No. 08-964

IN THE

Supreme Court of the United States

BERNARD L. BILSKI AND RAND A. WARSAW,
Petitioners,
v.

DAVID J. KAPPOS, UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND DIRECTOR, PATENT AND TRADEMARK OFFICE,
Respondent.

On Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit

BRIEF FOR MICROSOFT CORPORATION, KONINKLIJKE PHILIPS ELECTRONICS N.V., AND SYMANTEC CORPORATION AS AMICI CURIAE IN SUPPORT OF RESPONDENT

HORACIO E. GUTIÉRREZ
T. ANDREW CULBERT
MICROSOFT CORPORATION
INTELLECTUAL PROPERTY & LICENSING
One Microsoft Way
Redmond, WA 98052
(425) 882-8080

MARK A. PERRY
Counsel of Record
MATTHEW D. MCGILL
JASON B. STAVERS
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Avenue N.W.
Washington, D.C. 20036
(202) 955-8500

Counsel for Microsoft Corporation

ADDITIONAL COUNSEL LISTED ON INSIDE COVER

JACK E. HAKEN
KEVIN C. ECKER
LAURIE GATHMAN
TODD HOLMBO
PHILIPS INTELLECTUAL
PROPERTY & STANDARDS
345 Scarborough Road
Briarcliff Manor, NY 10510
(914) 945-6000
Counsel for Koninklijke Philips Electronics N.V.

JOSEPH T. FITZGERALD
SYMANTEC CORPORATION
LEGAL & PUBLIC AFFAIRS
350 Ellis Street, Bldg. A
Mountain View, CA 94043
(650) 527-2733
Counsel for Symantec Corporation

QUESTION ADDRESSED BY AMICI CURIAE

Whether affirming the rejection of petitioners' application, under the appropriate standard of patent-eligibility, would "exclude[] forms of information-based and software-implemented inventions arising from new technological capabilities." Pet. App. 64a (Newman, J., dissenting).

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BRIEF OF MICROSOFT CORPORATION, KONINKLIJKE PHILIPS ELECTRONICS N.V., AND SYMANTEC CORPORATION AS AMICI CURIAE IN SUPPORT OF RESPONDENTS

Microsoft Corporation, Koninklijke Philips Electronics N.V., and Symantec Corporation, as *amici curiae*, respectfully submit that the judgment of the court of appeals should be affirmed.[1]

INTEREST OF AMICI CURIAE

Microsoft's mission is to enable individuals and businesses throughout the world to realize their full potential by creating technology that transforms the way people work, play, and communicate. Microsoft develops, manufactures, licenses, and supports a wide range of software programs and services for many different types of computing devices, including the flagship *Windows* operating system and the *Office* suite of productivity applications.

Koninklijke Philips Electronics N.V. (aka Royal Philips Electronics N.V.) is the parent corporation of a worldwide family of companies ("Philips"). Philips has been inventing and manufacturing electronic and electrical products for over 115 years and is one of the largest users of the patent system in the

[1] Pursuant to this Court's Rule 37.6, *amici* state that no party's counsel authored this brief in whole or in part, and no person or entity, other than *amici* and their counsel, made a monetary contribution to the preparation or submission of this brief. Counsel of record for both petitioners and respondent have consented to the filing of *amicus* briefs in letters that have been lodged with the Clerk.

United States. Philips began operation as a Nineteenth Century electric lamp manufacturer and its history is rooted in the classic patent battles of the industrial age. Scientists and engineers at Philips' American laboratories have made pioneering advances in the fields of medical diagnosis and imaging, high definition television, optical CD and DVD recording, and digital rights management.

Symantec is a global leader in providing security, storage, and systems management solutions to help its customers—from consumers and small businesses to the largest global organizations—secure and manage their information against risk. Symantec operates in more than 40 countries, and maintains research and development facilities, 24x7 Security Operations Centers, and Security Response Labs around the world. The company holds more than 700 patents in its global patent portfolio, addressing security, systems management, and storage needs for consumers, small business and enterprises.

Individually and collectively, *amici* hold a large number of patents, including patents that claim computer-implemented methods, and they are also frequently sued for infringement by others who hold such patents. *Amici* thus have a profound interest in the patent-eligibility of process patents in general and computer-implemented process claims in particular, as part of their substantial stake in the efficient and fair functioning of the patent system as a whole.

SUMMARY OF ARGUMENT

Because principles are not patentable, petitioners' claimed method of hedging commodities transactions is not patent-eligible and the judgment of the court of appeals should be affirmed, although its exclusive reliance on the "machine-or-transformation" test should be disapproved. That test, as articulated by the Federal Circuit, is not consistent with this Court's cases, and it is already proving unwieldy and confusing to implement. Contrary to the suggestions of petitioners and others, however, affirming the rejection of the application in issue need not—and, under the appropriate standard of patent-eligibility, would not—imperil properly drawn claims describing computer-implemented processes.

