 3:30-36 (emphasis added).

63. Menard describes a similar microprocessor for controlling a movable barrier operator: “Processor 120 may include a ***microprocessor*** as well as memory to perform the programmed functions and to retain settings and configuration information. Processor 120 may

also include a driver circuit to ***provide an electrical signal at a level sufficient to operate the garage door opener***." Ex. C, ¶ [0023].

64. Additionally, Menard describes that the processor (or controller) has a plurality of potential operating conditions defined, at least in part, by a plurality of operating states:

> "Among the programming functions in one embodiment are instructions for causing processor 120 to actuate a particular control upon receiving a predetermined signal. For example, if a garage door position sensor indicates that the door is in a raised position and an obstruction in the path of the garage door travel is detected by an optical sensor, then a signal received by the processor requesting the door to be closed is met with programming requesting that the obstruction be cleared before the door will travel."

Id., ¶ [0025]; *see also id.*, ¶ [0030] ("[S]ensor 155 includes a first magnetic switch to detect door 40 in an open position and second magnetic switch to detect door 40 in a closed position. . . . Sensor 155 provides an electrical signal corresponding to the position of door 40. The input to sensor 155 may be derived from door 40, trolley 25, or other member that provides reliable information relative to the position of door 40."

65. Menard describes that the controller reads and responds to a number of additional sensors using auxiliary sensors programming 260, including position, temperature, optical, and also recognizes that "[o]ther sensors, and appropriate programming, are also contemplated." *Id.*, ¶ [0061].

iii. Claim 1, Element 1[b]

"a movable barrier interface that is operably coupled to the controller;"

66. Menard discloses each limitation of claim 1's second element, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

67. The '275 patent describes that "the movable barrier interface 12 serves to selectively impart motion to the movable barrier 13 to cause the movable barrier 13 to move to a desired position (such as, for example, a fully opened or a fully closed position) . . . ." Ex. A, 3:41-45. Thus, the interface is described as being components that connect the microprocessor to the physical components that impart motion to the garage door or otherwise control the garage door opener.

68. Menard likewise describes "Processor 120 is also coupled to elements labeled power 125 and transceiver 130." Ex. C, ¶ [0021]. As shown above, Menard's Figure 2 depicts a movable barrier interface as a line connecting the processor 120 to the GDO 10. *Id.*, Fig. 2. Menard describes that the microprocessor may use programming to actuate a number of sensors associated with imparting motion to the garage door or otherwise control the garage door opener:

> "Door programming may include position sensor programming 220 and actuator programming 225. Position sensor programming 220 may include software routines and modules that receive and interpret position information derived from a door position sensor as part of door opener 10. Actuator programming may include door open programming 230 and door close programming 235. Door open programming 230 may include software routines and modules that raise door 40 in response to commands received by processor 120. Door close programming

235 may include software routines and modules that lowers door 40 in response to commands received by processor 120.

Id., ¶ [0061].

iv. Claim 1, Element 1[c]

"a wireless status condition data transmitter that is operably coupled to the controller"

69. Menard discloses each limitation of claim 1's third element, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

70. Figure 2 of Menard depicts transceiver 130 as coupled to the processor 120 (i.e., controller), and Menard's specification confirms "Processor 120 is also coupled to elements labeled power 125 and transceiver 130." *Id.*, ¶ [0021]; *see also id.*, ¶ [0026] ("Transceiver 130 represents a wireless receiver and transmitter able to communicate using both a long range communication protocol and a short range communication protocol.").

v. Claim 1, Element 1[d]

"wherein the wireless status condition data transmitter transmits a status condition signal that: corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states;"

71. Menard discloses each limitation of claim 1's fourth element, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

72. Menard describes that "[t]ransceiver 130 represents a wireless receiver and transmitter able to communicate using both a long range communication protocol and a short range communication protocol." *Id.*, ¶ [0026]. Menard discloses that the transmission uses Bluetooth or cellular telephone. *Id.*, ¶ [0031] ("[T]ransceiver 130A is shown having

compatibility with both a cellular telephone protocol 135A and a BLUETOOTH® protocol 140A.").

