No. 08-964

In the Supreme Court of the United States

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

JOHN J. DOLL
Respondent.

On Writ of Certiorari to The United States Court of Appeals For the Federal Circuit

BRIEF OF *AMICUS CURIAE* YAHOO! INC. IN SUPPORT OF NEITHER PARTY

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QUESTION PRESENTED

Section 101 of the Patent Act makes "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" patent-eligible. The question presented is whether the Federal Circuit erred by holding that the "definitive test" for determining whether a process claim is patent-eligible is whether "it is tied to a particular machine or apparatus" or "it transforms a particular article into a different state or thing."

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INTEREST OF AMICUS CURIAE[1]

Yahoo! Inc. ("Yahoo!") provides services to more than 500 million individuals each month worldwide and operates one of the world's most popular Internet destinations. The company is a leading innovator in the computing and Internet sectors, holds many patents relating to Internet communication, and also licenses a variety of technology patents both to and from third parties. From time to time, Yahoo! finds it necessary to enforce its own patent rights as well as to defend itself against allegations that it infringed a third party's patent. Accordingly, Yahoo!'s interest is in a balanced and efficient patent system that fairly rewards innovation.

INTRODUCTION AND SUMMARY OF ARGUMENT

The rule announced by the Federal Circuit in this case, under which a "process" is patent-eligible only if it is tied to a particular machine or transforms a physical article into a different state or thing, is both conceptually and practically flawed. Moreover, the test represents a misreading of this Court's precedents. Yahoo! urges the Court to restore an understanding of 35 U.S.C. §101 that is faithful to the broad language of the provision and consistent

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[1] Counsel for both parties have consented to the filing of this brief, and their consents have been filed with the Clerk of this Court. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amicus curiae* or its counsel made a monetary contribution to its preparation or submission.

with the purposes of the patent system. That requires a test designed to identify the limited exceptions to patent eligibility rather than one that interposes an unwarranted obstacle to patentability for a vast array of modern innovations. Notably, however, Yahoo! supports neither party in this case. Although the Federal Circuit erred in adopting the machine-or-transformation test, Bilski's process claim is not patent-eligible under a proper reading of §101.

The language of §101 is sweeping, encompassing "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." "Process" is defined broadly to mean "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. §100(b). But while §101 is broadly written, the conclusion that a claim is patent-eligible under that provision does not mean that a patent should issue—35 U.S.C. §§102 and 103, for instance, establish important limitations relating to novelty and non-obviousness.

This Court has recognized two related reasons for limiting the broad language of §101. First, "laws of nature, natural phenomena, and abstract ideas," *Diamond v. Diehr*, 450 U.S. 175, 185 (1981), are not patentable because everyone is entitled to share in what the Court has described as "fundamental truth[s]" of the natural world. *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852). Relatedly, the Court has explained that as a practical matter permitting excessively broad patents would undermine the

purposes of the Patent Act by preempting future innovations. *Id*.

The machine-or-transformation test does not adequately reflect either the statutory language or these underlying principles governing patentability. As to the former, neither the ordinary meaning nor the statutory definition of the word "process" limits the term to processes tied to machines or to physical transformations. To the contrary, Congress's separate listing of "process" and "machine" supports the conclusion that they are separate, so that a process need not be tied to a particular machine. Similarly, the language relating to a new "process" is listed separately from the language relating to a new "composition of matter," supporting the conclusion that a new process need not transform matter to a new state. As to the latter, cases decided since the decision below illustrate that with respect to the cutting-edge issues of today, the test focuses attention on questions irrelevant to the statute's fundamental purpose of rewarding innovation. In practice, the machine-or-transformation test elevates form over substance and permits the limited exceptions to §101 eligibility to swallow the general rule.

At the Federal Circuit, Yahoo! urged the court to reject the machine-or-transformation test and to instead build upon *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, which found that a process is patent-eligible only if it produces a "useful, concrete[,] and tangible result." 149 F.3d 1368, 1373 (Fed. Cir. 1998) (quoting *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994). Notably, however, while the fact that a process leads to such a result will often

distinguish the claimed invention from a natural law or abstract idea, the *State Street* test is overinclusive. To be patent-eligible under §101, a process must *also* be circumscribed in scope, limited by clearly defined steps that are stable, predictable, and reproducible—*i.e.*, it must be "machine-like." This latter requirement captures the insight of industrial-era cases that a patent-eligible process is not just any series of steps, but should be limited to a *specific* series of steps so as not to "preempt" other ways to accomplish the same result.

This case illustrates why the analysis we propose is superior to the "machine-or-transformation" test. The problem with Bilski's patent claim is not that it fails to involve a machine or a physical transformation. The problem is that it essentially attempts to patent the *idea* of hedging, at least with respect to commodities trading, and fails to propose a specific process for hedging. If Bilski had developed a process that, in machine-like fashion, directed commodities traders to take a clearly defined series of steps to hedge their position, that process might lead to useful, concrete, and tangible results. In addition, a patent for such a specific process would not broadly preempt other methods of hedging, so it would not foreclose innovators from developing superior hedging processes. But Bilski does not claim a specific series of steps that are stable, predictable, and reproducible—and that failure, rather than the absence of a machine or a physical transformation, is why his claims should not be patent-eligible.

ARGUMENT

I. THE FEDERAL CIRCUIT'S MACHINE-OR-TRANSFORMATION TEST IS BOTH CONCEPTUALLY AND PRACTICALLY FLAWED.

At the heart of this case is the question of how to distinguish processes that should qualify as patent-eligible subject matter under Section 101 of the Patent Act from those that should not. The Federal Circuit found that question can be answered by focusing exclusively on whether the claimed invention is "tied to a particular machine or apparatus" or "transforms a particular article into a different state or thing"—the "machine-or-transformation test." *In re Bilski*, 545 F.3d 945, 954-55 (Fed. Cir. 2008). The Federal Circuit was wrong. While *Bilski*'s machine-or-transformation test was (and remains) a useful proxy for the principles that distinguish the patentable from the unpatentable in the context of Industrial Age devices and processes, it is ill-suited to perform that task in the context of today's advanced technologies.

