In The
United States Court of Appeals
For The Federal Circuit

IN RE: C. DOUGLASS THOMAS,

Appellant.

APPEAL FROM THE UNITED STATES PATENT AND TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD, IN CASE NO. 13/099,285, CHARLES J. BOUDREAU, ADAM J. PYONIN, MAHSHID D. SAADAT, ADMINISTRATIVE PATENT JUDGES.

BRIEF OF APPELLANT

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Dated March 6, 2017

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

In re Thomas **v.** _____

Case No. 2017-1149

CERTIFICATE OF INTEREST

Counsel for the:
☐ (petitioner) ☒ (appellant) ☐ (respondent) ☐ (appellee) ☐ (amicus) ☐ (name of party)

C. Douglass Thomas

certifies the following (use "None" if applicable; use extra sheets if necessary):

1. Full Name of Party Represented by me	2. Name of Real Party in interest (Please only include any real party in interest NOT identified in Question 3) represented by me is:	3. Parent corporations and publicly held companies that own 10 % or more of stock in the party
C. Douglass Thomas	IpVenture, Inc.	none

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court (**and who have not or will not enter an appearance in this case**) are:

Mar 6, 2017
Date

/s/ C. Douglass Thomas
Signature of counsel

Please Note: All questions must be answered

C. Douglass Thomas
Printed name of counsel

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STATEMENT OF RELATED CASES

Appellant states, pursuant to Fed. Cir. R. 47.5, that (a) no appeal in or from the same proceeding was previously before this or any other appellate court; and (b) no case is known that will directly affect or will be directly affected by this Court's decision in the pending appeal. There were, however, prior appeals to this court on related patents in appeals nos. 13-1142 (including 13-1143, -1144) and 2015-1575 (including 2015-1577, -1578, 1579).

JURISDICTIONAL STATEMENT

The court has jurisdiction pursuant to 28 U.S.C. § 1285(a)(4)(A) as being an appeal under 35 U.S.C. §§ 141 and 142 from a Final Written Decision issued on June 1, 2016, by the Patent Trial and Appeals Board ("Board") of the U.S. Patent and Trademark Office. A Notice of Appeal was timely filed by IpVenture on November 2, 2016, following the Board's Decision on Rehearing on October 3, 2016.

STATEMENT OF THE ISSUES

This appeal presents several issues related to the Board's incorrect determination of unpatentability of claims of U.S. Patent Application No. 13/099,285 (" '285 Application"), including:

1. Whether the Board erred factually and as a matter of law in its unreasonably broad construction of "a temperature measurement of the microprocessor from the internal temperature sensor" and in doing so fatally tainted its unpatentability findings as to all claims of the '285 Application.
2. Whether the Board erred factually and as a matter of law in its failing to fully consider limitations of the claims, yet affirming the Examiner's finding of unpatentability of all claims of the '285 Application.

STATEMENT OF THE CASE

This appeal arises from an adjudication by the Patent Trial and Appeal Board ("Board") of whether or not the Examiner properly rejected all claims of the '285 Application. Appellant, IpVenture, Inc., is the assignee of the '285 Application.

Procedural History

The '285 Application (Appx18-52) was filed with the United States Patent and Trademark Office ("USPTO") on May 2, 2011. An amendment (Appx18-76) was filed on December 12, 2012, to cancel claims 1-3 and add claims 4-19 to the application. Claim 4-19 were finally rejected in a final Office Action dated on January 24, 2013. Appx77-89. The final rejection of claims 4-19 was appealed to the Board on June 19, 2013. Appx103. On August 14, 2013, a first Appeal Brief was filed. Appx110-208. Thereafter, in an Office Action dated September 17, 2013, the Examiner took the unusual action of re-opening prosecution. Appx209-225. On January 17, 2014, Appellant elected to maintain its appeal and thus filed a Notice of Appeal to the Board. Appx226-227. Appellant filed a second Appeal Brief on January 24, 2014. Appx229-260. The Examiner, on April 28, 2014, filed its Examiner's Answer. Appx262-290. Appellant then filed its Reply Brief to the Examiner's Answer on May 30, 2014. Appx291-311.

On April 6, 2016, an oral hearing was held. Appx321-335. The Board issued its Final Written Decision ("Board's Decision") on June 1, 2016. Appx1-9. In its decision, the Board found claims 4-19 to be unpatentable as obvious. IpVenture filed a request for rehearing on August 1, 2016. Appx336-344. The Board issued a decision denying the rehearing request on October 3, 2016. Appx10-14. Appellant filed a Notice of Appeal to this court on November 2, 2016, to appeal the Board's Decision. Appx345-361.

STATEMENT OF FACTS

I. THE THOMAS PATENT

C. Douglass Thomas and his father Alan E. Thomas (hereafter "Thomas"), as inventors, filed the '285 Application to seek a patent on innovations concerning power and/or thermal management of computers. The '285 Application claims priority to an original Thomas patent application filed in June 1994.

In the early 1990s, when Thomas conceived of the invention claimed in the '285 Application, the computer industry focused on delivering computers with processors (*e.g.*, CPUs) operating at ever-higher processor speeds. But as computer processors got faster and smaller, they ran hotter, resulting in an ever increasing need to prevent the processors from overheating while maintaining performance. If a processor overheated, its computer would shut down, not function as intended, or suffer damage. Slowing down the frequency at which a processor operates (referred to as "throttling") reduces both power consumption and heat, but by itself hinders performance. Speeding up a fan could increase cooling of the processor, but also would increase power consumption and noise.

The Thomas' '285 Application concerns thermal and/or power management for computers. The Thomas '285 Application addresses the overheating problems by providing advanced techniques for managing thermal conditions. Various approaches described in the Thomas' '285 Application facilitate intelligent control

of a processor's clock frequency and/or a fan's speed so as to provide thermal and/or power management for the computer. For example, in certain embodiments, Thomas teaches that thermal management can involve lowering the processor's clock frequency when the processor's temperature reaches certain thresholds and activating a fan (or increasing its speed) at other thresholds, and to use these concepts together in a coordinated manner.[1] Thomas teaches that the thermal management can be provided differently depending on whether operating in a first operational mode or in a second operational mode. In other certain embodiments, which pertain to a computer system including a microprocessor, one or more temperature sensors, a variable speed fan, and a power management module, the power management module can operate dependent on a first or second operational mode and can be based on the temperature of the processor. The system can also control the operational speed of the fan based on the operational mode in use. Regardless of the embodiment, these advanced techniques "facilitate intelligent control of a processor's clock frequency and/or a fan's speed so as to provide thermal and/or power management for the computing device."[2] The intelligent and efficient control of the microprocessor and fan can prevent overheating of the microprocessor while maximizing microprocessor performance.

[1] *E.g.*, Thomas '285 Application, ¶[0004] (Appx23); ¶[0032] (Appx29); ¶[0039] (Appx31); ¶[0040] (Appx32); ¶[0050]-[0056] (Appx35-38).

[2] Thomas '285 Application, Abstract. (Appx44)

This is especially useful in portable computers because energy conservation is an important factor for such computers.[3]

II. THE EXAMINER'S REJECTION

The Examiner rejected claims 4-8 and 11-19 under 35 U.S.C. § 103(a) as being unpatentable over Pippin, U.S. Patent 7,216,064, in view of Ikedea, U.S. Patent No. 5,664,201, and further in view of Swamy, U.S. Patent 5,623,594. Appx214-223. The Examiner also rejected claims 9-10 under 35 U.S.C. § 103(a) as being unpatentable over Pippin in view of Ikedea and Swamy and further in view of Gunn et al., U.S. Patent 5,436,827. Appx223-224. Appellant herein disputes the Examiner's rejections and the Board's affirmance thereof.