73. Menard further describes a method for the transmitter to send, and for a user to receive, "door position information and for controlling the door from a remote location." *Id.*, ¶ [0068]; *see also id.*, ¶ [0030] ("Sensor 155 provides an electrical signal corresponding to the position of door 40. The input to sensor 155 may be derived from door 40, trolley 25, or other member that provides reliable information relative to the position of door 40.").

74. Menard describes:

> the user receives notification of the door position information. The door position may be indicated by a pair of lights on a pager (one light labeled "open" and another "close"), by a graphical image on a screen, a recognizable audio tone, a recognizable vibration, or any other means of indicating position to a user. At 375, the user is presented with one or more options to control system 100. In the case that door 40 is open, options may include partially, or fully, closing the door. A single option may be presented that allows the user to toggle the position of the door between a closed and an open position. The option may be a button or several buttons.

Ex. C, ¶ [0069]. Menard further describes that "For example, if a garage door position sensor indicates that the door is in a raised position and an obstruction in the path of the garage door travel is detected by an optical sensor, then a signal received by the processor requesting the door to be closed is met with programming requesting that the obstruction be cleared before the door will travel." *Id.*, ¶ [0025].

75. Moreover, Menard describes that the "[p]rogramming 150 may include instructions to cause processor 120 to transmit position information, ***or any other information***, using all modes of communication." *Id.*, ¶ [0066]. Menard also discloses that "[o]ther

information, such as temperature or light levels, may also be transmitted to the device." *Id.*, ¶ [0011].

vi. Claim 1, Element 1[e]

"[wherein the wireless status condition data transmitter transmits a status condition signal that:] comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator."

76. Menard discloses each limitation of claim 1's fifth element, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

77. Menard discloses that "[i]n one embodiment, programming 150 allows a user having a cellular telephone in communication with system 100 ***to control and monitor each of several door openers 10*** . . . ." Ex. C, ¶ [0071]. In order to control and monitor several door openers, Menard would need to use an identifier that is at least relatively unique to each movable barrier operator, such that the status condition signal substantially uniquely identifies the respective movable barrier operator.

78. Moreover, Menard discloses that its transmissions utilize either short range or long range communication protocols, and that the "range communication protocol may include, but is not limited to, wireless protocols such as BLUETOOTH®, HomeRF™, wireless LAN (WLAN) or other personal wireless networking technology." Ex. C, ¶ [0040]. Menard also explicitly incorporates the Bluetooth specifications by reference. *Id.* at ¶ [0041] ("In one embodiment, the present system includes a transceiver in compliance with BLUETOOTH® technical specification version 1.0, herein incorporated by reference."). The BLUETOOTH® technical specification version 1.0 is attached hereto as Exhibit K.

79. A POSITA would understand that Bluetooth utilizes an identifier that is at least relatively unique to the device transmitting the signal, such that the signal substantially uniquely identifies the transmitting device. Bluetooth's technical specification version 1.0 ("Bluetooth specification") confirms that it uses an identifier that is at least relatively unique to the device. For example, the Bluetooth specification confirms that "Each Bluetooth transceiver is allocated a unique 48-bit Bluetooth device address (BD_ADDR)." Ex. K, at 143; *see also id.* at 149 ("The Bluetooth device address (BD_ADDR) is the 48-bit IEEE address which is unique for each Bluetooth unit.").

80. I note that Chamberlain's expert, Dr. Rhyne, relied on a media access control ("MAC") address as allegedly teaching this feature. Rhyne Declaration, at 42-46. A MAC address is a physical address of a particular device that is often assigned by the manufacturer of device. When using certain communication protocols, MAC address are sometimes sent with a signal to identify which device the signal came from. The Bluetooth device address (BD_ADDR) that I discuss above is the equivalent of a MAC address for Bluetooth enabled devices.

vii. Claim 5

81. Claim 5 depends from claim 1 and recites that the "operating states" from claim 1 include at least one of "moving a movable barrier in a first direction; moving the movable barrier in a second direction; reversing movement of the movable barrier; halting movement of the movable barrier; detecting a likely presence of an obstacle to movement of the movable barrier; detecting a likely proximal presence of a human; receiving a wireless remote control signal; receiving a wireline remote control signal; receiving a learning mode initiation signal; a lighting status change; a vacation mode status change; detecting a likely proximal presence of a vehicle;

detecting the identification of a proximal vehicle; and receiving an operating parameter alteration signal."