I. Some have expressed concern that affirming the rejection of petitioners' application would "exclude[] forms of information-based and software-implemented inventions arising from new technological capabilities." Pet. App. 64a (Newman, J., dissenting). Dispelling that concern requires a basic understanding of how computer-implemented processes work in the real world. While electronic computers have become ubiquitous and almost infinitely varied in form and function, virtually all of them rely for their operation on the same physical activity—the routing and rerouting of electrical signals by means of on-off switches such as transistors. A "hardware" device, such as a laptop computer, contains millions of tiny transistor switches; "software" is the set of instructions that determines the configuration of and directs electrical signals through these switches so that the device will do something useful. While both hardware and software have become increasingly complex, the underlying activity—the sequential operation of switches—has been the basis of patent-eligible processes since at least the Industrial Revolution.

II. Although the Court should be chary of "lin[king] patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes" (Pet. App. 134a (Rader, J., dissenting)), we respectfully submit that the eligibility framework that this Court developed during the Industrial Revolution—an era of tremendous advances in electronic and communications technology—retains its vitality, and relevance, today. While modern digital and computer technologies are vastly more complex and efficient than their precursors, they are built upon the same physical activity as Industrial Age analogues such as Morse's telegraph and Bell's telephone. Interpreting the same constitutional and statutory language that controls today, the Nineteenth Century precedents established that a patent-eligible process must involve one or more *disclosed physical things*—that is, it must describe a series of steps that use physical means to produce a result or effect in the physical world. *See*, *e.g.*, *Tilghman* v. *Proctor*, 102 U.S. 707, 727 (1881) ("Whoever discovers that a *certain useful result* will be produced, in any art [*i.e.*, process] …, *by the use of certain means*, is entitled to a patent for it") (emphasis added). This standard is fatal to petitioners' application, but should not imperil the patent-eligibility of properly drawn claims describing computer-implemented processes.

ARGUMENT

Everyone agrees that "a principle is not patentable." *Le Roy* v. *Tatham*, 55 U.S. 156, 174-75 (1853). Petitioners' patent application, which claims a method of hedging commodities transactions, runs smack into this unchallenged prohibition. *See* U.S. Br. 53-54; *see also* Yahoo Br. 34-35; Business Software Alliance Br. 16-18. Indeed, not one of the seventeen amicus briefs filed in support of petitioners offers a credible defense of the actual application at issue in this case. The judgment of the court of appeals, affirming the rejection of petitioners' application, should be affirmed—although, as explained below, its adoption of the "machine-or-transformation" rubric as the exclusive test for patent-eligibility should be disapproved.

Contrary to the suggestions of petitioners and others, affirming the rejection of the application in issue need not, and under the appropriate standard would not, imperil the patent-eligibility of properly drawn claims describing computer-implemented processes. To demonstrate this, we first outline the practical and technological contours of computer-related inventions, and then explain how the patent-eligibility of such inventions can comfortably be resolved within the traditional eligibility framework developed by this Court in response to great advances in electronic and communication technologies during the Nineteenth Century. Under that framework, a patentable process must involve one or more *disclosed physical things*—that is, it must describe a series of steps that use physical means to produce a result or effect in the physical world.[2]

[2] "Physical" means anything discernible or measurable, including (for example) electromagnetic signals propagated through the air, electric current transmitted by wire, electrostatic or magnetic charges on appropriate media, or photonic impulses through a fiber optic cable. *See* John B. Anderson, *Digital Transmission Engineering* 1-5 (2 ed. 2005).

I. From The Twenty-First Century To The Nineteenth: Innovation Through The Sequential Operation Of Switches

Some knowledgeable observers of our patent system have expressed concern that affirming the rejection of petitioners' application, particularly under the "machine-or-transformation" framework adopted as exclusive by the Federal Circuit majority, could "exclude[] forms of information-based and software-implemented inventions arising from new technological capabilities." Pet. App. 64a (Newman, J., dissenting); *see also* Dolby Br. 10; IBM Br. 17-19; Medtronic Br. 5-11.

Petitioners previously echoed this concern, arguing in their petition that "the Federal Circuit's decision threatens many of the nation's fundamental industries, including software" because it "casts doubt" on "tens of thousands of software patents," leaving them "vulnerable to attack." Pet. 30. Petitioners' merits brief, which concedes that the method claimed in their application "does not necessarily have to be performed on a particular machine or computer" (Pet. Br. 7), fails to make good on this threat; indeed, "software" makes only a brief and non-substantive appearance. *See* Pet. Br. 40.

As the Solicitor General explains, "this case does not present any question as to the application of the machine-or-transformation test to software or yet more novel future forms of industrial or technological processes." U.S. Br. 37. Nevertheless, since the patent-eligibility of computer-implemented processes could obviously be impacted by the Court's resolution of this dispute, this Court should be mindful of this potential impact in articulating any general standard or test for patent eligibility.

Clearly, specific interpretations of the test articulated below have proven problematic. *See*, *e.g.*, Yahoo Br. 9-13; Borland Br. 19-28; AIPPI Br. 28-32; Awaken IP Br. 13-23; Entrepreneurial Software Companies Br. 16-22. Although the *judgment* of the court of appeals is correct, the majority erred in opining that the non-statutory "machine-or-transformation" test is the exclusive measure of patent-eligibility. That test has proven overly difficult to implement in practice. *See* Yahoo Br. 9-17; Dolby Br. 10-11; Regulatory Datacorp Br. 23-26. Moreover, even when that test is useful, it is *descriptive* rather than prescriptive: A process that meets the test is likely to be patent-eligible, but the test itself is not a prerequisite to patentability.