A. The Machine-or-Transformation Test Is Conceptually Flawed Because a Patent-Eligibility Standard Focusing Solely on Physicality Requirements Is Ill-Adapted to Today's Technologies.

The machine-or-transformation test was developed in the context of claims for traditional electro-mechanical devices and manufacturing processes. It is an essentially backward-looking test, limiting patent eligibility today to the kinds of things for which patents were issued years, decades, or even

centuries ago. But the patent system is fundamentally about *advances* in technology, about *tomorrow's* innovations, and a test limiting patent eligibility to *yesterday's* technologies makes little sense.

While a system of precedent is necessarily somewhat backward-looking, this Court must take care to ensure that its precedents are not applied to prevent the law (and especially the forward-looking law of patents) from keeping pace with changes in the world in which we live. In adopting the machine-or-transformation language from this Court's decision in *Gottschalk v. Benson* as the "definitive test" for patentability, *Bilski*, 545 F.3d at 954, the Federal Circuit ignored this Court's admonition to avoid "freez[ing] process patents to old technologies, leaving no room for the revelations of the new, onrushing technology." *Benson*, 409 U.S. 63, 71 (1972).

Indeed, *Benson* itself expressly *rejected* the claim that the machine-or-transformation test applies is necessarily exhaustive:

> It is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a "different state or thing." We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.

Id. Several years later, the Court made the same point in *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978):

> An argument can be made … that this Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a "different state or thing." [Citation omitted.] As in *Benson*, we assume that a valid process patent may issue even if it does not meet one of these qualifications of our earlier precedents.

Similarly, while this Court's most recent decision addressing the scope of patentable subject matter, *Diamond v. Diehr*, 450 U.S. 175 (1981), provided "transforming or reducing an article to a different state or thing," *id.* at 192, as *examples* of patentable functions, it did not impose any rigid formula *limiting* patentability to such circumstances. Taken together, this Court's precedents leave no doubt that patent eligibility analysis under §101 must be flexible enough to take account of "new, onrushing technology."

The machine-or-transformation test lacks that flexibility. At a time when many of society's most significant technological advances involve electronic signals and magnetic impulses, the inquiry into whether there has been a change of tangible materials to a "different state or thing" is no longer exhaustive. Similarly, in the realm of computer-executed processes, the line between a "machine" and a "process" is indistinct at best. Technically skilled persons can implement a series of functions in either "hardware" (*e.g.*, logic circuits embedded on a microchip) or "software" (*e.g.*, instructions to be

executed by a computer). Accordingly, as a conceptual matter, whether a process is tied to a particular machine or results in the transformation of matter no longer reveals whether the process "as a whole" is "performing a function which the patent laws were designed to protect." *Id*.

A concrete example illustrates this conceptual failing. Much of the popular music to which consumers listen today is heard in "MP3" format. MP3 is a standard for compressing digital audio files—a compression algorithm based on characteristics of human hearing that removes approximately 90% of the data from digital music files without substantially affecting humans' perception of the reproduced sound. The MP3 algorithm can be thought of as a complex mathematical formula with a specific application. But it does not result in any "physical" transformation—only the digital data are altered. Nor is it "tied" to any "particular" machine—indeed, while a "particular" machine could certainly be built to run the algorithm, one of its chief benefits is that it may be run on any "general purpose" computer. The process may, in other words, be instantiated in either software or hardware. Few would doubt that this is the kind of technological advance meriting patent protection and, in fact, the PTO issued a patent for MP3 technology. *See* U.S. Patent No. 5,579,430 (filed Jan. 26, 1995 with a priority date of Apr. 17, 1989). But this innovation would not appear to be patentable under a strict interpretation of the machine-or-transformation test.

B. The Machine-or-Transformation Test Is Difficult to Apply, Incompletely Captures the Policies Underlying the Patent Act, and Threatens to Destabilize Previously Settled Areas of Law.

The cases—both judicial and administrative—attempting to apply the machine-or-transformation test since the Federal Circuit's decision in this case demonstrate that the test fails to address the real question of whether an invention *should* be patent-eligible. Moreover, because the Federal Circuit's reasoning cannot be confined to "process" patents, the problems with the machine-or-transformation test are already affecting other areas of patent law as well.

The Federal Circuit has decided two §101 cases since its *Bilski* decision, and both highlight problems with the machine-or-transformation test. In *In re Ferguson*, 558 F.3d 1359, 1361 (Fed. Cir. 2009), the panel unanimously agreed that process claims for "[a] method of marketing a product" by sharing a marketing force for different "products that are made by a plurality of different autonomous producing compan[ies]" were not patent-eligible.

Judge Newman's concurrence, however, foreshadowed the difficulty of applying a test tied to physicality requirements in the context of computer-implemented processes. She noted that, on one hand, the *Bilski* court had rejected the "useful, concrete, and tangible" test of *State Street* and required that patent-eligible claims must be tied to a "particular" machine if they do not involve a transformation of matter. On the other hand, Judge Newman observed, the *en banc* court had not overruled *State Street* but

had instead found that the portfolio management process at issue there was "performed by a computer, thus meeting the *Bilski* test." *Ferguson*, 558 F.3d at 1367. Judge Newman plainly doubted whether a test that requires a tie to a "particular machine" but yet finds that requirement may be satisfied when a process is "performed by [a] computer" provides sufficient guidance to the PTO and other courts.