82. As discussed in connection with element 1[d] Menard describes that the "[p]rogramming 150 may include instructions to cause processor 120 to transmit ***position information, or any other information***, using all modes of communication," Ex. C, ¶ [0066], as well as "[o]ther information, such as ***temperature*** or ***light levels***, may also be transmitted to the device." *Id.*, ¶ [0011]. Thus, Menard teaches all of the elements claim 5 as well when those elements are viewed both individually and in conjunction with the elements of claim 1.

* * * *

83. In view of the above discussion, in my opinion, a POSITA would have found claims 1 and 5, viewing the alleged inventions as a whole, to be anticipated, or at the very least, obvious in view of Menard.

C. Claims 1 and 5 Are Also Obvious In Over U.S. Patent 6,392,537

i. Overview of Tazumi

84. U.S. Patent No. 6,392,537 ("Tazumi"; attached hereto as Exhibit D) published on May 21, 2002 and discloses a system for monitoring automatic door systems from a remote location. Ex. D, 1:52-56. Tazumi discloses that "[e]ach door system has ***a control unit*** which includes a controller and self-diagnosing means." *Id.* at 1:63-65 (emphasis added). Figure 2 (shown below with coloring added) depicts a block diagram of the control unit included on each door in Tazumi's system:

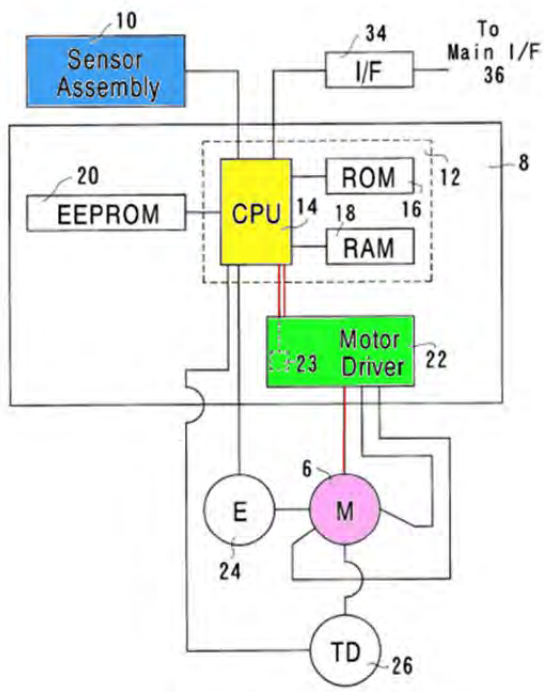

FIG. 2

85. As can be seen with reference to Figure 2, each door has a sensor assembly 10 (blue) for "sensing an object, e.g. a human, in an area near the door system," *id.* at 5:60-63, a control unit 8 containing a CPU 14 (yellow) that operates the system and controls the door, and a motor driver 22 (green) that connects the CPU to the motor 6 (pink).

ii. Claim 1, Preamble & Element 1[a]

"A movable barrier operator comprising: a controller having a plurality of potential operational status conditions defined, at least in part, by a plurality of operating states;"

86. Tazumi discloses all of the limitations of the preamble and first element of claim 1 of the '275 patent, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

87. Tazumi discloses a system for monitoring automatic door systems from a remote location. Ex. D, 1:52-56. Tazumi discloses that "[e]ach door system has a control unit which

> a similar fashion, the transmission power, modulation type, signaling protocol, and other attendant characterizing features and practices of the wireless transmitter 15 can again be as desired to suit the needs of a particular setting. . . . Again, ***such transmitters are well understood in the art and hence further elaboration here will not be provided***.

Ex. A, 3:54 – 4:4 (emphases added).