III. THE PIPPIN PRIOR ART

Pippin (Appx387-410) describes a programmable thermal sensor implemented in a microprocessor. The thermal sensing is provided by a bandgap voltage (Vbe) internal to the microprocessor. *E.g.*, Pippin, col. 5, lines 64-67 (Appx403); col. 6, lines 38-44 (Appx403); Figs. 1, 4 and 5 (Appx390, Appx393, Appx394). Also internal to the microprocessor are a voltage reference 120, a comparator (sense amplifier) 160, and a microprogram 740. *See*, Figs. 1 and 7 (Appx390, Appx396). The comparator 160 compares the bandgap voltage (Vbe), i.e., the temperature measurement, with the voltage reference to produce an

[3] *E.g.*, Thomas '285 Application, ¶[0013]-[0016] (Appx24-25); ¶[0032]-[0033] (Appx29); ¶[0054]-[0056] (Appx37).

interrupt signal. Pippin, col. 11, lines 4-9 (Appx406). The interrupt signal is supplied to the microprogram 740 and a processor unit 705 within the microprocessor. *See*, Fig. 7 (Appx396). In an alternative embodiment, the interrupt signal can also be made available to external circuitry 940. *See*, Fig. 9 (Appx398).

IV. THE IKEDEA PRIOR ART

Ikedea (Appx369-378) describes a drive control system for a microprocessor (CPU). The system includes a switching circuit 5 that can adapt the clock speed of the microprocessor (CPU) 2. The clock speed can be switched between high speed and low speed based on a temperature sensor 10 provided in the vicinity of the microprocessor (CPU) 2. *See*, Fig. 1 (Appx380).

V. THE SWAMY PRIOR ART [U.S. Patent No. 5,623,594]

Swamy (Appx369-378) describes a system and method for monitoring the temperature of a heat-producing electronic component located on a circuit board. The system uses "(1) an electrically-conductive trace of predetermined dimensions formed integrally with the circuit board, the trace having a temperature-dependent electrical property, a temperature of the electronic component affecting the electrical property and (2) an overtemperature detection circuit coupled to the trace for measuring the electrical property." Swamy, abstract (Appx369). Figure 2 of Swamy indicates that an over temp circuit 210 can be used to control a fan 240 if

the temperature being computed is at an excessive level. Appx371. Additionally, at column 7, lines 34-37, Swamy states: "Alternatively, the signal may send a message to the user through the video subsystem 280, or it may instruct the CPU clock 250 to decrease the operational speed of the CPU 260." (Appx376) This is described as an alternative to instructing the fan 240 to turn on or to increase its speed. Swamy, column 7, lines 29-33 (Appx376).

VI. THE GUNN ET AL. [U.S. Patent No. 5,436,827]

Gunn et al. (Appx362-368) is generally concerned with a replaceable fan for electronic equipment but is not germane to this appeal because it was applied to only limitations of claims 9-10 which are not at issue herein.

SUMMARY OF THE ARGUMENT

The Board's Decision and findings of unpatentability of all claims of the '285 Application contain numerous legal and factual errors that stem from the Board's failure to adequately perform its appellate review.

As for claim 4, the Board relied on excessively broad claim construction to support its desired conclusion of unpatentability. Claim 4 pertains to a method for thermally managing temperature of a computing apparatus having a microprocessor that includes an internal temperature sensor. The computing apparatus also includes circuitry external to the microprocessor for thermal management. Among other things, claim 4 precisely specifies that a temperature measurement is acquired from the temperature sensor internal to the microprocessor. Also, claim 4 details that such temperature measurement must be received at the circuitry external to the microprocessor.

Yet, in forcing its desired outcome, the Board ignored the claim language of claim 4 and instead relied on fabricated and conclusory assertions of unpatentability. For instance, the Board unreasonably broadened its claim construction such that the "temperature measurement" limitation covers any indication of temperature without any need for a measurement from an internal temperature sensor whatsoever.

With this distorted claim construction, the Board's principally relied on Pippin's interrupt signal as an indication of temperature and thus a temperature measurement. Not only is Pippin's interrupt signal not a measurement of temperature, but an interrupt signal is not a signal of any kind from an internal temperature sensor. Instead, in Pippin, the only temperature measurement is from a bandgap voltage *(i.e.*, the programmable Vbe 110) and that temperature measurement is intentionally never made external to the integrated circuit in Pippin. *See* Pippin, Fig. 1 (Appx390). Thus, Pippin fails to teach or suggest any ability or desire to provide a temperature measurement (of a microprocessor from an internal temperature sensor) to "circuitry external to the microprocessor" as recited in claim 4. As an alternative position, the Board appeared to assert that Ikedea also teaches the claimed temperature measurement. This too is erroneous as *Ikedea* has no temperature sensor internal to a microprocessor and thus no ability to satisfy claim 4.

The Board thus legally erred in its claim construction and such errors led to the erroneous legal conclusion that claim 4 was unpatentable over the combination of Pippin, Ikedea and Swamy.

Beyond the Board's failure to appreciate that the "temperature measurement" is a *measurement* of temperature obtained from an internal temperature sensor (claim 4), the Board further erroneously considered the

limitations of claim 6, which further expresses that the temperature measurement "is provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement."

In sharp contrast to claim 6, the interrupt signal of Pippin is a signal that results from substantially altering or hindering the temperature measurement acquired from the programmable Vbe circuit 110. *See* Pippin Fig. 1 (Appx390). The bandgap voltage (Vbe), being agreed to be the temperature measurement in Pippin, is processed by a comparator circuit 160 (sense amplifier) which outputs the interrupt signal. The output interrupt signal cannot then be reasonably considered to be a temperature measurement because the temperature measurement acquired from the programmable Vbe circuit 110 was physically changed to a different electrical signal, *i.e.*, the interrupt signal, which is output from the comparator 160. Thus, as compared to the temperature measurement, Pippin's interrupt signal is certainly not "without any substantial alteration or hindrance to the temperature measurement."

Consequently, the Board legally erred when it relied on Pippin's interrupt signal as disclosing a temperature measurement being "provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement" as recited in claim 6.

As for claims 7 and 19, the Board's analysis went even further astray. Claim 7, for example, further provides that the temperature measurement is provided to circuitry external to the microprocessor where it is compared with *mode-dependent* clock control data to produce clock speed data used in controlling the speed of the microprocessor. The Board legally erred in offering only a single sentence of analysis that was not sufficiently directed to the limitations of claims 7 or 19. Specifically, the Board's analysis lacked any consideration of clock control data based on operational mode, and lacked any consideration for comparing such clock control data with a temperature measurement (obtained internal to the microprocessor) to produce clock speed data. Moreover, the Board failed to articulate adequate reasoning for its decision of unpatentability. Thus, as a matter of law, the Board's consideration of claims 7 and 19 was deficient, prejudicial to Appellant, and requires reversal.

Appellant, having identified various material errors, has timely filed an appeal with this court seeking reversal of the Board's unpatentability conclusions.

ARGUMENT

I. STANDARD OF REVIEW

This court reviews the Board's legal conclusions without deference, or de novo. *In re Applied Materials*, 692 F.3d 1289 (Fed. Cir. 2012). Anticipation and prior art teachings present questions of fact that are reviewed for substantial evidence. *In re NTP, Inc*., 654 F.3d 1279, 1297 (Fed. Cir. 2011). This appeal involves legal issues surrounding claim construction, obviousness and appellate review, and involves various factual disputes.

II. CLAIM 4

The Board's analysis improperly relied on a result-oriented claim construction, which induced an erroneous and distorted view of the claim. Consequently, the Board made material and prejudicial legal errors in considering claim 4.

Claim 4 pertains to a method for thermally managing temperature of a computing apparatus having a microprocessor. The microprocessor operates in accordance with a clock having a clock frequency, and the microprocessor includes an internal temperature sensor. The computing apparatus also includes circuitry external to the microprocessor for thermal management. Still further, the computing apparatus includes a fan controllably operable to cool at least a portion of the computing apparatus. More particularly, claim 4 in its entirety is as follows:

A method for thermally managing temperature of a computing apparatus having a microprocessor, the microprocessor operating in accordance with a clock having a clock frequency, the microprocessor including an internal temperature sensor, the computing apparatus including circuitry external to the microprocessor for thermal management, the computing apparatus including a fan controllably operable to cool at least a portion of the computing apparatus, the method comprising:

receiving, at the circuitry external to the microprocessor, a temperature measurement of the microprocessor from the internal temperature sensor;

managing the temperature of at least the microprocessor of the computing apparatus based at least in part on the temperature measurement provided at least in part by the temperature sensor;

determining which of at least two operational modes the computing apparatus is operating;

retrieving fan control data dependent on at least the operational mode the computing apparatus is operating;

comparing, at the circuitry external to the microprocessor, the temperature measurement with the fan control data to produce fan speed data; and

controlling speed of the fan based on the fan speed data.