The Federal Circuit's second and most recent post-*Bilski* patentability decision, *In re Comiskey*, was first decided in 2007 but reconsidered by the original panel in 2009 in light of *Bilski*. The applicant advanced both "method" (Claim 1) and "system" (Claim 17) claims for "mandatory arbitration resolution regarding one or more unilateral [legal] documents" such as wills or contracts. *Comiskey*, 554 F.3d 967, 970 (Fed. Cir. 2009). The "method" described by Claim 1 called for the document and its author to be "enroll[ed] … in a mandatory arbitration system"; for mandatory arbitration language to be incorporated into the document; for parties wishing to challenge the document to submit a request for arbitration; and for the dispute to be arbitrated and subject to a final award or decision. *Id*. The "system" described by Claim 17 was nearly identical, except that it called for the use of several "module[s]," including a "registration module" for enrolling a person and an "arbitration module" for incorporating arbitration language into the unilateral document. *Id*. at 971. In addition, four dependent claims explicitly required the use of a computer or other machine to establish "access to the mandatory arbitration … through the Internet, intranet, World Wide Web … or other communication means." *Id*. at 981.

On reconsideration, the *Comiskey* court found that the process claims were unpatentable because they "do not require a machine, and … do not describe a process of manufacture or a process for the alteration of a composition of matter." *Id.* In contrast, however, the court found that Claim 17's recitation of "modules," together with the dependent claims' reference to "access to the mandatory arbitration" via the Internet or other communications means, "could require the use of a machine as part of Comiskey's arbitration system." *Id.*

Dissenting from the denial of rehearing *en banc*, Judge Newman wrote that *Comiskey*'s "Section 101 split between [the] method and system claims does not conform with any relevant statute or advance any known policy." 2009 U.S. App. LEXIS 400, *44 (Fed. Cir. 2009). She argued that if "these steps are viewed as 'abstractions'" under *Bilski*, then "so simple a drafting gambit as reciting in the claims that a computer or other device (a calculator? an abacus?) may be used" should not change that fact. *Id.* According to Judge Newman, "[i]f the replacement of 'process' with 'system' or 'module' … suffices to provide *Bilski*'s 'meaningful limits' under Section 101, we should be explicit." *Id.* at *45. Plainly, however, Judge Newman believed that the Federal Circuit's *Bilski* decision should instead be revisited.

Recent decisions of the Board of Patent Appeals and Interferences ("BPAI") cast further doubt on the distinctions drawn by the machine-or-transformation test. In *Ex parte Nawathe*, No. 2007-3360 (BPAI Feb. 9, 2009), for example, the application claimed a

method and system for "inputting multiple extensible Markup Language (XML) documents; creating a data representation of said multiple XML documents; and reducing redundancy across said multiple XML documents via a fixed set of tables." Slip op. at 2. Claims 1 and 16 recited a "computerized method" comprising these steps, while Claim 25 claimed an "apparatus" for performing the steps. *Id.* at 8-9. The BPAI reasoned that the "computerized recitation" of Claims 1 and 16 recited "a general purpose processor … as opposed to a particular computer specifically programmed for executing the steps of the claimed method." *Id.* at 8. Accordingly, "under the machine-or-transformation test, the claimed method fails to recite a *particular* machine." *Id.* (emphasis added). As to Claim 25, however, the BPAI found that "since the claim recites a physical apparatus with physical modules" for performing the steps of the process, the claim "is not … directed to an abstract idea." *Id.* at 9. *Nawathe* thus holds that a computerized process executed by a "general purpose" machine is not patent eligible, but an "apparatus" executing the same process is. The BPAI did not explain how or why this distinction flows from the language of the Patent Act or advances its purposes.

In *Ex parte Gutta*, No. 2008-3000 (BPAI Jan. 15, 2009), the claims were directed to a "computerized method performed by a data processor" that made recommendations to a consumer by comparing the consumer's user history to that of a third party in a specific, automated way, importing aspects of the third party's user history and displaying the resulting recommendations to the consumer. Slip op. at 2. The BPAI rejected this process claim because,

under *Bilski*, "the use of a specific machine must impose meaningful limits on the claim's scope to impart patent-eligibility." *Id.* at 5. Neither the use of a "data processor" nor the "displaying" of results was sufficient "to impart patentability to a claim involving the solving of a mathematical algorithm." *Id*. *Gutta* is consistent with *Nawathe* in that a computerized process was again found unpatentable in the absence of a "particular" machine. But it is difficult to see how the application of *Gutta*'s unique "mathematical algorithm" to produce specific recommendations could be considered an "abstract idea," and harder still to see why the application should be considered any *more* patentable if the applicant were to promise to instantiate the claimed process in an "apparatus."

The question from Judge Newman's *Comiskey* dissent—whether it makes sense to treat "process" and "system" claims describing the same invention differently—also arises in recent BPAI decisions. Moreover, a related question exists with respect to so-called "*Beauregard* claims," named after the Federal Circuit's decision in *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995). *Beauregard* claims recite a computer-readable storage medium (*e.g.*, a hard drive, CD, or DVD) containing a set of instructions that causes a computer to perform a process. While such claims were once considered unpatentable, *Beauregard*'s rule that computer programs contained on computer-readable media *are* patentable has now been in place for nearly 15 years. Recent BPAI decisions suggest that whether an invention is claimed as a process (a series of steps for reaching a result), a system (the same steps performed by a computer), or a *Beauregard* claim (the same set of

steps recorded on a computer-readable medium) may be outcome-determinative under §101.