94. Additionally, Menard (discussed above) and Weik (discussed below) disclose wireless transmitters for long-range communications via cellular phone and Internet connection, and Menard, Heitschel, and Williams (discussed below) disclose short range communications, such as RF. Depending on the location of the maintenance facility, a POSITA would have found it obvious to modify Tazumi to use either short or long range communications in view of these prior art disclosures as well.

v. Claim 1, Element 1[d]

"wherein the wireless status condition data transmitter transmits a status condition signal that: corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states;"

95. Tazumi discloses each limitation of claim 1's fourth element, shown above, when those elements are viewed both individually and in conjunction with the other elements of claim 1.

96. Tazumi describes transmitting a status condition signal:

> "When any one of the door systems fails, the self-diagnosing means of that door system sends to the maintenance station, through a communications system, failure information including door system part identifying information indicating a malfunctioning or broken part of that door system (hereinafter referred to simply as door system part identifying information). Also, the failure information includes door system identifying information identifying the door system to which each self-diagnosing means belongs."

Ex. D, 2:2-11.

97. Tazumi describes that the status condition signal corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states:

> "The state code contains information about the operating state of the automatic door when the detected failure occurs. The information can be used at the maintenance station 30 to determine how to service the door. For example, it can be used to determine whether or not the malfunctioning part should be replaced by a new one. Particularly, the state information includes information of the position of the door where it has stopped, values of various operating parameters, maintenance information about the maintenance which has been provided for the automatic door, etc."

Id. at 9:6-16; *see also id.* at 2:31-39 ("The door operation information is such information that the maintenance man can determine how the door system should be repaired, by studying the information together with the above-described door system part and door system identifying information. For example, the door operation information may be information about the door position where the door has stopped, parameter information about a door operation parameter, such as a door opening speed and a door closing speed, and maintenance information."); *id.* at 6:20-24 ("A temperature detector (TD) 26 detects the temperature of the motor 6 and generates an overheat signal when the temperature of the motor 6 exceeds a predetermined temperature.").

Claim 1, Element 1[e]

"[wherein the wireless status condition data transmitter transmits a status condition signal that:] comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator."

98. Tazumi discloses each limitation of claim 1's fifth element, shown above, when those elements are viewed both individually and in conjunction with the other elements of

claim 1.

99. Tazumi also describes that transmitted signal includes an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator:

> "When the connection is completed, transmission of data or failure information starts (Step S4c). The failure information to be transmitted contains an ID code, a failure code and a state code, as shown in FIG. 5. The ID code is a code assigned to each of the door systems 2a, 2b and 2c to individually identify the door systems. The maintenance station 30 can determine the malfunctioning automatic door system from the received ID code."

Id. at 9:6-16

vi. Claim 5

100. Claim 5 depends from claim 1 and recites that the "operating states" from claim 1 include at least one of "moving a movable barrier in a first direction; moving the movable barrier in a second direction; reversing movement of the movable barrier; halting movement of the movable barrier; detecting a likely presence of an obstacle to movement of the movable barrier; detecting a likely proximal presence of a human; receiving a wireless remote control signal; receiving a wireline remote control signal; receiving a learning mode initiation signal; a lighting status change; a vacation mode status change; detecting a likely proximal presence of a vehicle; detecting the identification of a proximal vehicle; and receiving an operating parameter alteration signal."

101. As discussed in connection with element 1[d], Tazumi describes that "the state information includes information of the position of the door where it has stopped, values of

various operating parameters, maintenance information about the maintenance which has been provided for the automatic door, etc." *Id.* at 9:6-16. Tazumi also describes "The automatic door system 2a also has an assembly of sensors 10 for sensing an object, e.g. a human, in an area near the door system 2a. In the normal state, the door is closed, i.e. it is in the fully closed position." *Id.* at 5:60-63. Thus, Tazumi teaches all of the elements claim 5 as well when those elements are viewed both individually and in conjunction with the elements of claim 1.

* * * *

102. In view of the above discussion, in my opinion, a POSITA would have found claims 1 and 5, viewing the alleged inventions as a whole, to be obvious over Tazumi alone and/or in combination any of Menard, Williams, Heitschel, or Weik.

D. Claims 1 and 5 Are Obvious Over Tazumi and/or Menard In View Of Additional Prior Art

103. As discussed above, in my opinion, the ’275 patent recognizes that many of the elements of claims 1 and 5 were well understood in the art at the time of the ’275 patent’s filing, and Menard discloses each element in claims 1 and 5 of the ’275 patent.