Appx71-72.

A. BOARD DID NOT PROPERLY CONSIDER THE TEMPERATURE MEASUREMENT LIMITATIONS OF CLAIM 4

Claim 4 defines its temperature measurement as "a temperature measurement of the microprocessor from the internal temperature sensor." The Board failed to properly consider that not only does the temperature measurement have to be "a temperature measurement of the microprocessor" but also the temperature measurement must be "from the internal temperature sensor" as recited in claim 4. The Board improperly equated the recited limitation of "a temperature measurement of the microprocessor" to Pippin's interrupt signal, or alternatively, to Ikeda's signal from its temperature sensor. *See* Board Decision, p. 5 (Appx5). In effect, the Board improperly construed the claim language and ignored the express language of the claim requiring that the temperature measurement of the microprocessor be from an internal temperature sensor provided internal to the microprocessor.

B. PIPPIN'S INTERRUPT SIGNAL IS NOT A TEMPERATURE MEASUREMENT FROM AN INTERNAL TEMPERATURE SENSOR

The Board and the Examiner erroneously considered Pippin's interrupt signal as a temperature measurement. The Board's reliance on Pippin's interrupt signal was prejudicial error because (as detailed below) the interrupt signal is from a comparator circuit and is therefore neither a temperature measurement nor from an internal temperature sensor. In essence, Pippin's teachings are contrary to claim

4. Therefore, the Board was misguided when it accepted the Examiner's unsupported assertion that Pippin's interrupt signal taught the temperature measurement of claim 4.

Pippin discloses a circuit within a microprocessor specifically designed to measure the temperature of the microprocessor. Pippin itself states, "[t]he programmable Vbe 110 generates a voltage dependent upon the temperature of the integrated circuit…." Pippin, col. 4, lines 64-66 (Appx402). Thus, it is the programmable Vbe circuit 110 that is the internal temperature sensor of claim 4 that provides a temperature measurement of a microprocessor. The Board's Decision on Rehearing and the Examiner's Answer both expressly admit such, stating: "The programmable Vbe contains a sensing portion … the temperature of the microprocessor is measured by the sensing portion [col. 5, lines 22-24]." Decision on Rehearing, p. 2 (Appx12); Examiner's Answer, p. 19 (Appx281).[4]

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[4] Specifically, the Board in referencing the Examiner's findings, stated:

> The programmable Vbe contains a sensing portion and a multiplier portion [col. 4, lines 63-64], wherein the temperature of the microprocessor is measured by the sensing portion [col. 5, lines 22-24]. In general, *temperature of the microprocessor is measured (via the sensing portion) to generate the Vbe and then compares with the reference voltage (via sense amplifier) to generate the interrupt signal.*

Decision on Rehearing, p. 2 (Appx12).

The temperature measurement in Pippin is indeed provided by the programmable Vbe circuit 110 as shown in Fig. 1. This voltage Vbe provided by the programmable Vbe circuit 110 is the bandgap voltage described in Pippin as a principal component of its innovation. *See* Pippin, Figs. 1-5 (Appx390-394). It is this bandgap voltage (Vbe) that is compared (by comparator 160) with a reference voltage (voltage reference 120) to generate Pippin's interrupt signal. Pippin, col. 4, lines 60-67 (Appx402); *see also* Pippin, Fig. 1 (Appx390). If claim 4 were properly construed, then the temperature measurement at issue is a measurement of temperature that is obtained from an internal temperature sensor. The only aspect that is dependent on the temperature in Pippin is the bandgap voltage (Vbe) detected by the programmable Vbe circuit 110 in Fig. 1 and detailed in Figs. 4 and 5.

Consequently, the programmable Vbe circuit 110 of Pippin provides a temperature measurement. However, contrary to claim 4, that temperature measurement is <u>never</u> made external to the integrated circuit of Pippin's microprocessor. In view of this serious deficiency, the Board and the Examiner attempted to therefore improperly rely on the interrupt signal of Pippin.

The Board's attempted justification was that "the interrupt signal of Pippin is indicative of a temperature measurement." Board Decision, p. 6 (Appx6). Claim 4, however, recites "a temperature measurement of the microprocessor from the

internal temperature sensor." Thus, the claim requires a temperature measurement from an internal temperature sensor. A control signal, such as Pippin's interrupt signal, is NOT a temperature measurement. Those of ordinary skill in the art know and understand the distinction between temperature measurement and an interrupt signal.

Pippin's interrupt signal is thus NOT a temperature measurement. Instead, the interrupt signal is a control signal derived from a comparison of the temperature measurement (voltage Vbe) and a reference voltage. This comparison is performed by a comparator 160 (sense amplifier). Pippin, Fig. 1 (Appx390). Once electrically processed, the comparator circuit 160 outputs a new electrical signal that is no longer a temperature measurement; instead, it is a specific control signal known as an interrupt signal. Even if Pippin's interrupt signal were **indicative of** a temperature measurement, as the Board proclaims, that still does not make an interrupt signal a temperature measurement. A closer reading and understanding of Pippin makes it clear that the interrupt signal is clearly not a temperature measurement. Rather, it is a control signal that serves to activate interrupt processing.[5] Therefore, it is not reasonable to, nor would one of ordinary

[5] *See e.g.*, Pippin Fig. 7 (Appx396) shown that the internally generated interrupt signal (by the comparator 160) being supplied to processor unit 705 and microprogram 740. Pippin also refers to the interrupt signal as a comparison signal. Pippin, col. 11, lines 7-9 (Appx406). A comparison signal is also not considered a temperature measurement.

skill in the art, conclude that an interrupt signal is a temperature measurement. Moreover, the fact that the programmable Vbe circuit 110 is part of a larger circuit, *i.e.*, a programmable thermal sensor 100 or even microprocessor 700, 900, does not make the larger circuit a temperature measuring device.

It was unreasonable for the Board and the Examiner to distort and ignore the features of claim 4 as well as distort the teachings of Pippin for a convenient rejection. The Examiner's analysis, as adopted by the Board, was clearly erroneous and operatively contrary to claim 4. Therefore, it is completely unreasonable for the Board to distort or ignore the claim language of claim 4 as well as the teachings of Pippin in an effort to formulate a basis for "expediently" accepting the Examiner's rejection.

C. IKEDEA'S SIGNAL IS NOT FROM AN INTERNAL TEMPERATURE SENSOR

The Board also casually appeared to offer a second source for a temperature measurement. With only conclusory statements, the Board alleged the temperature measured by Ikedea meets the limitations of claim 4. In this regard, the Board's analysis was as follows:

> Ikedea also discloses this claim limitation as the signal the temperature sensor 10 sends to the outside circuitry (*see* Ans. 20 (citing Ikedea, Fig. 1, col. 8, ll. 38--43)). Although the temperature sensor of Ikedea is placed in the vicinity of CPU 2 *(see* Reply Br. 9), one of ordinary skill would recognize Ikedea teaches the sending of a signal to

> the external circuitry that is directly related to the temperature measurement.

Board Decision, p. 5 (Appx5).

The Board's reasoning is defective as the claim limitations recite something different than what was considered by the Board. At a minimum, there is no internal temperature sensor (internal to a microprocessor) anywhere disclosed or suggested in Ikedea that can provide a temperature measurement of a microprocessor to external circuitry. While Ikedea does describe a temperature sensor 10 (col. 8, lines 38-43)(Appx385), such a sensor is not "an internal temperature sensor" that is internal to a microprocessor, as required by claim 4.

Specifically, Ikedea states that "a temperature sensor 10 is provided on an installation substrate of the computer system 1 in the vicinity of the CPU 2 for detecting a temperature around the CPU 2." Ikedea, col. 8, lines 35-38 (Appx385). Ikedea teaches a temperature measurement of a CPU 2 (microprocessor) from a temperature sensor 10 provided in the vicinity of the CPU 2 for detecting temperature around the CPU 2. Hence, Ikedea teaches that its temperature sensor 10 is NOT within the CPU 2 but is on "an installation substrate of the computer system 1." Hence, at best, one skilled in the art would recognize that the CPU 2 corresponds to a microprocessor and that the "installation substrate" would

correspond to a circuit board, *e.g.*, main circuit board, of the computer system 1.[6] Regardless, it is clear that the temperature sensor 10 of Ikedea is not a temperature sensor internal to a microprocessor and thus cannot provide "a temperature measurement of the microprocessor from the internal temperature sensor" as recited in claim 4.