In *Ex Parte Atkin*, No. 2008-4352, 2009 Pat. App. LEXIS 1 (BPAI Jan. 30, 2009), the claims described a method for "converting a unidirectional domain name to a bidirectional domain name," so that Internet domain names could be displayed in a way that is more meaningful in languages with non-English reading orders, such as Hebrew (which is bi-directional). *Id.* at *13. The claims recited specific, automated steps for breaking the English domain name into "a plurality of individual labels," evaluating each label for proper bidirectional display order, and reordering the characters appropriately. *Id.* at *7. Claim 1 set forth the invention as a process claim; Claim 5 recited a "computer readable medium encoded with computer software for accomplishing" the steps of the method claim; and Claim 9 recited a "system" including a "label definer" to break the name into labels, an "inferencer" to establish the proper direction within labels, and a "character reorderer"—presumably all software "modules"—to produce the display order. *Id.* at *15-19. The BPAI rejected Claim 1 because it did not "recite any machine or apparatus or call for transforming an article into a different state or thing." *Id.* at *18. Similarly, the Board rejected Claim 9 because neither the "system" label nor the terms "label definer," "inference," and "character reorderer" necessarily "impl[ied] the presence of any apparatus." *Id.* at *19-20. The BPAI, however, left "it to the Examiner to determine in the first instance whether [c]laim 5"—the *Beauregard* claim—"recite[s]

patent eligible subject matter." *Id.* at *22 n.8.[2] *Atkin* thus suggests that the same basic invention is not patentable when claimed as a process (a series of steps) or as a system (a series of steps performed by a computer) but may be patentable when made as a *Beauregard* claim (a series of steps recorded on a computer-readable medium). And, of course, consistent with *Nawathe*, the same series of steps would presumably be patent-eligible were the inventor to promise to instantiate them in an "apparatus."[3]

A recent district court case, *Cybersource Corp. v. Retail Decisions, Inc.*, 2009 U.S. Dist. LEXIS 26056 (N.D. Cal. Mar. 26, 2009), rejects the BPAI's emphasis on the form in which an invention is claimed but still manages to add to the analytical confusion. Plaintiff Cybersource sought to enforce its patent on an automated process for detecting fraud in an online credit card transaction. The process involved using the Internet to obtain information about other transactions initiated from the same Internet address and then "verifying the credit card information based upon the values of [a] plurality of parameters," wherein "each value among the

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[2] Other post-*Bilski* decisions of the BPAI have generally found that *Beauregard* claims *are* patent-eligible. *See, e.g., Ex Parte Mazzara*, No. 2008-4741, 2009 WL 291178 (BPAI Feb. 5, 2009) ("computer-usable medium" containing software was patent-eligible); *Ex Parte Van Beek*, No. 2008-2033, 2009 Pat. App. LEXIS 5, *1, 7 (BPAI Jan 16, 2009) ("computer-readable medium" containing a "file format" for storing a specific kind of data was patent-eligible).

[3] The Board reached similar results in *Ex parte Giacchetti*, No. 2008-2866 (BPAI Mar. 11, 2009), and *Ex parte Bo Li*, No. 2008-1213, 2008 Pat. App. LEXIS 27 (BPAI Nov. 6, 2008).

plurality of parameters is weighted in the verifying step according to an importance, as determined by the merchant, of that value to the credit card transaction." *Id.* at *2-3. Claim 2 described the invention as a process, while Claim 3 invoked *Beauregard* by reciting a "computer-readable medium containing program instructions" for implementing the same process. *Id.* at *2. The court found that there was no "transformation" because "the claimed methods simply obtain and compare intangible data." *Id.* at *9. And while the invention certainly used the Internet, the Internet is not a "particular machine" within the meaning of the machine-or-transformation test. *Id.* at *20-24. Finally, the court disparaged *Beauregard* on the grounds that it "was not a decision on the merits of patentability," found that there "is at present no legal doctrine creating a special '*Beauregard* claim,'" for computer programs embedded in tangible media, and concluded that Claim 3 (like Claim 2) failed the "machine-or-transformation test for patent eligibility." *Id.* at *28-31. *Cybersource* thus cast a shadow over *Beauregard* claims but offered no analysis whatsoever of whether an automated process for detecting credit card fraud online *should* be patentable.

Returning to our earlier example of the MP3 algorithm, the BPAI cases indicate that the method itself would not be patentable, no more than the recommendations algorithm of *Gutta*. Decisions like *Nawathe* suggest that that an MP3 "system" reciting a "general purpose computer" likewise would not be patentable. On the other hand, a *Beauregard* claim reciting the process on a computer-readable medium *might* be patentable under BPAI precedent, although

Cybersource raises grave doubts on that issue. Of course, an "apparatus" dedicated to repeatedly implementing the MP3 algorithm would have the highest likelihood of being found patent-eligible.

Sometimes it is best to acknowledge that the emperor has no clothes. These distinctions make no sense, and they therefore cannot provide the consistency, stability, and predictability that Congress and this Court have found so critical in the area of patent law. *See, e.g., Fla. Prepaid Postsecondary Educ. Expense Bd. v. Coll. Sav. Bank*, 527 U.S. 627, 651 (1999) (noting that the need to "ensure consistency in the substantive application of the patent law" motivated Congress to take the unusual step of creating the Federal Circuit). This Court should refocus the test for patentability on the language and purposes of the Patent Act, and provide guidance capable of being consistently applied to today's high-tech innovations.

II. THE PLAIN LANGUAGE OF THE PATENT ACT IS BROAD, AND THIS COURT HAS PROPERLY FOUND FEW REASONS SUFFICIENT TO JUSTIFY EXEMPTIONS FROM THAT LANGUAGE.

The discussion above shows that the machine-or-transformation test set forth by the decision below is not working. The focus of this section is understanding why it is not working. In short, the Federal Circuit adopted its test purporting to provide guidance for *how* to distinguish patentable from unpatentable subject matter without considering *why* we make that distinction. That is putting the cart before the horse. An appropriate and effective

test for patentability must reflect the language and purposes of the Act.