As explained further below, the eligibility standard that has traditionally been applied by this Court requires that a patent-eligible process must involve one or more disclosed physical things—that is, it must describe a series of steps that use physical means to produce a result or effect in the physical world. The inventor must disclose an embodiment of a process that is susceptible to practical application using physical means and disclose those physical means with sufficient particularity to enable others to use the invention. But no particular "machine" is required. *Cochrane* v. *Deener*, 94 U.S. 780, 787-88 (1876) ("A process is a mode of treatment of certain materials to produce a given result. . . . [B]ut the tools to be used in doing this may be of secondary consequence."). In this respect, the error in the majority opinion lies not in its conclusion that the claims in petitioners' application are not patentable (they are not), but in its annunciation of the machine-or-transformation test as the alpha-and-omega of patent-eligibility. *Cf. KSR Int'l Co.* v. *Teleflex Inc.*, 550 U.S. 398, 418 (2007) ("Helpful insights … need not become rigid and mandatory formulas").[3]

Computer-implemented inventions are fundamentally and easily distinguishable from the hedging method claimed in petitioners' application using the patent-eligibility framework developed by this Court in precedents dating to the Nineteenth Century. To demonstrate that this Court's Industrial Age precedents are both appropriate and easily applicable to these modern technologies requires a brief discussion of the underlying architecture of digital machines and the real-world implementation of computer processes.

Despite the popular conception of the computer as a quintessentially modern technology, computers predate inventions such as the telephone and tele-

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[3] The historical cases focus on achieving a particular outcome or result. *See*, e.g., *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U.S. 245, 255 (1928) ("A patentable process is a method of treatment of certain materials to produce a particular result or product"); *Waxham* v. *Smith*, 294 U.S. 20, 22 (1935) ("By the use of materials in a particular manner he secured the performance of the function by a means which had never occurred in nature, and had not been anticipated by the prior art; this is a patentable method or process"). A useful result in the "real world" will necessarily involve a physical alteration or manipulation of matter, and (contrary to a suggestion made below, *see* Pet. App. 29a-30a) machines and processes that work with or communicate physically embodied information or data (such as clocks, compasses, thermometers, telephones, and so forth) have historically been considered patentable. That is entirely consistent with the historical standard, which revolves around whether the applicant has described a physical embodiment or implementation that is capable of producing a practical outcome or result.

graph, and date back to the age of steam power and brass gears. Charles Babbage's mechanical computers—the Difference Engine and the Analytical Engine—designed in the Nineteenth Century, were the forerunners of modern computing devices. Anthony Hyman, *Charles Babbage: Pioneer of the Computer* 164-66 (1982) (by 1836, Babbage "had sketched out many of the salient features of the modern computer"). Obviously, there have been enormous advances since the days of Babbage, with mechanical gears giving way initially to electromechanical relays and vacuum tubes, and more recently to semiconductor chips.

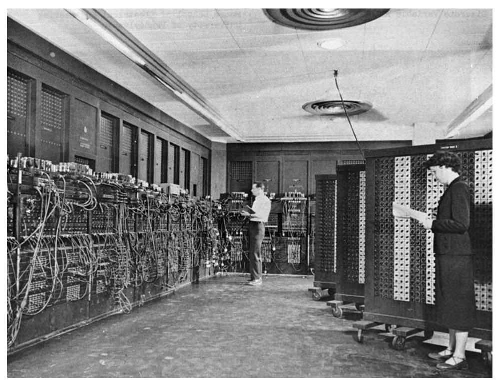
Today, the term "computer" often denotes the laptop or desktop device that many people use for word processing, e-mail, surfing the Internet, and other applications. While this usage of the term is of course correct, it captures only a little slice of the broad spectrum of computers in common use today. At the high-end, corporations, governments, and educational institutions employ supercomputers—either huge custom-built devices or specialized networks of smaller machines—to perform calculations of a complexity, and at a speed, nearly incomprehensible to the layperson. And at the low-end, small computers are built into (or comprise) a vast array of consumer devices, including digital televisions, cellular telephones, music players and other entertainment devices, videogame consoles, kitchen appliances, thermostats, and so forth. A current-generation automobile includes several computers, which control everything from the fuel-injection system to the antilock brakes; a modern "fly-by-wire" airplane is a highly sophisticated computing system; and the means of controlling traffic, both on land and in the air, depend on complicated computer networks. The list could go on and on. *See* IBM Br. 7, 19-21 (providing numerous examples of the expanding and essential contributions of computers).

The fantastic variety in which computers are now found can obscure the remarkable fact that every single one is, at its heart, a collection of tiny on-off switches—usually in the form of transistors. *See generally* David A. Patterson & John L. Hennessy, *Computer Organization and Design* (4th ed. 2009); Ron White, *How Computers Work* (8th ed. 2005). Just as the configuration of gears and shafts determined the functionality of Babbage's computers, it is the careful configuration of these on-off switches that produces the complex and varied functionality of modern computers.

Today, these on-off switches are usually found in pre-designed packages of transistors commonly known as "chips." Thin wafers of silicon, chips can contain many millions of transistors, connected to one another by conductive materials etched onto the chip like a web of telephone lines. They are organized such that they can be turned on or off in patterned fashion, and by this method, perform simple operations, such as turning *on* every transistor whose corresponding transistor is *off* in the neighboring group. From these building blocks, mathematical and logical operations are carried out. Patterson & Hennessy, *supra*, at 44-47 & App. C.