104. In addition to the admissions in the specification of the ’275 patent and the disclosure of the Menard and Tazumi references discussed above, there are a number of additional prior art references that could be combined with the Menard reference to further teach that certain elements of claims 1 and 5 were well understood in the art at the time of the ’275 patent’s filing. Each of the references I discuss below are in or directly apply to the same field of art as the ’275 patent and utilize similar technology for using wireless transmissions to send digital data. A POSITA would have found it obvious to combine references with Menard and Tazumi with little to no experimentation and in a way that would lead to predictable results based on the level of ordinary skill in the art at the time of the ’275 patent’s filing.

i. U.S. Patent No. 5,109,213

105. U.S. Patent No. 5,109,213 ("Williams"; attached hereto as Exhibit E) published on April 28, 1992 and discloses a wireless transmission system that transmits a signal including status information and a unique identifier. In particular, Williams is directed to a tire pressure monitoring system for sensing high and low tire air pressure and communicating the tire status information to an operator of a vehicle. Ex. E, Abstract. Although Williams describes a tire pressure monitor system, Williams describes that:

> Additionally, the primary electronics and electrical circuits which may be advantageously utilized in the present invention are known and readily available. This being ***particularly evident in the electric-powered garage door*** and wireless security monitor industries where digital electrical circuitry to essentially eliminate false signals has been developed and put into wide use with excellent results.

Ex. E, 2:66 – 3:5 (emphasis added).

106. Williams discloses a wireless transmitter 14 provided as part of wheel attachable unit 01, such as depicted in Figure 1, shown below. *Id.* at 3:38-41.

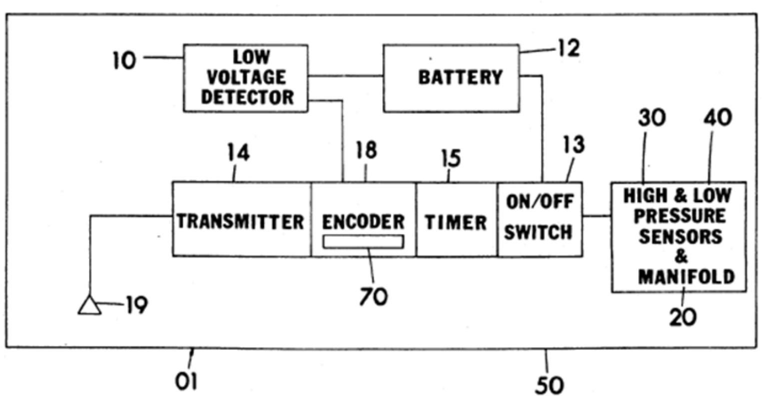

FIG. 1

107. The transmitter receives pressure signals from manifold 20 and digitally encodes it using encoder 18. *Id.* at 7:6-11. The digitally encoded information is then sent to a receiver 61

via radio frequency ("RF") transmission from antenna 19. *Id.* at 6:32-35. Williams discloses that the transmission signal is encoded with source identification bits 72, which is sent with the encoded pressure signal, in order allow the vehicle attachable unit 60 to "identify by comparison, the transmitting wheel attached unit 01 as being on the same vehicle." *Id.* at 11:10-24. Williams also describes that the transmission signal is encoded with high or low pressure bits, and that the "high or low pressure 73 status segment generates the 0's and 1's in an order and number ***representing either a high or low pressure status of the tire 102*** responsible for triggering the activated pressure sensor 30 or 40." *Id.* at 10:48-53 (emphasis added). Figure 10 of Williams shows the construction of its transmission signal:

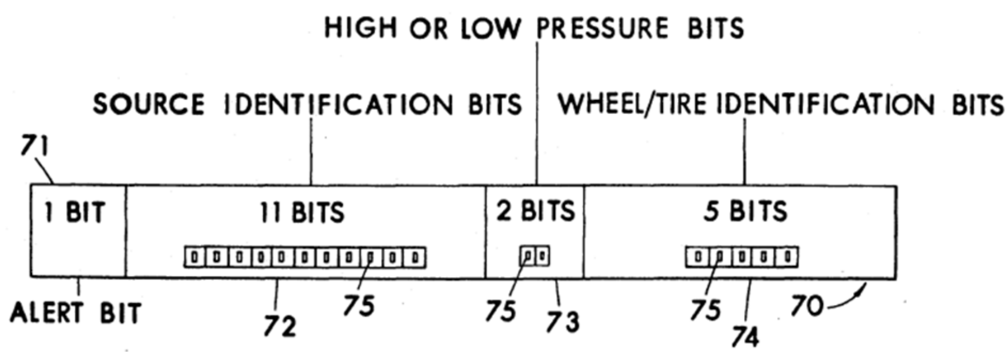

FIG. 10

108. Williams demonstrates that it was well known in the art at least as early as 1991 that systems for transmitting wireless signals could encode and transmit signals including status information and unique identifiers for identifying the device that transmitted the signal, in this case the transmitter located on a particular wheel. The identification signal disclosed by Williams is "relatively unique" to and "substantially unique identifies" the transmitting device.

109. A POSITA would have found it obvious to combine the teachings of Williams regarding sending wireless transmission signals containing both status information and unique identifiers with Menard's of utilizing similar wireless technology in connection with movable

barrier operators, or with Tazumi's disclosure of transmitting fault signals to a remote location. I note that Williams itself provides an explicit motivation to combine by recognizing that its tire pressure monitor systems utilizes the same electronics and electrical circuits as "electric-powered garage door and wireless security monitor industries." Ex. E, 2:66 – 3:5.

110. In my opinion, claims 1 and 5 of the '275 Paten would also be obvious over Menard and/or Tazumi in view of Williams's discussion of transmitting a status condition signal that corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states, and that comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the transmitting device.

ii. U.S. Patent No. 4,750,118

111. U.S. Patent No. 4,750,118 ("Heitschel"; attached hereto as Exhibit F) was published on June 7, 1988 and discloses a coding system for allowing a garage door opener system to recognize signals received from multiple transmitters. Heitschel describes that "[i]t is an object of the present invention to provide a plurality of transmitters wherein ***each transmitter has its own unique and permanent non-user changeable code*** and wherein the receiver can be placed into a program mode wherein it will receive and store two or more codes corresponding to two different transmitters." Ex. F, 1:33-39. Heitschel further describes that "each transmitter encoder will contain a chip which contains a unique code and the receiver will be able to memorize two or more as, for example, five different transmitter codes." *Id.* at 1:63-66.

112. A POSITA would under these passages of Heitschel to demonstrate that it was well understood in the art over a decade before the filing of the '275 patent for transmitter chips to have a unique and permanent code that is encoded during and sent during transmissions as an

identification signal, such that the identification signal is "relatively unique" to and "substantially unique identifies" the transmitter.

113. Heitschel, Tazumi, and Menard are directed to barrier operator systems, and are in the same field of art as the '275 patent. A POSITA would have found it obvious to combine the teachings of Heitschel regarding sending wireless transmission signals containing unique identifiers with Menard's disclosure of utilizing similar technology in a garage door opener or with Tazumi's disclosure of transmitting fault signals to a remote location.

114. In my opinion, claims 1 and 5 of the '275 Paten would also be obvious over Menard and/or Tazumi in view of Heitschel further discussion of a status condition signal that comprises an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the movable barrier operator.

iii. U.S. Patent App. Pub. No. 2002/0170685

115. U.S. Patent Application Publication No. US 2002/0170685 ("Weik II"; attached hereto as Exhibit G) published on Nov 21, 2002 and discloses a control system that for operating one or more movable barriers (e.g., in a large parking lot). Ex. G, Abstract. Weik II describes providing control signals to various accessories of its movable barriers, and logging events, such as accidents, that the barrier has moved in a given direction, and the speed of the barrier. *Id.* Weik II also describes transmitting these logs to a central facility that may in turn remotely change the operating parameters of the control system. *Id.*

116. Figure 5 of Weik II illustrates a block diagram of the various components of the control system for the movable barrier operator:

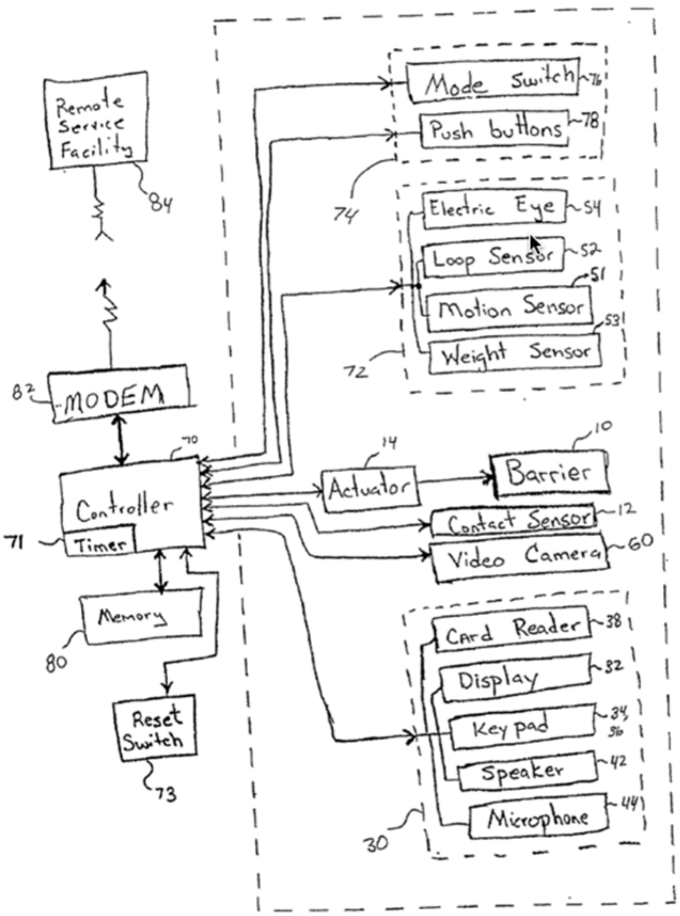

FIG. 5

117. Weik II describes that customer terminals are connected to a controller 70 (shown in Figure 5 above by) either wireless or wired connections. Weik II also describes that the controller is connected to "[o]ne or more vehicle detectors 72 (such as the electric eye system 54, the loop sensor 52, a motion sensor 51, and/or a weight sensor 53)," as well as a contact sensor 12 and a video camera 60. Ex. G, ¶ 60. The controller 70 is connected a "remote service facility 84, via a cellular phone connection, Internet connection, etc.," *id.* at ¶ 104, and transmits various information to the remote facility when the sensors are triggered. Weik II also discloses that "Memory 80 and timer 71 are an integral part of the controller 70. The memory 80 stores events,

alarms and warnings as they occur, complete with a time stamp. The events, warnings and alarms can be sent, via the modem 82, to the remote service facility 84." *Id.* at ¶ 59.

118. Weik II, Tazumi, and Menard are directed to barrier operator systems, and are in the same field of art as the '275 patent. A POSITA would have found it obvious to combine the teachings of Weik II regarding sending wireless transmission signals to a remote facility with Menard's disclosure of utilizing similar technology in a garage door opener or with Tazumi's disclosure of transmitting fault signals to a remote location.

119. A POSITA would understand these passages of Weik II to disclose transmitting a status condition signal that corresponds to a present operational status condition defined, at least in part, by at least two operating states from the plurality of operating states, including, for example, status and time. Additionally, the transmission of a camera image serves a similar purpose as an identifier that is at least relatively unique to the movable barrier operator, such that the status condition signal substantially uniquely identifies the transmitting device. I note that Weik II's claims also contain limitations that show that the remote facility is capable of monitoring and distinguishing between different parking areas and transmitters. For example, Claims 42-44, specifically disclose a third modem at a remote service facility, which is distinguished between a first and second transmitting modems at first and second controllers to the remote facility. In my opinion, this further confirms to a POSITA that the transmissions are sent with an identifier to allow the identification of the respective parking area.

120. In my opinion, claims 1 and 5 of the '275 Patent would also be obvious over Menard and/or Tazumi in view of Weik II.