A. This Court's Cases Have Found the Scope of the Patent Act to be Broad but Not Unlimited.

The language of §101 sweepingly authorizes patents for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. §101. The Act's definition of "process" is likewise broad, defining the term somewhat circularly as a "process, art or method, and [the term] includes a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. §100(b).

Section 101 is thus inclusive on its face, and this Court has "more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed." *Diehr*, 450 U.S. at 182 (internal quotation and citation omitted). The Court has found that Congress intended statutory subject matter to be expansive, including "anything under the sun that is made by man." *Id.* (internal quotation and citation omitted).

At the same time, however, this Court's precedents make clear that §101 is not without limits. In particular, as relevant here, the Court has held that not every process "in the ordinary sense of the word" is patentable. *See Flook*, 437 U.S. at 588-89. The proper question under §101 is "whether the method described and claimed is a 'process' *within the meaning of the Patent Act*." *Benson*, 409 U.S. at 64 (emphasis added). In other words, some functions that are literally "processes" in the everyday sense of

the word are not patent-eligible because they are not processes "within the meaning of the Patent Act." The hard question, of course, is how to distinguish processes that qualify under the Act from those that do not. Again, answering the question "how" to distinguish patent-eligible inventions from unpatentable subject matter depends on the antecedent question "why" some things should be patentable and some should not. Any reexamination of the machine-or-transformation test must accordingly analyze the fundamental reasons why some things are patentable and some things are not.

B. This Court has Identified Two Fundamental Reasons for Excluding Subject Matter from the Scope of Section 101.

More than 150 years ago, in *Le Roy*, 55 U.S. at 175, this Court first expressly held that "a principle is not patentable." More importantly, however, the *Le Roy* Court provided two reasons *why* a principle should not be patentable. First, the Court explained that "in the abstract" a principle "is a fundamental truth; an original cause, a motive" as to which "*no one can claim … an exclusive right*." *Id.* (emphasis added). In other words, the Court found that some things cannot be patented because *everyone* is entitled to share freely in the "fundamental truths" of the natural world. Second, the Court wrote that as a practical matter patents on broad principles should not issue because such "monopolies" would only "discourage arts and manufactures, against the avowed policy of the patent laws." *Id.* In short, people should not be able to patent inventions—or

"principles"—that are so broad that they leave insufficient room for others to innovate.

Later cases reiterated these reasons for limiting §101. For example, in *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948), the Court held that "patents cannot issue for the discovery of the phenomena of nature." The Court explained that "the manifestations of the laws of nature" are "free to all men and reserved exclusively to none." *Id.* As a result, "[h]e who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes." *Id.* Thus, "Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are manifestations of … nature" to which everyone should have access. *See Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

The most famous elaboration of *Le Roy*'s second insight—that overbroad claims are not patent-eligible—came only two years later, in *O'Reilly v. Morse*, 56 U.S. 62 (1854). *Morse* approved an application for a patent on the process of using electromagnetism to send telegraph messages. But the Court rejected Claim 8, which claimed the use of "electro magnetism, however developed for marking or printing intelligible characters, signs or letters at any distances." *Id.* The Court reasoned that the claim was too broad—a future inventor could discover a different "method of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process" in Morse's claims, and yet "the inventor could not use it nor the public have the benefit of it" without Morse's permission. *Id.* at 113. *Morse* thus recognized that

the patentability of an idea declines as its breadth increases—broad patents impose higher costs on society than narrow ones because they inhibit future innovation, and patents should not issue when the costs outweigh the benefits.[4] In the more than 150 years since *Morse*, this Court has repeatedly reaffirmed this fundamental point: The patent system "reflects a balance between the need to encourage innovation and the avoidance of monopolies which stifle competition without a concomitant advance in the 'Progress of Science and useful Arts.'" *Bonito Boats Inc. v. Thunder Craft Boats*, 489 U.S. 141, 146 (1989).

C. The Court's Modern Cases Addressing Processes Reflect the Limitations Discussed Above.

Among this Court's modern trilogy of process-eligibility cases—*Gottschalk v. Benson*, *Parker v. Flook*, and *Diamond v. Diehr*—the earliest case, *Benson*, most directly addresses the underlying patentability concerns discussed above. In *Benson*, the Court considered a patent application for a method of converting binary-coded decimal numerals into pure binary numbers, a process to be performed by a computer. 409 U.S. at 64. The patent application disclosed only a series of mathematical operations to be performed on any number entered

[4] The notion of patent overbreadth is plainly related to the prohibition on patents for "fundamental truths." The broader an idea is, the more it resembles a fundamental principle, and the greater the justification for holding it in common for the good of all. But *Le Roy*'s second reason for excluding subject matter from §101 addresses a distinct concern—patents should not issue when they would inhibit future innovation.

as the input; the process would then provide a new, binary number as output. The Court began its analysis by expressly citing *Le Roy*'s first limitation on patentability, that a "principle, in the abstract … cannot be patented, as no one can claim in [it] an exclusive right." *Id.* at 67. But the *Benson* opinion also reflected *Le Roy*'s prohibition on overbroad patents, noting that the claim was so "abstract and sweeping as to cover both known and unknown uses" of the claimed decimal-to-binary conversion formula. *Id.* at 68. Indeed, the Court expressly compared the overbreadth of the claim in *Benson* to that of the rejected claim in *Morse*. *Id.* The *Benson* Court concluded that the claim was so broad that "if the judgment below [were] affirmed, the patent would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Id.* at 72. This Court thus decided *Benson* with *Le Roy*'s exclusions from patentability in mind, and in light of those limitations *Benson* seems an easy case. The ability to convert decimal numerals into binary numbers is a feature of the world in which we live from which all should benefit. Moreover, mathematics in general is one of the "basic tools" of scientific and technological work, and permitting a patent on the process for making this conversion would surely inhibit innovation in some areas.