The challenge for the inventor is how to use these transistors (and applying the principles of logic, physics, electromagnetism, photonics, etc.) in a way that produces the desired functionality in a useful manner. Computer programming is an exercise in reductionism, as every feature, decision, and analysis must be broken down to the level of the rudimentary operations captured by transistors turning on and off. This reductionism is matched by the detail with which transistors must be configured and instructed to carry out the thousands or millions of operations required by the process.

Early electronic computers were "programmed" by laboriously rewiring their electrical pathways so that the computer would perform a desired function. ENIAC—the first general-purpose electronic digital computer, functioning at the midpoint of the Twentieth Century—could take days to program, with operators physically manipulating the switches and cables. Patterson & Hennessy, *supra*, at 1.10.



Fortunately, this is no longer the case. Transistors, packaged onto silicon chips, permit electronic manipulation of the pathways between them, allowing those pathways to be altered to implement different processes without direct physical manipulation. The instructions for this electronic reconfiguration are typically expressed in computer software. *See Microsoft Corp.* v. *AT&T Corp.*, 550 U.S. 437, 445-46 (2007) (noting that, *inter alia*, Windows software renders a general-purpose computer "capable of performing as the patented speech processor").

To allow more sophisticated control over the millions of transistors on a chip, inventors rely on a multi-layered scheme of pre-designed software "languages" that help bridge the gap between the on-off language of the transistor and the words and grammar of human understanding. These allow control of the transistors on a chip at various levels of specificity, ranging from "machine language," which allows transistor-level control, to "programming languages," which allow operations to be defined through formal syntax and semantics that are more easily understood by humans. Each language pre-packages the mathematical and logical operations that are most useful for the users of that particular language. *See* Patterson & Hennessy, *supra*, at 11-13, 20-21, 76-80.

Using these languages, the inventor can create "software" that defines the operations of semiconductor chips and other hardware. These operations are the steps of a computer-implemented process. The role of software is simply to automate the reconfiguration of the electronic pathways that was once done manually by the human operators of ENIAC.[4]

As with any patentable process, it is the real-world implementation—the actual acting out, or physical execution—of the process that makes it new and useful. In a computer-implemented process, the acting out consists primarily of the rapid activation and deactivation of millions of transistors to perform

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[4] As an aid to comprehension, the reconfiguration is often conceptualized as the computer "running" the software or "executing" the software instructions. In reality, however, when stored as electrical charges, the ones and zeros of the binary code produce electrical currents that literally (but temporarily) reconfigure the electronic pathways running between transistors in the same way that human operators reconfigured the wiring of ENIAC by hand.

some useful function, such as displaying images and solving problems. Such functions, implemented and made real, physical, and useful by the activity of transistors, are the inventor's actual process.

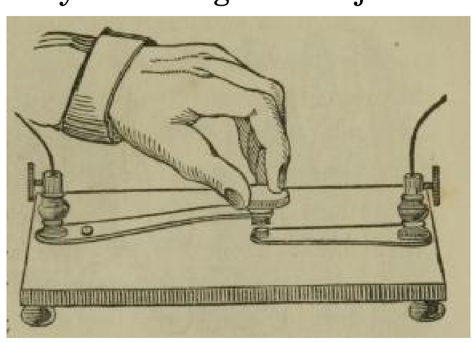
While the popular conception of "software" as something that is functionally distinct from "hardware" can be useful, it tends to obscure our understanding of the physical processes taking place within the computers all around us. This is reflected in the commonly used term "software patent," employed by petitioners. So-called "software patents" generally do not actually describe software at all, but rather the process performed by a programmed computer. It is such a computer-implemented process—not software itself—that is potentially eligible for patent protection. *See generally* Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7,478 (Feb. 28, 1996). For this reason, the notion of "software patents" as a category that is distinct from digital hardware patents lacks any coherent technological or legal basis.

Purporting to analyze the patent-eligibility of software, as opposed to that of hardware, relies on an illusory distinction. The functionality of any digital device is the product of the same transistor activity, and it is the configuration of the pathways between those transistors that dictates their functionality. Like all patent-eligible processes, computer-implemented processes *combine* physical activity with human-directed logic. Irrespective of whether a particular configuration of transistors is accomplished using a soldering iron or by means of software, the processes conducted by these transistors are ultimately physical processes. *Cf. Quanta Computer Inc.* v. *LG Elecs., Inc.*, 128 S. Ct. 2109, 2118 (2008).

It follows naturally from this understanding that the innovation that employs a computer to do new and useful things is not necessarily encompassed by the innovations of the transistor (or computer) itself—that is, a new way to use an existing computer may itself be patent-eligible. *See* 35 U.S.C. § 100(b) ("The term 'process' … includes a new use of a known process, machine, manufacture, composition of matter, or material"). Although the court below dismissed this statutory text as "unhelpful" (Pet. App. 7a n.3), it confirms that, among other things, each new application of computer technology (at heart, each new use of transistors) which permits computers to perform a useful function is the product of human innovation, the application of principles to the functions of human needs.

In this respect, modern computer-related inventions are no different from other patent-eligible innovations that have produced a new and useful result by employing physical structures and phenomena to record, manipulate, or disseminate information.