Although Ikedea's temperature sensor 10 does yield a temperature signal, as stated above, it is external to a microprocessor (*i.e.*, CPU 2) and thus is not an internal temperature sensor as required in claim 4.[7] Any signal from Ikedea's temperature sensor 10 is thus not a temperature measurement "from the internal temperature sensor" as recited in claim 4. Hence, Ikedea does not teach or suggest what claim 4 recites, that is, receiving, at circuitry external to the microprocessor, a temperature measurement of the microprocessor provided by the internal temperature sensor.

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[6] On page 20, lines 1-11 (Appx282) of the Examiner's Answer, the Examiner attempted a (newly constructed) tortured reading of Ikedea in which all of Fig. 1 is deemed a "computer system" and reference 1 denotes "circuitry" and reference 2 denotes a processor (CPU). It is correct that CPU 2 would be considered a processor, that is, a microprocessor. But the Examiner ignores the fact that reference 1 is expressly denoted as being a "computer system." Consequently, Ikedea itself teaches that the box shown in Fig. 1 labeled "computer system 1" is a computer system not merely a microprocessor, and that the CPU 2 and the temperature sensor 10 are separate and distinct parts of the computer system 1. Appx380. Further still, the temperature sensor 10 as illustrated and described is not internal to the CPU 2 (microprocessor).

[7] Ikedea itself understood that CPU and microprocessor are interchangeable. *Infra* n. 6.

Yet, for unexplained reasons, the Board found "Ikedea also discloses this claim limitation." Board Decision, p. 5 (Appx5). This is a complete falsehood reliant on an unspecified, unexplained, and excessively broad claim construction. It is entirely unreasonable for the Board to ignore portions of the claim language of claim 4 as well as the limited and contrary teachings of Ikedea. Hence, to the extent that Ikedea is being relied upon, any such rejection would be unsupported by the record and founded on an unlawful claim construction.

Not to be deterred in justifying its initial decision, in the Board's Decision on Rehearing, the Board boldly stated its presumed correctness as to Ikedea as follows:

> The Examiner found, and the Board agreed, that temperature sensor 10 of Ikedea is internal to computer system 1, which contains CPU 2, and that temperature sensor 10 is configured to output the temperature of the CPU to external circuitry, as recited in claim 4 (Ans. 20; Decision 5). In fact, the Examiner relied on Ikedea as disclosing an actual measurement of the CPU temperature to meet the recited step of "receiving, ... a temperature measurement of the microprocessor from the internal temperature sensor," which is considered as being internal to the computer system without necessarily needing to be inside the CPU. *See* Decision 4. Therefore, we are unpersuaded that our Decision was based on erroneous determination of whether Ikedea's temperature sensor is internal to a microprocessor, whereas the Board's Decision agreed with the Examiner's finding regarding receiving at external

> circuitry a *temperature measurement* of the microprocessor.

Decision on Rehearing, pp. 3-4 (Appx13-14).

As per the Board and the Examiner, an internal temperature sensor can be met by being internal to the computer system 1 of Ikedea and thus need not be within CPU 2. That finding is clearly erroneous. Ikedea refers to CPU and microprocessor interchangeably.[8] Thus, the temperature sensor 10 is not taught as being within the CPU 2 (or microprocessor) of Ikedea. Yet, the Board's and the Examiner's assertions that an entire "computer system 1" of Ikedea is somehow an integrated circuit for a microprocessor is nothing but a baseless fabrication. There is no evidence supporting the Board's adoption of the Examiner's theory that the computer system 1 can be considered to be a microprocessor. Such a conclusion is *completely* contrary to the teachings of Ikedea. It is rather outlandish for the Board to adopt such findings that clearly are not supported in fact.

Accordingly, Ikedea does not teach or suggest claim 4 . Specifically, Ikedea offers no teaching or suggestion for "an internal temperature sensor" that is

[8] Ikedea, at col. 4, line 59 (Appx383), notes that microprocessor is the CPU 2. In Ikedea, the abstract and elsewhere indicate that the clock to a microprocessor is controlled, and Fig. 1 clearly shows the CPU 2 as having its clock controlled, which again equates CPU and microprocessor. Also, col. 4, lines 53-54 (Appx383) of Ikedea indicates that the computer system 1 being discussed in Ikedea is "a notebook-type personal computer, installed therein Intel 80486SX microprocessor."

internal to a microprocessor, and thus no teaching or suggestion to provide a temperature measurement from such internal temperature sensor to external circuitry. As a result, the Examiner's alternative theory based on Ikedea is also deficient.

D. BOARD'S DECISION OFFERS NO REASONABLE MOTIVATION OR SUGGESTION TO COMBINE PIPPIN WITH IKEDEA AND SWAMY

One skilled in the art would not be motivated to combine Pippin and Ikedea and Swamy as proposed by the Examiner and adopted by the Board. Contrary to the position taken by the Board, it is unreasonable to conclude that one skilled in the art could modify Pippin to eliminate its *internal* interrupt driven cooling control when such was an integral objective of its invention. "A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of argument reliant upon ex post reasoning." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421, 82 USPQ2d 1385, 1397 (2007).

It was explained to the Board that "the generalized alleged rationale of cost reduction or increased reliability as the basis for combining these prior art references" is not an adequate justification. Appeal Brief, p. 10-11 (Appx123-124). Yet, in conclusory fashion, the Board permitted the combination of references stating: "As explained by the Examiner (Ans. 22-23), providing the sensing portion of a temperature sensor in a microprocessor, as suggested by

Pippin, reduces cost, while including the necessary control signals to operate a fan increases the reliability of the system." Board Decision, pp. 5-6 (Appx5-6).

The Examiner's Answer, as referenced by the Board, attempted to justify the combination of references with the following allegations:

> In response to appellant's argument that there is no motivation or suggestion to combine Pippin with lkedea and Swamy, examiner respectfully disagrees as the modification of Pippin's teachings would reducing the cost of the microprocessor (the microprocessor with the whole thermal sensor 100 integrated therein would cost more than the microprocessor with only the "sensing portion" integrated therein). For example, in the event that the microprocessor needs to be replaced because of the failure of the processing unit, a user would pay less for the microprocessor with only the "sensing portion" integrated therein. Furthermore, the modification of Pippin's teachings would increase the reliability of the system because the fan is controlled after ensuring and confirming the operation state of the fan and the computing apparatus are operating.

Examiner's Answer, pp. 22-23 (Appx284-285).

The Examiner's generalized alleged rationale of cost reduction or increased reliability, even though adopted by the Board, cannot serve as an adequate justification to support the combination of references. "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the

legal conclusion of obviousness." *KSR*, 550 U.S at 418, 82 USPQ2d at 1741 (*quoting In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). Appellant submits that generalized statements such as "reduce the cost" and "increase the reliability" are merely conclusory allegations that do not support the combination of these references.

The interrupt driven cooling control in Pippin is reliant on a thermally initiated interrupt that is generated internal to a microprocessor. Thus, the secondary references of Ikedea and Swamy are not able to be combined with Pippin because Pippin's intra-microprocessor design is necessarily internal to the microprocessor and would not be altered by one skilled in the art to be dependent on external circuitry to provide thermal management of the microprocessor.

Furthermore, neither Ikedea nor Swamy teach or suggest measuring temperature with a thermal sensor internal to the microprocessor, let alone producing an interrupt signal dependent on microprocessor temperature. In fact, Ikedea and Swamy expressly teach against using circuitry internal to a CPU (*e.g.*, microprocessor) for temperature measurement or for performing clock speed control. *See* Ikedea, Fig. 1 (Appx380); Swamy, Fig. 2 (Appx371).