Diehr involved the patentability of a process for curing synthetic rubber using a previously known mathematical formula, the "Arrhenius equation." Like *Benson*, the *Diehr* Court noted that no individual is entitled to a monopoly over a "phenomenon of nature" but yet "an *application* of a law of nature or mathematical formula … may well

be deserving of patent protection." *Diehr*, 450 U.S. at 188 & n.11. The Court also acknowledged the second concern of *Le Roy*, that a patent should not issue if it will broadly preempt innovation. In *Diehr*, however, while the "claimed process admittedly employ[ed] a well-known mathematical equation," the applicants did not "seek to pre-empt the use of that equation," but only "to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process." *Id.* at 187. Like *Benson*, then, *Diehr* expressly applied the reasons for limiting patent eligibility set forth by *Le Roy* and upheld the patent because it was consistent with those principles.

Flook lies both chronologically and conceptually between *Benson* and *Diehr*. In that case, the application described a process for calculating "alarm limits" used in monitoring catalytic conversion processes. *Flook*, 437 U.S. at 585. According to the Court, a "mathematical algorithm or formula," *id.* at 586, was "the only novel feature of respondent's method." *Id.* at 588. The Court appears to have assumed that all "mathematical algorithms" fall into the *Le Roy* prohibition on patenting "phenomena of nature" and held that because there was nothing else "novel" about the claimed invention a patent could not issue. *Id*. at 594-98.

Notably, however, *Diehr* was more cautious than *Flook* on the question whether an "algorithm" is necessarily unpatentable. *Diehr* characterized *Benson* as holding that "an algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent." 450 U.S. at 186. But *Diehr* cautioned that the term "algorithm" may

have much broader meanings than *Benson*'s definition of a "procedure for solving a given type of mathematical problem," and the *Diehr* Court specifically declined to "pass judgment on whether processes falling outside" that narrow definition would be patentable. 450 U.S. at 186 & n.9. *Diehr* accepted the result in *Flook*, however, reasoning that it was just like *Benson* because an "alarm limit" is "simply a number and the … application sought to protect a formula for computing this number." *Id.* at 186.

D. Not All "Algorithms" Fall Within *Le Roy*'s Limitations on Patentability.

The question reserved by *Diehr*—whether some algorithms may be patentable—has taken on greatly increased significance with the growing ubiquity of computers. Generally speaking, an algorithm is a finite sequence of instructions, an explicit, step-by-step procedure for completing a task. This broad definition of algorithm sounds, of course, much like a "method" or "process." But it also sounds like a computer program. Today's powerful and sophisticated computer hardware allows many processes that were once instantiated in "particular" machines—from sound studio mixing boards used for processing music to many of the most sophisticated devices used in manufacturing—to be accomplished by computers implementing algorithms.

Diehr correctly suggests that the patentability of such algorithms should turn on the Patent Act and its purposes, not on labels or categories. The principles set forth in *Le Roy* again shed considerable light on the issue. As discussed above, *Le Roy* indicates that "principles in the abstract" (*e.g.*, laws

of nature) from which all should benefit should not be patentable, nor should patents issue that would leave others unable to innovate. But the MP3 algorithm discussed *supra* at 8, for example, is *not* a "law of nature." Neither is it an "abstract idea." A particular computerized process for converting large audio files to small ones while preserving the perceived quality of the sound reproduced is simply a tool developed by humans to accomplish a particular task. Such a tool is no more a law of nature or abstract idea than the cotton gin.

The *Le Roy/Morse* principle that patents should not issue if they will broadly "pre-empt" innovation also suggests a need to distinguish patentable from unpatentable algorithms. It would make no sense to grant exclusive rights over F=MA, $E=mc^2$, or the *Benson* formula for converting decimal numbers to binary ones because these are tools that everyone needs to be able to innovate freely. These insights are functionally irreplaceable, unique resources—we cannot expect further innovation to produce a better way to calculate the force generated by a moving object, and preventing people from taking advantage of this formula will thus reduce rather than spur innovation. Again, however, the MP3 algorithm is quite different. Granting exclusive rights over *one* way to reduce audio file sizes will not inhibit innovation—to the contrary, issuing a patent on this method of reducing file sizes may well spur others to invent better (and thus more valuable) ways to achieve the same end.

In short, this Court should take care to ensure that the categories "laws of nature," "natural phenomena," and "abstract ideas" are not

unreflectively conflated or expanded beyond the boundaries justified by the policies underlying exclusions from §101. Categorization should not be allowed to substitute for analysis. Unfortunately, however, that is precisely what has happened in many of the Federal Circuit cases on patentability decided since *Diehr*.

III. THIS COURT SHOULD RECOGNIZE PRINCIPLES FOR PATENTABILITY CONSISTENT WITH THE LANGUAGE AND PURPOSES OF §101.

A. The Federal Circuit's Recent Tests for Patentability have Become Unmoored from the Language and Policies of the Act.

The Federal Circuit has been obliged to address the patent eligibility of "new, onrushing technology" many times since *Diehr*. In recent years, the court has vacillated between two tests for the patentability of a process—one privileging physicality as the key to patentability, and one emphasizing that the result of a patentable process must be useful, concrete, and tangible. Unfortunately, neither test fully reflects the broad language of §101 or the reasons *why* we distinguish patentable from unpatentable subject matter discussed above.

In *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), the Federal Circuit found the claimed process—which involved a programmed computer that translated analog electrocardiograph signals into digital form—patent-eligible because it "transform[ed] one *physical*, electrical signal into another." *Id.* at 1060-

61 (emphasis added). Two years later, in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994), the Federal Circuit again applied a physicality test to determine whether Alappat's rasterizer—a computer programmed to display waveform data in a way that smoothed out the effects of noise and other distractions—was patentable subject matter. The Court determined that the programming permitting the computer to act as a rasterizer effectively creates a new, patent-eligible machine. *Id.* at 1545. Plainly, however, in both cases the physicality analysis was somewhat unsatisfying: electric signals are not very "physical" in the common sense, and re-programming a computer does not really create a new "machine." Moreover, neither case explained *why* patentability should turn on whether the invention claimed a physical transformation or a machine.