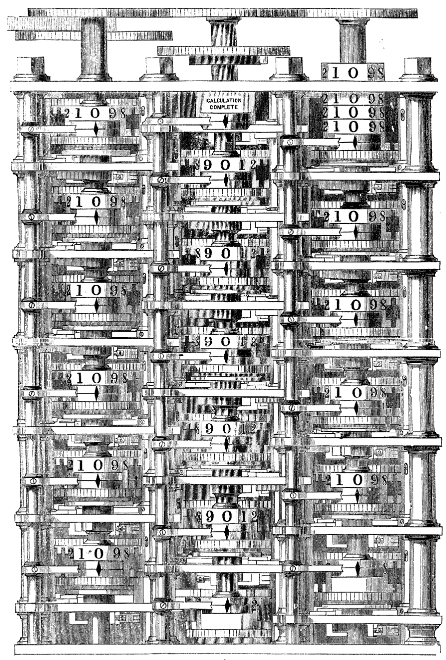
Perhaps the most celebrated example of such technological innovation is Samuel Morse's invention of the electric telegraph, which (like modern computers) employed binary encoding in conjunction with the sequential operation of switches. Although petitioners focus almost exclusively on the Court's rejection of his *eighth* claim (on which more below), the



Court allowed a number of other claims, including the fifth. *O'Reilly* v. *Morse*, 56 U.S. 62, 112 (1854). That claim was for "the system of signs, consisting of dots and spaces, and of dots, spaces and horizontal lines." *Id.* at 86. This system, an early version of Morse Code, was nothing other than a system for manipulating an on-off switch—the telegraph key—in a prescribed manner to produce the useful result of intelligible communications between two parties. Indeed, although much less complex, the telegraph system—a web of interconnected switches spreading around the globe, enabling binary-encoded communication—was comparable to the modern Internet.

The Industrial Age also knew software and hardware in a literal sense; the core concepts in computer design and programming were developed in this period. The principle of encoded instructions controlling a device found application at the opening of the Nineteenth Century, with the famous Jacquard loom, a device (still in use today) that adjusts the warp and weft of a textile in response to "programming" contained on punch cards. The loom's control apparatus consists of a series of on-off switches which are controlled by the pattern of holes punched in the cards, just as the pattern of microscopic pits and lands on the surface of a CD can be used to control the transistor switches inside a computer. Hyman, *supra*, at 166; Patterson & Hennessy, *supra*, at 24.

Inventors soon seized on the "programming" principle applied in the Jacquard loom. A defining characteristic of Babbage's Analytical Engine, for example, was the use of punch cards, adopted from the Jacquard loom, to store the programs run by the machine. "Following the introduction of punched cards early in 1836 four functional units familiar in the modern computer could soon be clearly distinguished: input/output system, mill, store, and control." Hyman, *supra*, at 166. Babbage's close friend, Ada Lovelace (the daughter of Lord Byron), is now recognized as "the first computer programmer" for her work developing software programs for the Analytical Engine. Nell Dale et al., *Programming and Problem Solving with C++* 406-407 (1997).



PORTION OF BABBAGE'S DIFFERENCE ENGINE.

Later in the Nineteenth Century, Herman Hollerith, a U.S. Census Office employee, developed a means of tabulating census results using punch cards and mechanical calculation. His method allowed the country to complete the 1890 census two years sooner and for five million dollars less than manual tabulation. William R. Aul, "Herman Hollerith: Data Processing Pioneer," *Think* 22-23 (Nov. 1972). The company he founded became the International Business Machines Corp., and the once-prevalent IBM punch-cards were both the direct descendent of the means used to program a Jacquard loom and the immediate predecessor to today's CDs and other media, which contain digitized instructions for modern computers to open and close millions of switches.

As has been often noted by historians of technological development, our perceptions of innovation and modernity are often misguided—the roots of technological change are deep, and run farther back in our history than we perceive. *See* Brian Winston, *Media Technology & Society: A History* 1 (1998) (arguing that current innovations in communications technology are "hyperbolised as a revolutionary train of events [but] can be seen as a far more evolutionary and less transforming process"). That is certainly true with respect to computer-related inventions. While the hardware and software implemented by a modern e-mail program may be orders of magnitude more complex than the dot-dash-dot of a telegraph key, the underlying physical activity that makes communication possible—the sequential operation of switches—is fundamentally the same.

II. From The Nineteenth Century To The Twenty-First: Processes That Involve Disclosed Physical Things Are Patent-Eligible

In a series of cases decided over the course of the Industrial Revolution, this Court gave content to the prohibition against patenting principles by allowing the patentability only of methods that involve disclosed physical things. Although we agree that that the Court should be hesitant to "link[] patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes" (Pet. App. 134a (Rader, J., dissenting)), we submit that those historical precedents retain their vitality, and relevance, today. Indeed, the doctrines laid down by the Court in the Nineteenth Century can resolve most if not all modern questions of patent-eligibility, including those involving computer-implemented process claims.[5]

The Court originally framed the core proscription thusly: "A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Le Roy*, 55 U.S. at 174-75. In the intervening century-and-a-half, the Court has articulated the proposition in varying ways, but the song remains the same: Such ephemera are "free to all men and reserved exclusively to none." *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