Hence, one skilled in the art would realize that there is no rational reason or any motivation to combine these disparate references as the Examiner proposed. The proposed modification or combination of the prior art would change the

principle of operation of the prior art invention being modified; therefore, such teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Moreover, the Examiner's statements themselves were inherently erroneous. The Examiner suggests that one skilled in the art would remove most of the circuitry of Pippin's programmable thermal sensor from being provided internal to the microprocessor (so as to become external to the microprocessor) because doing so would render the microprocessor less costly to replace if ever required. First, replacement of a microprocessor has no relevance with any of Appellant's claims, or any of Pippin, Ikedea or Swamy. Second, there is no basis in fact to allege that "with only the 'sensing portion' integrated therein" the user would pay less for a microprocessor. Pippin's microprocessor has millions of transistors and to say that making some portion of its programmable thermal sensor external would reduce its cost is pure speculation. The number of transistors for implementing Pippin's programmable thermal sensor would be insignificant compared to the overall number of transistors in a microprocessor and thus would not be a factor affecting cost of a microprocessor.

Furthermore, neither the Board nor the Examiner offered a meaningful explanation of how system reliability would be improved by combining Ikedea or Swamy with Pippin as alleged by the Examiner. Fan control has not been shown

to be unreliable and, even if it were, it is unclear how system reliability would be increased "because the fan is controlled after ensuring and confirming the operation state of the fan and the computing apparatus are operating." "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

Consequently, Appellant submits that reasonings such as "reduce the cost" and "increase the reliability" are merely conclusory and convenient assertions, with no factual foundation. Hence, the Board's conclusion that Pippin, Ikedea and Swamy could be combined to reject the claim is legal error premised on erroneous factual assertions for which there is no supporting evidence. Accordingly, the Board's affirmance of the Examiner's obviousness rejection is reversible error.

E. CONCLUSION

For at least these reasons, it is respectfully submitted that claim 4 is patentably distinct from Pippin alone or in combination with Ikedea and Swamy. In addition, it is submitted that dependent claims 5-19 are also patentably distinct for at least the same reasons as claim 4. The additional limitations recited in the dependent claims need not be further discussed (though some limited discussion follows) as the above-discussed limitations concerning claim 4 are clearly sufficient to distinguish the claimed invention from Pippin, Ikedea and/or Swamy.

Thus, it is respectfully requested that the Board reverse the Examiner's rejection of claims 4-19 under 35 U.S.C. § 103(a).

III. CLAIM 6

Claim 6 depends from claim 4 and recites additional characteristics of the temperature measurement that has been acquired internal to a microprocessor. Specifically, claim 6 further details that "the temperature measurement is provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement."

The Board affirmed the Examiner's rejection of claim 6 but in doing so relied on faulty claim construction. The Board thus made material and prejudicial legal errors with regard to claim 6 that mandates reversal.

A. BOARD FAILED TO ADEQUATELY CONSIDER LIMITATIONS OF CLAIM 6

The Board's treatment of claim 6 shows that it rushed to judgment and failed to properly consider its claim limitations. Specifically, the Board's Decision stated:

> Appellants contend the combination of Pippin with Ikedea and Swamy does not teach or suggest "the temperature measurement is provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement," as recited in claim 6 (App. Br. 13). We are not persuaded because, as discussed above regarding claim 4, the interrupt signal of Pippin is indicative of a temperature measurement that is above a threshold and is directly

> provided to the external circuitry "without any substantial alteration or hindrance to the temperature measurement."

Board Decision, p. 6 (Appx6).

According to the Board's one-sentence analysis, the interrupt signal of Pippin is "indicative of a temperature measurement" and is "directly provided to the external circuitry 'without any substantial alteration or hindrance to the temperature measurement.' " *Id.* In this single sentence, the Board concluded that the interrupt signal was *indicative of* a temperature measurement from an internal temperature sensor that is made available to external circuitry. The Board's legal errors further continue.

As explained previously, Pippin's interrupt signal is not a measurement of temperature. However, the Board's construction of "temperature measurement" was improperly broad as it apparently also includes *an indication of* a temperature measurement. This is clearly a legal error. The Board's assertion that an "indication of a temperature measurement" meets the limitation of a temperature measurement is erroneous. Additionally, the Board's assertion was not adequately supported or explained. It is legally required that the Board explain the factual bases for its findings and must go well beyond conclusory statements. *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App'x 575, 578 (Fed. Cir. 2016); *In re: Nuvasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016). This legal requirement was not met as the Board only offered a conclusory assertion for its finding.

B. BOARD'S CONSTRUCTION OF "TEMPERATURE MEASUREMENT" WAS PREJUDICIAL LEGAL ERROR

In consideration of claim 6, the Board relied on an incorrect claim construction of "temperature measurement."[9] This conclusion was based on the erroneous legal conclusion that Pippin's interrupt signal could be considered a temperature measurement as recited in claims 4 and 6. As was noted above with respect to claim 4, it is *not* reasonable to conclude that one of ordinary skill in the art would construe a temperature measurement to be an interrupt signal as taught in Pippin.

Beyond the Board's failure to understand that the "temperature measurement" is a *measurement* of temperature obtained from an internal temperature sensor (claim 4), the Board further erroneously considered the limitations of claim 6, which further expresses that the temperature measurement "is provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement."

In Pippin, it is clear that the bandgap voltage (Vbe) circuit provides its temperature measurement. Pippin, col. 4, lines 63-66 (Appx383); col. 5, lines 22-

[9] The temperature measurement at issue in claim 6 is the "temperature measurement" recited in parent claim 4. Specifically, the temperature measurement is first introduced in claim 4 as "a temperature measurement of the microprocessor from the internal temperature sensor." Consequently, it is clear that the temperature measurement of claim 6 is the "temperature measurement of the microprocessor from the internal temperature sensor" as recited in claim 4.

24 (Appx384); *see also* Fig. 1, programmable Vbe 110 (Appx390). The Board and the Examiner conceded that the programmable Vbe circuit 110 measures the temperature of the processor. Decision on Rehearing, p. 2 (Appx12); Examiner's Answer, p. 19, 23, 25 (Appx281, Appx285, Appx387). Yet, the Board ignored this fact and instead placed its reliance on the Examiner's allegation that Pippin's interrupt signal is somehow a signal that is *indicative* of a temperature measurement. Board Decision, p. 6 (Appx6). The interrupt signal generated by the comparator (sense amplifier) 160 can, in some embodiments of Pippin, be available outside Pippin's microprocessor (*see* Fig. 9)(Appx398).

However, contrary to the Board's unfounded speculation, the interrupt signal is NOT a temperature measurement from an internal temperature sensor, as required by claims 4 and 6. In sharp contrast to claim 6, the interrupt signal of Pippin is a signal that results from substantially altering or hindering the temperature measurement acquired from the programmable Vbe circuit 110, *see* Fig. 1 (Appx390). The bandgap voltage (Vbe), being agreed to be the temperature measurement in Pippin, is processed by a comparator circuit 160 (sense amplifier) which outputs the interrupt signal. The output interrupt signal cannot then be reasonably considered to be a temperature measurement because the temperature measurement acquired from the programmable Vbe circuit 110 is physically

changed to a different electrical signal, *i.e.*, the interrupt signal, which is output from the comparator 160.

Consequently, the Board legally erred when it relied on Pippin's interrupt signal as a temperature measurement being "provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement" as recited in claim 6. In reality, the Board conceded that Pippin's interrupt signal is *not* a temperature measurement but alleged that it is something akin thereto because it provides some sort of indication of temperature. As an analogy, when one touches a hot cup of coffee one knows it is hot, but one has no basis for knowing its temperature, and thus knowing something is hot is not a temperature measurement and certainly not from a temperature sensor internal to the cup.

C. CONCLUSION

Therefore, it was legal error for the Board to distort the teachings of Pippin as well as the claim language of claim 6 in an effort to formulate a basis for rejection. Hence, the Board's decision should be reversed.

IV. CLAIMS 7 AND 19

Claims 7 and 19 recite use of mode-dependent clock control data that is used in controlling microprocessor speed (claim 7) or performance (claim 19).

Claim 7 is instructive and specifically recites limitations that detail the retrieval of the mode-dependent clock control data, and then use thereof to control speed of a microprocessor. Specifically, claim 7, which depends from claims 4 and 6, additionally recites:

> wherein the method comprises:
>
> retrieving clock control data dependent on at least the operational mode the computing apparatus is operating;
>
> comparing, by the circuitry external to the microprocessor, the temperature measurement with the clock control data to produce clock speed data; and
>
> controlling speed of the microprocessor based on the clock speed data.