The more recent cases of *State Street* and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), responded to the difficulty of applying physicality requirements to algorithmically driven electronic processes by examining the *results* an invention would produce. Specifically, *State Street* found that a process applying a mathematical algorithm is patentable if it produces a "useful, concrete and tangible result." The Court held that a claimed data processing system for managing investment accounts produced such a result: "a final share price momentarily fixed for recording and reporting purposes." 149 F.3d at 1373.

The *State Street* test, however, was also unsatisfying. Dissenting from the dismissal of the writ in *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.*, 548 U.S. 124, 136-37

(2006), Justice Breyer wrote that the notion that *all* processes are patentable so long as they produce a "useful, concrete and tangible result" seems contrary to this Court's precedents. For example, "[t]he Court … has invalidated a claim to the use of electromagnetic current for transmitting messages over long distances even though it produces a result that seems 'useful, concrete, and tangible.'" *Id.* (citing *Morse*). Justice Breyer explained that the *Lab. Corp.* claims "described [a] natural law," *Id.* at 137, that should be "free to all men and reserved exclusively to none." *Id.* at 127-28. Justice Breyer also emphasized that "[patent] protection in [some] cases … would too severely interfere with, or discourage, development and the further spread of useful knowledge itself." *Id.* at 128.

Like Justice Breyer in *Lab. Corp.*, the Federal Circuit's decision below rejected the "useful, concrete, and tangible" test of *State Street*. But while Justice Breyer's analysis returned to *Le Roy*'s fundamental principles underlying patentability, the Federal Circuit's *Bilski* decision returned to the physicality analysis of *Arrhythmia* and *Alappat*, elevating the machine-or-transformation test as the sole test for patentability. *Bilski*, 545 F.3d at 961. As further set forth below, while that analysis may be helpful in some circumstances, it is not a sufficient basis on which to distinguish the patentable from the unpatentable.

B. Analysis of Patentability Consistent with the Fundamental Purposes of the Act Should Consider Both the Nature of the Claimed Process and the End Result.

We argue above that §101 is written in broad terms, but must be read in light of the underlying limitations on patentability articulated by this Court in cases like *Le Roy*. This Court, however, should provide more specific guidance to help the lower courts, the BPAI, and the PTO to distinguish patentable from unpatentable subject matter.

The Court need not entirely re-invent the wheel. Both tests developed by the Federal Circuit in recent years shed some light on the issue. The problem with the machine-or-transformation analysis is *not* that examining whether a claimed invention is "tied to a particular machine" or involves a physical "transformation" is never helpful. To the contrary, in the context of electromechanical devices, a tie to a particular machine helps to insure, for example, against the kind of overbreadth discussed in *Morse*. Industrial Age apparatuses and processes are inherently defined or limited by the physical-mechanical design of the machines involved. *Cf. Corning v. Burden*, 56 U.S. 252, 267 (1853) (suggesting that machines are patentable because they necessarily "produce a certain effect or result"). But the same cannot be said in the computer age. A primary benefit of modern computer hardware is that a broad range of processes can be run on a single device, limited only by the ingenuity and skill of the programmer. Accordingly, a tie to a "general purpose" computer should not mean that *any* process is patentable, but neither should it mean that *no*

process is. It simply means that a tie to a machine is no longer an adequate test for patentability.

For such claims, *State Street* offers some help by looking to the *result*, rather than to ill-adapted physicality requirements. In many cases, a concrete, useful, and tangible result will suffice to distinguish a patentable application of an abstract principle from the unpatentable idea itself. As a general matter, a computer-implemented process—like the MP3 algorithm—that yields a specific concrete, useful, and tangible result will resemble a human-created tool rather than the kind of "natural law" or "fundamental truth" that *Le Roy* suggested should be held in common by all.

But the "concrete, useful, and tangible" test does not really address *Le Roy*'s other concern—*i.e.*, that a patent should not issue when it would be so broad or vague as to impede future innovation. Accordingly, while the machine-or-transformation test runs the risk of underinclusiveness with regard to contemporary processes like MP3 technology, *State Street*—as Justice Breyer observed in *Lab. Corp.*—appears overinclusive.

Below, Yahoo! argued that the *State Street* focus on results is incomplete because this Court has consistently taken care to examine not only the result, but also the particularity of the process by which that result is reached. Consistent with *Le Roy*'s prohibition on patents that would "preempt" innovation, only a patent on a *specific* way of reaching a result should be patentable. An application must be "sufficiently definite to confine the patent monopoly within rather definite bounds," *Benson*, 409 U.S. at 69, because a general

patent on *all* ways of reaching a result would create the kind of monopoly that inhibits innovation. Yahoo! has described this analysis of the breadth of the claimed process as an inquiry into whether the process sets forth a series of "clearly defined steps" that are "stable, predictable, and reproducible."

Although this Court's cases do not use those terms, they do appear to examine the claims for stability, predictability, and reproducibility.[5] In *Flook*, for example, the Court emphasized that the claims as a whole did not adequately describe a specific process for incorporating the calculated alarm limit into the catalytic conversion process:

> The patent application does not purport to explain how to select the appropriate margin of safety, the weighting factor, or any of the other variables. Nor does it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit.

437 U.S. at 586; *see also Diehr*, 450 U.S. at 192 n.14 (emphasizing that these shortcomings had been

[5] The core concept of stable, predictable, and reproducible claims harkens back to the Patent Act of 1790, which insisted that patent descriptions "shall be so particular, and said models so exact, as not only to distinguish the invention or discovery from other things before known and used, but also to enable a workman or other person skilled in the art or manufacture … to make, construct, or use the same." 1 Stat. 109, 110.

critical to the decision in *Flook*). In short, in this Court's view, the application revealed no specific, reproducible *process*, but only an idea for a mathematical computation.