This prohibition against the patentability of principles is rooted in the plain text of the Patent Act, which (as pertinent here) authorizes patents only for inventions that are both "new" and "useful." 35 U.S.C. § 101 ("Whoever invents or discovers any *new and useful* process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the

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[5] In contrast, most of the briefs in this case focus on a bare handful of relatively recent opinions in which the Court considered patent-eligibility. *Diamond* v. *Diehr*, 450 U.S. 175 (1981); *Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980); *Parker* v. *Flook*, 437 U.S. 584 (1978); *Gottschalk* v. *Benson*, 409 U.S. 63 (1972). Since the Court already has been deluged with dozens of duplicative discussions of these decisions, we will not further address them, except to say that they did not overrule, nor do they require departure from, this Court's earlier precedents considering patent-eligibility.

conditions and requirements of this title") (emphasis added).[6]

Absent their novel application in the real world, principles are not "new" inventions. They, "like the heat of the sun, electricity, or the qualities of metals, are part of the storehouse of knowledge of all men.... He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes." *Funk Bros.*, 333 U.S. at 130. This inventiveness element is distinct from (and a prerequisite to) the novelty requirement imposed by Section 102, which is concerned with who *first* disclosed an invention that is otherwise patent-eligible.

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[6] In addition to subject-matter eligibility, the Patent Act imposes an array of other limitations on putative patent claims, which can serve as effective checks on attempts to evade the requirements of Section 101 through abusive claim drafting. *See* Novartis Br. 11-13. Section 102, which requires novelty, and Section 103, which requires non-obviousness over the prior art, buttress Section 101's prerequisite that the claimed invention be "new and useful." Sections 111 through 115 place requirements on the application, ensuring that any claims that survive the earlier analysis are fairly drawn against the actual invention. In addition to ensuring the proper disclosure of the innovation, these requirements buttress the requirements of the earlier sections. They—and the claim-drafting directives of Section 112, in particular—provide additional means by which courts can test assertions made in the claims and specification about the aspects of the invention that establish its patent-eligibility, novelty and non-obviousness. *See Morse*, 56 U.S. at 117-18 (noting that the claimant in *Le Roy* "was entitled to a patent for the new process or method in the art of making lead pipe, which this discovery enabled him to invent and employ; and *was bound to describe such process or method, fully, in his specification*") (emphasis added).

Disembodied principles in themselves also are not "useful" in the sense of Section 101.

> The basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point—where specific benefit exists in currently available form—there is insufficient justification for permitting an applicant to engross what may prove to be a broad field.

Brenner v. *Manson*, 383 U.S. 519, 534 (1966). Like the inventiveness element, the prerequisite of usefulness is separate from, and precedes, the "use" requirement imposed by Section 112 (first paragraph), which is concerned with the adequacy of disclosure of an invention that is otherwise patent-eligible.

This prohibition on patenting principles is of constitutional dimension. "Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available." *Graham* v. *John Deere Co.*, 383 U.S. 1, 6 (1966). Such a patent would not "promote the Progress of … useful Arts." Art. I, § 8, cl. 8; *see also Lab Corp. of Am. Holdings* v. *Metabolite Labs., Inc.*, 548 U.S. 124, 126-27 (2006) (Breyer, J., dissenting from dismissal of certiorari).

Physical things (devices, engines, etc.) often depend on principles, such as the laws of physics and thermodynamics, for their successful or efficient operation; but they are embodiments or instantiations of such principles rather than the principles themselves. *See*, *e.g.*, *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U.S. 45 (1923) (patented paper-making machine applied the principle of gravity to improve efficiency). In contrast, a process (or method) claims a series of steps for doing something, rather than the thing itself. Such a claim may well be patent-eligible (*see*, *e.g.*, *Cochrane*, 94 U.S. 780 at 787), but requires scrutiny to ensure that what is claimed is not merely an unpatentable abstract principle.[7]

The statutory and constitutional bases of patent-eligibility have been in place since the Founding. *See Graham*, 383 U.S. at 5-12. To be sure, Congress has enacted intellectual-property legislation in response to specific technological advances. *See*, *e.g.*, Plant Variety Protection Act of 1970, 7 U.S.C. §§ 2321-2582. But the Patent Act does not differentiate among the useful arts, and it certainly does not single out computer-related inventions for special treatment. Accordingly, the continued relevance of these basic precepts to patents claiming technologi-

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[7] Three of the statutory categories of patent-eligible subject-matter (machines, manufactures, and compositions of matter) are not before the Court in this case. This is important, because many computer-related inventions are comprised of, or include, product (machine or system) claims—and a programmed computer is itself a patent-eligible machine if it meets the other requirements for patentability. *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc). This dynamic is neither novel nor computer-specific. *See Leeds & Catlin Co.* v. *Victor Talking Mach. Co.*, 213 U.S. 301, 318 (1909) ("A process and an apparatus by which it is performed are distinct things. They may be found in one patent; they may be made the subject of different patents.").

cal advances is best understood by reference to an earlier period of transformational innovation.

At the dawn of the Industrial Age, this Court recognized both the patentability of processes and the challenge of distinguishing unpatentable "principles" from patent-eligible processes in a celebrated series of cases arising from that era's remarkable innovations in communication technology.