Appx72.

Hence, claim 7 provides that the temperature measurement is provided to circuitry external to the microprocessor where it can be compared with *mode-dependent* clock control data to produce clock speed data used in controlling the speed of the microprocessor.

A. BOARD FAILED TO ADEQUATELY CONSIDER LIMITATIONS OF CLAIM 7

The Board's curt treatment of claim 7 shows that it rushed to judgment and failed to properly consider the claim limitations. Specifically, the Board's one sentence decision was:

> Regarding the teachings of Ikedea, we agree with the Examiner's findings that the high and low clock speeds, which are based on the temperature of the microprocessor, correspond to the normal mode and the power saving mode of the microprocessor, respectively (*see* Ans. 25 (citing Ikedea col. 4, l. 58 - col. 5, l. 7; col. 6, ll. 8-11 and 50-67)).

Board's Decision, p. 7 (Appx7).

Sadly, the Board's analysis was not directed to the limitations of claim 7. Claim 7 provides that clock control data is retrieved depending on which operation mode is operational. Then, the mode-dependent clock control data is compared with a temperature measurement of the microprocessor to produce clock speed data, and thereafter the speed of the microprocessor is controlled based on the clock control data. The Board, however, just considered that the high and low clock speeds (respectively considered by the Board as normal and power saving modes) are based on temperature. That is, the Board relied on Ikedea as simply disclosing the use of temperature to determine clock speed, which can be illustrated as:

Temperature → Clock speed

Claim 7, however, is claiming something demonstrably different. Claim 7 claims retrieval of clock control data (CCD) based on an operational mode (M) of a computing apparatus. Then, that retrieved clock control data can be compared (Δ) with a temperature measurement (TM) of a microprocessor to yield clock speed data (CSD), and then the speed of the microprocessor can be controlled based in the clock speed data. This can be illustrated as:

$$\begin{array}{l} M \rightarrow CCD \rightarrow \Delta \rightarrow CSD \rightarrow \text{Microprocessor Speed} \\ \qquad\qquad\quad\ \uparrow \\ \qquad\qquad\quad\ TM \end{array}$$

Hence, contrary to the Board's Decision, claim 7 expressly distinguishes *clock control data*, which is mode dependent and compared with microprocessor temperature measurement, from *clock speed data*, which controls microprocessor speed.

Thus, the Board's simplistic finding that high and low clock speeds used in Ikedea are based on temperature of a microprocessor is insufficient to support an obviousness rejection of claim 7. Board Decision, p. 7 (Appx7). The Board's analysis lacks any consideration of clock control data based on operational mode, and lacks any consideration for comparing such clock control data with a microprocessor temperature measurement.

Moreover, the Board's one-sentence justification failed to adequately "articulate its reasoning for making its decision." *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App'x at 578 (citing *In re Sang-Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002)). It is a legal requirement for the Board to explain the factual bases for its findings and such explanation must go well beyond "conclusory statements." *Id.; In re: Nuvasive, Inc.*, 842 F.3d at 1383 (" 'conclusory statements' alone are insufficient and, instead, the finding must be supported by a 'reasoned explanation.' ").

Thus, as a matter of law, the Board's consideration of claim 7 was deficient, prejudicial to Appellant, and requires reversal.

B. EXAMINER'S REJECTION ALSO LACKED ADEQUATE CONSIDERATION

The Examiner's rejection fares no better. In rejecting claim 7, the Examiner merely stated:

> As per claim 7, lkedea teaches retrieving clock control data dependent on at least the operational mode the computing apparatus is operating [col. 5, lines 1-7; col. 6, lines 8-11]; comparing, by the circuitry external to the microprocessor, the temperature measurement with the clock control data to produce clock speed data; and controlling speed of the microprocessor based on the clock speed data [col 8, lines 43-58].

Office Action, p. 10 (Appx219).

The Examiner simply copied the claim language and alleged that Ikedea provides such teachings. The rejection lacked any meaningful assertion that would support a reasonable rationale of unpatentability. "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Moreover, whenever combining references in an effort to make a rejection, "[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of argument reliant upon ex post reasoning." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. at 421, 82 USPQ2d at 1397 (2007). Obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741.

The Examiner's Answer attempted to tardily justify its rejection of claim 7, stating:

> Furthermore, lkedea discloses that the computing apparatus operates in normal mode with high speed CPU clock or in power saving mode with low speed CPU clock based on the temperature of the microprocessor [col. 4, line 58 to col. 5, line 7; col. 6, lines 8-11, 50-67]. Depends on which mode the computing apparatus is operating, a high speed clock or a low speed clock is supplied to the CPU [col. 4, line 58 to col. 5, line 7].

> Therefore, lkedea teaches "retrieving clock control data dependent on at least the operational mode the computing apparatus is operating" as claimed.

Examiner Answer, p. 25 (Appx287).[10]

Here, the Examiner attempted to allege that a high speed clock or a low speed clock is supplied to the CPU depending "on which mode the computing apparatus is operating." This is simply an assertion that Ikedea teaches clock speed is mode dependent. The only mention of "clock control data" is the Examiner's conclusory statement that quotes the first element (retrieving step) of claim 7.

Additionally, the Examiner failed to address the remaining limitations of claim 7, namely, "comparing, by the circuitry external to the microprocessor, the temperature measurement with the clock control data to produce clock speed data," which is the second element (comparing step) of claim 7. There are no allegations that this limitation of claim 7 is present in Ikedea or any other reference.

For at least these additional reasons, the Board did not and cannot properly establish a legitimate basis to reject claim 7 as obvious over Pippin, Ikedea and Swamy. Accordingly, as a matter of law, the Board's consideration of claim 7 was deficient, prejudicial to Appellant, and requires reversal.

[10] The Examiner's Answer, at page 9 (Appx271), also repeats the Office Action's prior statement as to claim 7.

C. IKEDEA IS UNABLE TO REMEDY PIPPIN'S DEFICIENCIES

Although the lack of any meaningful analysis by the Examiner and the Board renders the rejection of claim 7 unlawful, for the sake of avoiding any doubt, it is further considered whether the Board's few citations to Ikedea might somehow be distorted into being considered a supporting analysis.

The Board and the Examiner failed to offer any explanation or analysis for their few citations to Ikedea. For example, the Board and Examiner cite column 4, lines 58 to column 5, line 7 of Ikedea to reject claim 7. However, the citation describes selectively supplying a high speed clock or a low speed clock to the CPU 2 of computer system 1 for respectively operating the CPU 2 in a normal mode or a power saving mode. The Board and Examiner also cite column 6, lines 8-11 and 50-67 of Ikedea (Appx384). However, the citations merely describe use of the high speed clock for normal mode operation and also a repeated access state in which the low speed clock is used, as opposed to a high speed clock if not in the repeated access state. Lastly, they cite column 8, lines 43-58 (Appx385) of Ikedea, which merely describes comparing a detected temperature Tm with a predetermined set temperature Ts at comparator 11. Neither the Board nor the Examiner offered any explanation for these citations to Ikedea.

Initially, it is noted that mere citations are not enough. This court has explained:

> The PTAB must provide "a reasoned basis for the agency's action," and "we will uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned." Bowman Transp., Inc. v. Ark.-Best Freight Sys., Inc., 419 U.S. 281, 285, 286 (1974). The PTAB's own explanation must suffice for us to see that the agency has done its job and must be capable of being "reasonably . . . discerned" from a relatively concise PTAB discussion. In re Huston, 308 F.3d 1267, 1281 (Fed. Cir. 2002). We have, however, identified some insufficient articulations of motivation to combine. First, "conclusory statements" alone are insufficient and, instead, the finding must be supported by a "reasoned explanation." Lee, 277 F.3d at 1342, 1345. Second, it is not adequate to summarize and reject arguments without explaining why the PTAB accepts the prevailing argument. See Cutsforth, Inc. v. MotivePower, Inc., 636 F. App'x 575, 578 (Fed. Cir. 2016).

In re: Nuvasive, Inc., 842 F.3d at 1383.

Here, the citations, which exclusively rely on Ikedea, fail to advance any additional support for the Board's rejection of claim 7.