The *Diehr* Court also examined the specific steps claimed there. The Court found that "respondents' claims describe in detail a step-by-step method for accomplishing [the curing of synthetic rubber] beginning with the loading of a mold with raw, uncured rubber and ending with the eventual opening of the press at the conclusion of the cure." 450 U.S. at 184. In the Court's view, the fact that the application disclosed a particular process rather than a broad idea that could be accomplished through a variety of processes was critical to holding that the claims as a whole were patent-eligible. *Diehr* thus confirms that under §101 it is significant whether the claimed process is sufficiently stable, predictable, and reproducible, as well as whether there is a useful, concrete, and tangible result. As the Court put it over a century ago, "[w]hoever discovers that a *certain useful result* will be produced in any art by the use of *certain means* is entitled to a patent for it" *Tilghman v. Proctor*, 102 U.S. 707, 728 (1881) (emphasis added).

In urging the Court to recognize that a patent may issue only for a particular, step-by-step process set forth by the application—a process that is stable, predictable, and reproducible—Yahoo! seeks to refocus the patentability analysis on the core policies underlying the Patent Act and this Court's decisions. A patentable process must both describe an *application* of a principle rather than an abstract idea, and it must describe that application in a way

that is sufficiently detailed and circumscribed to allow ample space for future innovation. *Cf. Morse*, 56 U.S. at 119 (an inventor must "specif[y] the means he uses in a manner so full and exact that anyone skilled in the science ... can, by using the means he specifies, without any addition to or subtraction from them, produce precisely the result he describes"). Sufficient specificity to ensure that the process may be predictably and reliably reproduced will protect future inventors from wrongful claims of patent infringement. In contrast, a process that may consist of one set of steps today and another tomorrow occupies a vague and ever-shifting patentable space, and would-be innovators could not know what is protected and what remains fair game.

Finally, it bears emphasis that Yahoo!'s focus on the stability, predictability, and reproducibility of the *process* itself, as well as on a concrete, useful, and tangible *result*, should not be taken to embrace the mistaken notion that patentable claims must describe every detail of the process. Consider the invention in *Neilson v. Thompson*, Web. P.C. 275, discussed at length in *Tilghman*, 102 U.S. at 722-26. Neilson invented a process for introducing hot air into a furnace by heating the air in a receptacle between a blowing apparatus and the furnace. *Id.* at 725. Notably, however, Neilson claimed "no particular mode of constructing the receptacle, or of heating it"; his invention lay in using a receptacle to heat air *before* introducing it into a furnace. *Id.* at 726. This invention is stable, predictable, and reproducible regardless of the shape of the receptacle or the nature of the heat source, and claims need not contain that level of specificity. In contrast, Morse's

claim for any way of using electro-magnetism to print at a distance is just an idea—there is no way to reliably reproduce it unless much more is known about the nature of the invention. But if Morse's description of a specific, wired telegraph device to communicate over distance had included a disclaimer that it would not matter what kind of wires were used, the invention would have remained patentable notwithstanding that lack of specificity. The key question is whether the invention can be reliably reproduced, not whether every detail is articulated by the claims. *See Cochrane v. Deener*, 94 U.S. 780, 788 (1877) (noting that the process in that case "requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence").

IV. BILSKI'S INVENTION IS NOT PATENT-ELIGIBLE.

Under the test proposed by Yahoo!—which focuses on both the result a process produces as well as the steps by which that result is achieved—the patent application in this case was properly rejected.

Below, Bilski argued that the claimed method "produces 'a useful, concrete, and tangible result'" because it enables commodities suppliers and consumers to lessen their risk from varying prices caused by fluctuations in the demand for the commodity. *See* App. Supp. Br. 3. But the implementing steps of Bilski's process are so inadequately defined that they cannot be reliably followed to produce the result in a stable, predictable, or reproducible manner. For example, both the first and third limitations of the claim

involve "initiating a series of transactions." There are, however, many ways to initiate a series of transactions, and the claim as a whole provides no constraint, structure, or definition to explain how these steps are to be performed. In short, these steps are so indefinite that they represent essentially no limitation at all. Accordingly, the claim as written is "so abstract and sweeping" that it would "wholly preempt" the use of any means to achieve the intended result. *See Benson*, 409 U.S. at 68-72. As such, Bilski's application essentially attempts to broadly patent the idea of hedging, at least with respect to commodities trading, and should be held not to state statutory subject matter.

Notably, however, that does not mean that no application for a hedging process could be patent-eligible. If Bilski had developed a process that, in machine-like fashion, directed commodities traders to take a clearly defined series of steps to hedge their positions, that process might lead to useful, concrete, and tangible results. Such a process would be a man-made tool for achieving a particular result, not an unpatentable law of nature. In addition, a patent for such a specific process would not broadly preempt other methods of hedging, so it would not foreclose innovators from developing superior hedging processes. Again, though, Bilski's claim is anything but a clearly defined series of steps that are stable, predictable, and reproducible—and that failure, rather than the absence of a machine or a physical transformation, is why it should not be patent-eligible.

CONCLUSION

The Court should uphold the Federal Circuit's rejection of Bilski's patent application, but should also hold that the Federal Circuit erred by concluding that the machine-or-transformation test is the definitive test for determining patent eligibility. The Court should adopt a test derived from the broad language of §101 and this Court's decisions focusing on its meaning—a test under which a process application is patent-eligible if it sets forth a defined series of steps that are stable, predictable, and reproducible and lead to results that are useful, concrete, and tangible.

Respectfully submitted.

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