While the telegraph and wire-line telephone may seem commonplace, even archaic, in the light of modern computer and telecommunications innovations, the parallels, and continuity, between these historical innovations and those of our own age should not be underestimated. Nineteenth Century assessments certainly had a familiar ring of hyperbole. *See, e.g.,* Edward Highton, *The Electric Telegraph: Its History and Progress* 1-2 (1852) ("What an age of wonders is this! When one considers the state of Science a century ago, and compares the light of the past with that of the present day—how great is the change! how marvellous the advance! . . . Few inventions have created so great surprise and delight as that of the Electric Telegraph."); *id*. at 178 ("Time and space are all but annihilated. Years are converted into days, days into seconds, and miles have become mere fractions of an inch."). And modern scholars have often recognized the similarity, and continuity, between these Nineteenth Century innovations and those of the modern era. *See, e.g.*, Daniel Walker Howe, *What Hath God Wrought: The Transformation of America, 1815-1848* 1-2 (2007) (arguing that the telegraph "was destined to change the world," and that, together with the railroad, its "consequences certainly rivaled, and probably exceeded in importance, those of the revolutionary 'information highway' of our own lifetimes").

And, notably, the contemporaneous observations of this Court demonstrate that while inventions are always new, invention itself decidedly is not.

> The electric telegraph marks an epoch in the progress of time. In a little more than a quarter of a century it has changed the habits of business, and become one of the necessities of commerce. It is indispensable as a means of intercommunication, but especially is it so in commercial transactions.

Pensacola Tel. Co. v. *W. Union Tel. Co.*, 96 U.S. 1, 9-10 (1877). Today, "the Internet" could be substituted for "electric telegraph" and the Court's observations hold true in the Twenty-First Century.

Asked during this prior period of technological change to resolve the patent-eligibility of its pivotal inventions, this Court relied upon and refined the bedrock notion that principles are not patentable, but their useful applications may be. And it found that physical implementation—the use of disclosed physical means—defined the line separating principle from a practical application.

In one of the most famous cases defining this distinction between an unpatentable "principle" and a patent-eligible process, the Court limited its approval of Samuel Morse's patent to the physical method he had developed for telegraphy, described in the fifth claim and elsewhere, and excluded the underlying principle (as described in the eighth claim)—which, by itself, was not useful. "[Morse] has [discovered] a method by which intelligible marks or signs may be printed at a distance. And for the method or process thus discovered, he is entitled to a patent. But he has not discovered that the electro-magnetic current, used as motive power, in any other method, and with any other combination, will do as well." 56 U.S. at 117.

A generation later, considering Alexander Graham Bell's telephone patent, the Court repeated this distinction between principle and useful process. "[E]lectricity, left to itself, will not do what is wanted. The art consists in so controlling the force as to make it accomplish the purpose." *The Telephone Cases*, 126 U.S. 1, 532 (1888). And it drew the line even more finely than in *Morse*, approving Bell's patent not for a method tied to a working apparatus (indeed, Bell's actual device did not yet work when he applied for the patent (*id.* at 535)), but on the physical manner of manipulating electricity to render it capable of transmitting voice. "[Bell] found out that, by changing the intensity of a continuous current so as to make it correspond exactly with the changes in the density of air caused by sonorous vibrations, vocal and other sounds could be transmitted and heard at a distance. This was the thing to be done, and Bell discovered the way of doing it." *Id.* at 538-39. "Bell's patent is not alone for the particular apparatus he describes, but for the process that apparatus was designed to bring into use." *Id*. at 540.

The telling difference between the claims before the Court in these seminal cases was that Bell's eligible claimed process described the manipulation of a physical thing, an electrical current, which made it useful, while Morse's ineligible eighth claim stopped short of that essential inventive contribution. Bell's claim specifically described a *method* for using electric current for transmitting speech that operated on a physical thing, the electric current: "by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds." 126 U.S. at 531. This was a substantial step forward in the art, as the Court explained, an innovation that had not occurred to Bell's many competitors. *Id*. at 540-41. Morse's ineligible claim, by contrast, provided no such physical implementation, and merely described the abstract principle of using electrical current to write at a distance: "[T]he essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distances." 56 U.S. at 112. Bell's claim consisted of an operative, physical process, while Morse's described only the objective of an unspecified process.

Indeed, this theme runs throughout the Court's leading precedents.

In *Le Roy*, the Court did not ultimately rule on the eligibility of the patent claim, but its language clearly indicated that it expected that a physically implemented process would satisfy Section 101. *See* 55 U.S. at 175-76. And the critical issue in the English case that so interested this Court in *Le Roy* (and for years thereafter) was that the inventor had designed a physical manner of injecting hot air into a furnace, and was not merely seeking to patent the principle that so doing would increase a furnace's power. *Id.* (discussing *Househill Co.* v. *Neilson*, 151 ER 1266 (1841)). Seven years later, when the lawsuit in *Le Roy* returned to the Court on a related question, the Court was even more express about the role that physical embodiment could play in patent eligibility.

> However brilliant the discovery of the new principle may be, to make it useful it must be applied to some practical purpose. . . . "There can be no patent for a principle; but for a principle so far embodied and connected with corporeal substances as to be in a condition to act and to produce effects in any trade, mystery, or manual occupation, there may be a patent."