Claim 7 recites "retrieving clock control data dependent on at least the operational mode the computing apparatus is operating." On page 10 of the Office Action (Appx219), the Examiner relies on col. 5, lines 1-7 and col. 6, lines 8-11 of Ikedea (Appx384). However, these portions of Ikedea merely indicate that Ikedea can make use of a high speed clock and a low speed clock. As such, there is no teaching or suggestion for "clock control data" to be dependent on operational mode of a computing apparatus. In fact, in Ikedea, the temperature indicative signal Tm is compared by a comparator 11 to a "predetermined set temperature

Ts." Ikedea, col. 8, lines 43-44 (Appx385). *See also*, Fig. 1 (Appx380). Hence, the predetermined set temperature Ts (which is the only thing one could possibly correspond to claim 7's clock control data) is just that - set and predetermined - and thus cannot be "dependent on operational mode".

Consequently, in contrast to claim 7, nothing in Ikedea teaches or suggests (i) "retrieving clock control data dependent on at least the operational mode the computing apparatus is operating" or (ii) "comparing, by the circuitry external to the microprocessor, the temperature measurement with the clock control data to produce clock speed data" as recited in claim 7. Thus, even if the Board or the Examiner had saw fit to provide an explanation for a rejection, that rejection would be defective because Ikedea is unable to supply teachings for the limitations of claim 7.

D. CONCLUSION

Based on any of the foregoing reasons, it is submitted that claim 7, and for similar reasons claim 19, are not rendered obvious by the attempted combination of Pippin, Ikedea and Swamy. Consequently, the Board's Decision affirming the Examiner's obviousness rejection of claims 7 and 19 was legally erroneous and must be reversed.

CONCLUSION

The Board made several serious errors in this IPR proceeding to the detriment of Appellant. For any of the numerous reasons above, the Board's decision and judgment must therefore be reversed and the Board's order regarding its judgment must be vacated.

Dated: March 6, 2017

Respectfully Submitted,

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ADDENDUM

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte C. DOUGLASS THOMAS and ALAN E. THOMAS

Appeal 2014-006984
Application 13/099,285
Technology Center 2100

Before MAHSHID D. SAADAT, CHARLES J. BOUDREAU, and ADAM J. PYONIN, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellants[2] appeal under 35 U.S.C. § 134(a) from the Non-final Rejection of claims 4–19, which constitute all the claims pending in this application.[3] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] An oral hearing was held for this appeal on April 6, 2016.

[2] According to Appellants, the real party in interest is IpVenture, Inc. (App. Br. 1).

[3] Claims 1–3 have been canceled.

STATEMENT OF THE CASE

Appellants' invention relates to methods for thermal and power management in computing devices. Claim 4 is illustrative of the invention and reads as follows:

> 4. A method for thermally managing temperature of a computing apparatus having a microprocessor, the microprocessor operating in accordance with a clock having a clock frequency, the microprocessor including an internal temperature sensor, the computing apparatus including circuitry external to the microprocessor for thermal management, the computing apparatus including a fan controllably operable to cool at least a portion of the computing apparatus, the method comprising:
>
> receiving, at the circuitry external to the microprocessor, a temperature measurement of the microprocessor from the internal temperature sensor;
>
> managing the temperature of at least the microprocessor of the computing apparatus based at least in part on the temperature measurement provided at least in part by the temperature sensor;
>
> determining which of at least two operational modes the computing apparatus is operating;
>
> retrieving fan control data dependent on at least the operational mode the computing apparatus is operating;
>
> comparing, at the circuitry external to the microprocessor, the temperature measurement with the fan control data to produce fan speed data; and
>
> controlling speed of the fan based on the fan speed data.

Claims 4–19 stand rejected under the judicially created doctrine of non-statutory obviousness-type double patenting over claims 1–28 of U.S. Patent No. 7,937,599 B1, issued May 3, 2011 (*see* Ans. 3).

Claims 4–8 and 11–19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pippin (US 7,216,064 B1; May 8, 2007), Ikedea (US 5,664,201; Sept. 2, 1997), and Swamy (US 5,623,594; Apr. 22, 1997) (*see* Ans. 4–12).

Claims 9 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pippin, Ikedea, Swamy, and Gunn (US 5,436,827; July 25, 1995) (*see* Ans. 12–13).

ANALYSIS

Non-statutory Obviousness-type Double Patenting Rejection

U.S. Patent No. 7,937,599, which served as the basis for the non-statutory obviousness-type double patenting rejection, was involved in an interference proceeding that resulted in the cancellation of all of its claims. *See Thomas v. Pippin*, Interference 105,957 (PTAB Jan. 26, 2015) (Paper 297), *aff'd* 628 Fed. App'x 766 (mem.) (Fed. Cir. 2016). Accordingly, we consider the non-statutory obviousness-type double patenting rejection as moot and do not reach the merits of that rejection.

35 U.S.C. § 103 Rejections

With respect to both rejections under 35 U.S.C. § 103, we disagree with Appellants' conclusions. We adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken and (2) the reasons set forth by the Examiner in the Examiner's Answer (Ans. 18–28) in response to Appellants' Appeal Brief. We concur with the conclusions reached by the Examiner and highlight and address specific findings and arguments for emphasis as follows.

Claim 4

In rejecting claim 4, the Examiner finds Pippin discloses the recited method for thermally managing the temperature of a computing apparatus having a microprocessor which operates in accordance with a clock having a clock frequency and includes an internal temperature sensor (Ans. 4–5) and further relies on Ikedea as teaching the receiving, managing, determining, and comparing steps for controlling the speed of a fan (Ans. 6–7). The Examiner finds Swamy's disclosure in columns 3, 6, and 7 teaches the recited step of "retrieving fan control data dependent on the operational mode the computing apparatus is operating" (Ans. 7–8). The Examiner concludes it would have been obvious to one of ordinary skill in the art to combine the teachings of Pippin and Ikedea with Swamy in order to achieve a higher level of reliability (Ans. 8).

Appellants contend the proposed combination is improper because Figure 9 of Pippin shows programmable thermal sensor 110 produces an interrupt signal that is internal to microprocessor 900 and is supplied to external sensor logic 940 (App. Br. 8–10). In particular, Appellants argue the interrupt signal of Pippin, which is the only signal that is externally available, is not a temperature measurement, as required by claim 4 (App. Br. 8). With respect to Ikedea, Appellants contend the cited passage in column 8, lines 38–43, refers to the location of temperature sensor 10 as placed in the vicinity of CPU 2, which is not internal to the microprocessor (App. Br. 9; Reply Br. 9). Lastly, Appellants contend Swamy describes "a decision in a control process where a fan can be activated if not presently 'on' or the fan can increase its speed if already 'on'" (App. Br. 10).

Appellants' arguments are not persuasive. With respect to Pippin, we agree with the Examiner's finding that the disclosed interrupt signal meets the recited limitation of "a temperature measurement of the microprocessor" because the signal is sent to indicate the microprocessor has attained a certain temperature, or a threshold temperature (Ans. 19). As further explained by the Examiner, Ikedea also discloses this claim limitation as the signal the temperature sensor 10 sends to the outside circuitry (*see* Ans. 20 (citing Ikedea, Fig. 1, col. 8, ll. 38–43)). Although the temperature sensor of Ikedea is placed in the vicinity of CPU 2 (*see* Reply Br. 9), one of ordinary skill would recognize Ikedea teaches the sending of a signal to the external circuitry that is directly related to the temperature measurement. Lastly, regarding Swamy, we agree with the Examiner's findings (*see* Final Act. 9–10; Ans. 21–22) that trace 140 forms a temperature sensor for determining the operating mode, such as whether a cooling fan is to be turned on or, if the fan is on, to modify the fan speed (*see also* Swamy col. 6, ll. 54–58).

Next, Appellants argue the combination of Pippin with Ikedea and Swamy is improper because: (1) "the generalized alleged rationale of cost reduction or increased reliability as the basis for combining these prior art references" is not an adequate justification (App. Br. 11–12) and (2) "the interrupt driven cooling control in Pippin is reliant on a thermally initiated interrupt that is generated internal to a microprocessor," which is not cured by the secondary references to Ikedea and Swamy (App. Br. 12).

We are not persuaded of Examiner error. As explained by the Examiner (Ans. 22–23), providing the sensing portion of a temperature sensor in a microprocessor, as suggested by Pippin, reduces cost, while including the necessary control signals to operate a fan increases the

reliability of the system. Furthermore, Appellants' argument regarding the interrupt signal of Pippin is not persuasive for the reasons stated above in our analysis of Pippin. Therefore, consistent with the guidelines stated in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), the Examiner's rejection is based on improvements made by the combination to the method of Pippin for reducing the overheating problem of a processor. Indeed, the Supreme Court has indicated that:

> [It is error to] assum[e] that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. . . . Common sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.

KSR, 550 U.S. at 420 (citations omitted). Therefore, the Examiner has articulated how the claimed features are suggested by the proposed combination of the reference teachings with some rational underpinning. *See KSR*, 550 U.S. at 418.

Claim 6

Appellants contend the combination of Pippin with Ikedea and Swamy does not teach or suggest "the temperature measurement is provided to the circuitry external to the microprocessor without any substantial alteration or hindrance to the temperature measurement," as recited in claim 6 (App. Br. 13). We are not persuaded because, as discussed above regarding claim 4, the interrupt signal of Pippin is indicative of a temperature measurement that is above a threshold and is directly provided to the external circuitry "without any substantial alteration or hindrance to the temperature measurement."

Claim 7

Regarding claim 7, Appellants rely on the same argument made for claim 4 with respect to Pippin's teaching of temperature measurement that is external to the microprocessor (App. Br. 15). Appellants further contend Ikedea does not provide the missing teaching because the portions of Ikedea in columns 5 and 6 indicate implementing a high speed clock and a low speed clock, which is not the same as the recited "'clock control data' to be dependent on operational mode of a computing apparatus" (App. Br. 15–16).

Appellants' arguments do not persuade us of Examiner error. As discussed above for claims 4 and 6, the interrupt signal of Pippin relates to a temperature measurement that identifies temperatures above a threshold. Regarding the teachings of Ikedea, we agree with the Examiner's findings that the high and low clock speeds, which are based on the temperature of the microprocessor, correspond to the normal mode and the power saving mode of the microprocessor, respectively (*see* Ans. 25 (citing Ikedea col. 4, l. 58–col. 5, l. 7; col. 6, ll. 8–11 and 50–67)).

Claim 19

Appellants argue the patentability of claim 19 by relying on arguments that are similar to those raised with respect to claim 7 and are addressed above. For the same reasons stated for claim 7, Appellants' contentions for claim 19 do not persuade us of Examiner error.

CONCLUSION

For the foregoing reasons, Appellants' arguments have not persuaded us that the Examiner erred in finding the combination of Pippin with Ikedea and Swamy teaches or suggests the disputed limitations of claims 4, 6, 7, and 19. Accordingly, we sustain the 35 U.S.C. § 103(a) rejections of independent claims 4, 6, 7, and 19, as well as the remaining claims which are not argued separately.

DECISION

The decision of the Examiner to reject claims 4–19 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte C. DOUGLASS THOMAS and ALAN E. THOMAS

Appeal 2014-006984
Application 13/099,285
Technology Center 2100

Before MAHSHID D. SAADAT, CHARLES J. BOUDREAU, and ADAM J. PYONIN, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON REQUEST FOR REHEARING

Appellants request rehearing of the June 1, 2016, Decision on Appeal ("Decision"), wherein we affirmed the rejections of claims 4–8 and 11–19 as being unpatentable over Pippin, Ikedea, and Swamy and of claims 9 and 10 as being unpatentable over Pippin, Ikedea, Swamy, and Gunn. We have reconsidered the Decision in light of Appellants' arguments, but, for the reasons given below, we are not persuaded any points were misapprehended or overlooked by the Board in our Decision therein.

A. "temperature measurement" of Claim 4

Pippin

Appellants argue the only temperature measurement in Pippin is provided by Programmable V_{be} 110, as shown in Pippin's Figure 1, which is

a part of Programmable Thermal Sensor 100 (Req. Reh'g 2). Appellants further contend the interrupt signal of Pippin, which is a control signal derived from a temperature measurement and is provided to external circuitry, is not a temperature measurement, as required by claim 4 (Req. Reh'g 3). Appellants assert the Board failed to consider the language of claim 4 with respect to the temperature measurement as well as the teachings of Pippin in its Decision (Req. Reh'g 3–4).

The Examiner made the following findings:

> Pippin teaches that the temperature sensor (thermal sensor 100) monitors the temperature of the microprocessor and outputs a signal (labeled as "interrupt") *to indicate that the microprocessor attains to a certain temperature, e.g. 100°F (threshold temperature)* [col. 4, lines 51-57; col. 10, lines 12-24; col. 11, lines 1-5, 10-12].
> . . .
> The programmable V_{be} contains a sensing portion and a multiplier portion [col. 4, lines 63-64], wherein the temperature of the microprocessor is measured by the sensing portion [col. 5, lines 22-24]. In general, *temperature of the microprocessor is measured (via the sensing portion) to generate the V_{be} and then compares with the reference voltage (via sense amplifier) to generate the interrupt signal*.

(Ans. 19) (emphases added). The Examiner explained that Pippin teaches the recited step of "receiving, at the circuitry external to the microprocessor, a temperature measurement of the microprocessor from the internal temperature sensor" because "the signal (interrupt) outputted from the temperature sensor is to indicate the temperature of the microprocessor (e.g. microprocessor attains 100°F)" (*id.*).

The Board agreed with and adopted those findings (Decision 5). As explained by the Examiner, the interrupt signal provides a measurement of

the microprocessor temperature by indicating whether that temperature is above, or below, a threshold level. Although the signal itself may not be in the form of a value in degrees, the outputted signal is an indication or measurement of whether the microprocessor is getting hot or is still operating in a safe temperature range, *i.e.*, a temperature measurement (*see also* Appellants' Spec. ¶ 36). Therefore, we are unpersuaded that our Decision was based on erroneous determination of whether Pippin teaches the disputed limitation.

Ikedea

Appellants argue the Board's reasoning with respect to the teachings of Ikedea is defective because Ikedea's temperature sensor is external to a microprocessor (Req. Reh'g 4). Appellants further contend Ikedea does not disclose any internal temperature sensor that can provide a temperature of a microprocessor to external circuitry (*id.*).

The Examiner found, and the Board agreed, that temperature sensor 10 of Ikedea is internal to computer system 1, which contains CPU 2, and that temperature sensor 10 is configured to output the temperature of the CPU to external circuitry, as recited in claim 4 (Ans. 20; Decision 5). In fact, the Examiner relied on Ikedea as disclosing an actual measurement of the CPU temperature to meet the recited step of "receiving, . . . a temperature measurement of the microprocessor from the internal temperature sensor," which is considered as being internal to the computer system without necessarily needing to be inside the CPU. *See* Decision 4. Therefore, we are unpersuaded that our Decision was based on erroneous determination of whether Ikedea's temperature sensor is internal to a microprocessor, whereas the Board's Decision agreed with the Examiner's

finding regarding receiving at external circuitry a *temperature measurement* of the microprocessor.

B. "temperature measurement" of Claim 6

Appellants argue the Board has erroneously relied on Pippin and Ikedea as disclosing the recited "temperature measurement" in claim 6 and provide arguments similar to those raised for claim 4, which are addressed above (Req. Reh'g 5–7). For the same reasons discussed above for claim 4, we are not persuaded by Appellants' arguments that the Board improperly relied on an incorrect understanding of a temperature measurement, as urged by Appellants.

DECISION

Based on the foregoing, we have granted Appellants' request to the extent that we have reconsidered our Decision, but we deny Appellants' request to make any changes therein.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(v).

DENIED

CERTIFICATE OF FILING AND SERVICE

I hereby certify that on this 6th day of March, 2017, I caused this Brief of Appellant to be filed electronically with the Clerk of the Court using the CM/ECF System, which will send notice of such filing to the following registered CM/ECF users:

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Upon acceptance by the Clerk of the Court of the electronically filed document, the required number of copies of the Brief of Appellant will be hand filed at the Office of the Clerk, United States Court of Appeals for the Federal Circuit in accordance with the Federal Circuit Rules.

/s/ C. Douglass Thomas
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Dated: March 6, 2017

/s/ C. Douglass Thomas
Counsel for Appellant