Le Roy v. *Tatham*, 63 U.S. 132, 137 (1859) (quoting Alderson B. Webster's Patent Cases, 683) ("*Le Roy II*").

These cases teach that physical implementation of a principle in a useful manner addresses (and, in most if not all cases, resolves) the prohibition against patenting principles, which inheres in Section 101. The added complexity of the court of appeals' "machine-or-transformation" formulation does not improve on this Court's clearer understanding: a process that makes use of a disclosed physical thing, and produces a measurable result in the physical world, does something more than describe an unpatentable principle—it is an application of that principle.

To be patent-eligible, therefore, a claimed method must involve one or more *disclosed physical things*—that is, it must describe a series of steps that use physical means to produce a result or effect in the physical world.

Indeed, this standard (and not "machine-or-transformation") has been the law for more than a century. *See Tilghman*, 102 U.S. at 727 ("Whoever discovers that a certain useful result will be produced, in any art [*i.e.*, process], machine, manufacture, or composition of matter, *by the use of certain means*, is entitled to a patent for it") (emphasis added). As explained in a Nineteenth Century treatise, the patentee must describe "a practical application to some useful purpose . . . and his specification must show the application of the principle to such a special purpose, by its *incorporation with matter* in such a way as to be in a condition to produce a practical result." George Ticknor Curtis, *A Treatise on the Law of Patents for Useful Inventions as Enacted and Administered in the United States of America* § 242 (4th ed. 1873) (emphasis added). The author explains that "wherever a claim does in truth sever the use of a motive-power or other elemental agency from all conditions of its application in the arts, and presents *it only* as a *causa causans* of a result, it is void; because some practical means of producing the result is the necessary link between cause and effect." *Id.* at § 160 (emphasis in original). Thus, while a disembodied principle is unpatentable, "a principle or function *embodied in a particular organization of matter* for a particular purpose . . . is patentable." *Id.* at § 242 (emphasis added).

This standard should suffice for the next 100 years as well. This Court has consistently grounded its patent jurisprudence in historical context, properly declining invitations to abandon long-standing doctrines even in the face of technological change. *Microsoft*, 550 U.S. at 444 (relying on *Brown* v. *Duchesne*, 60 U.S. 183 (1857)); *see also*, *e.g.*, *Pfaff* v. *Wells Elecs., Inc*., 525 U.S. 55, 62 (1998) (applying "the reasoning of *The Telephone Cases* to the facts of the case before us today," which involved the application of the on-sale bar in a case involving computer chip socket design); *Bonito Boats Inc.* v. *Thunder Craft Boats Inc.*, 489 U.S. 141, 149-152 (1989) (relying on *Pennock* v. *Dialogue*, 2 Pet. 1 (1829), and other early cases).

Technological innovation has been transforming the Nation since the Founding, and continued advances today (and in the future) only confirm the relevance of this Court's historical case law. As this Court observed over 130 years ago, the powers granted by the Constitution "extend from the horse with its rider to the stage-coach, from the sailing-vessel to the steamboat, from the coach and the steamboat to the railroad, and from the railroad to the telegraph." *Pensacola Tel.*, 96 U.S. at 9. The parallel chains of continuity that connect both technology and law across the eras of our history teach that the Court's observation can and should be updated: "and from the telegraph through the telephone, to the Internet, and beyond."

To reiterate (and conclude), this Court has long recognized that a patent-eligible method must involve one or more *disclosed physical things*—that is, it must describe a series of steps that use physical means to produce a result or effect in the physical world. This test for patent-eligibility has withstood the test of time, and it is sufficiently flexible to accommodate technological advances. The inflexible machine-or-transformation test, in contrast, is not compelled by this Court's historical precedents. Indeed, the older cases cited by the government (*see* U.S. Br. 29-30) are far more consistent with the standard proposed by this brief than the government's alternative formulation.

Computer-implemented process claims, in general, will meet the standard historically employed by this Court, which should be retained and reaffirmed. In contrast, because the hedging method described in petitioners' application is not sufficiently "embodied and connected with corporeal substances" (*Le Roy II*, 63 U.S. at 137), it is not patent-eligible under Section 101.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

HORACIO E. GUTIÉRREZ
T. ANDREW CULBERT
MICROSOFT CORPORATION
INTELLECTUAL PROPERTY
& LICENSING
One Microsoft Way
Redmond, WA 98052
(425) 882-8080

MARK A. PERRY
Counsel of Record
MATTHEW D. MCGILL
JASON B. STAVERS
GIBSON, DUNN &
CRUTCHER LLP
1050 Connecticut
Avenue N.W.
Washington, D.C. 20036
(202) 955-8500

Counsel for Microsoft Corporation

JACK E. HAKEN
KEVIN C. ECKER
LAURIE GATHMAN
TODD HOLMBO
PHILIPS INTELLECTUAL
PROPERTY & STANDARDS
345 Scarborough Road
Briarcliff Manor,
NY 10510
(914) 945-6000

Counsel for Koninklijke Philips Electronics N.V.

JOSEPH T. FITZGERALD
SYMANTEC CORPORATION
LEGAL & PUBLIC AFFAIRS
350 Ellis Street, Bldg. A
Mountain View, CA 94043
(650) 527-2733

Counsel for Symantec Corporation

October 2, 2009