No. 08- ____

IN THE

Supreme Court of the United States

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

v.

JOHN J. DOLL, ACTING UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND ACTING DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

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QUESTIONS PRESENTED

Whether the Federal Circuit erred by holding that a "process" must be tied to a particular machine or apparatus, or transform a particular article into a different state or thing ("machine-or-transformation" test), to be eligible for patenting under 35 U.S.C. § 101, despite this Court's precedent declining to limit the broad statutory grant of patent eligibility for "any" new and useful process beyond excluding patents for "laws of nature, physical phenomena, and abstract ideas."

Whether the Federal Circuit's "machine-or-transformation" test for patent eligibility, which effectively forecloses meaningful patent protection to many business methods, contradicts the clear Congressional intent that patents protect "method[s] of doing or conducting business." 35 U.S.C. § 273.

PARTIES TO THE PROCEEDING

Pursuant to Rule 14.1(b), the parties here and in the proceeding in the U.S. Court of Appeals for the Federal Circuit are listed.

Petitioners here and appellants below are Bernard L. Bilski and Rand A. Warsaw. The real party in interest is EQT IP Ventures, LLC.

Respondent here and appellee below is the Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office, currently John J. Doll (Acting).

RULE 29.6 CORPORATE DISCLOSURE STATEMENT

All parent corporations and publicly held companies that own 10% or more of the stock of EQT IP Ventures, LLC are: Equitable Resources, Inc.

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The opinion of the U.S. Court of Appeals for the Federal Circuit (App., *infra*, 1a-143a) is reported at *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc). The Order of the U.S. Court of Appeals for the Federal Circuit granting a hearing en banc (App., *infra*, 144a-145a) is reported at *In re Bilski,* 264 F. App'x 896 (Fed. Cir. 2008).

The opinion of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (App., *infra*, 146a-205a) is reported at *Ex parte Bilski*, 2006 WL 5738364 (B.P.A.I. Sept. 26, 2006).

JURISDICTION

The en banc judgment of the U.S. Court of Appeals for the Federal Circuit was entered on October 30, 2008. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

"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 therefore, subject to the conditions and requirements of this title." 35 U.S.C. § 101.

"The term 'process' means 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).

"It shall be a defense to an action for infringement under section 271 of this title with respect to any subject matter that would otherwise infringe one or more claims for a method in the patent being asserted against a person, if such person had, acting in good faith, actually reduced the subject matter to practice at least 1 year before the effective filing date of such patent, and commercially used the subject matter before the effective filing date of such patent." 35 U.S.C. § 273(b)(1).

"[T]he term 'method' means a method of doing or conducting business." 35 U.S.C. § 273(a)(3).

INTRODUCTION

This case raises the most fundamental question in patent law: what can be patented? Are patents only for manufacturing processes that are tied to a particular machine or produce some physical transformation? Or do patents also embrace modern business processes that do not depend on a particular machine or device?

A primary strength of the Patent Act is that it does not limit what can be patented by subject matter, thereby adapting to and encouraging innovation at the forefront of technology. 35 U.S.C. § 101 provides that "any" new and useful process, machine, manufacture, or composition of matter may be patented, so long as the other requirements for patentability are met. There is no exclusion for business methods or any other field of invention. The only limit this Court has imposed on the broad statutory grant is that patents may not be obtained for "laws of nature, natural phenomena, and abstract ideas." Indeed, natural laws and phenomena can never qualify for patent protection because they cannot be invented at all. And abstract ideas are not eligible because they are not "useful" and thus must be applied to a practical use before they can be patented.

Beyond that, however, this Court has not placed restrictions on the types of inventions that can be patented, consistent with the broad statutory grant of patent eligibility in § 101. The Court has twice expressly declined to hold that a process must be tied to a particular machine or produce some physical transformation to be eligible for patenting. And the Court of Appeals for the Federal Circuit seemed to agree. While refusing patents for abstract ideas and laws of nature, the court allowed patenting of inventions that

produced a "useful, concrete and tangible result." By adhering to the statute, which was designed to accommodate and encourage innovation, the Federal Circuit made patent protection available to such diverse fields as internet commerce, information technology, and business methods.

Tens of thousands of process patents have now issued in reliance on the Patent Act's lack of subject matter restrictions and the decisions of both this Court and the Federal Circuit refusing to restrict patent eligibility except to exclude abstract ideas and laws of nature. The Federal Circuit has abruptly changed course, however, and held that the "machine-or-transformation" test, which this Court has never said is required for patent eligibility, is in fact not optional or merely advisory but rather "the only applicable test" for patent-eligible processes. In doing so, the Federal Circuit has essentially confined all process patents to manufacturing methods, using a test that may have been appropriate during the Industrial Age but no longer fits our modern information-based economy. Not only is the test backward-looking, but it is also inconsistent with the patent statute's recognition that business methods are eligible for patenting. And while directed to a business method, the Federal Circuit's decision threatens other industries as well, such as software and biotechnology, which are important to the nation's economy. The decision has disrupted the settled expectations of patent owners and cast doubt on tens of thousands of issued patents.

This Court has not considered what is patentable subject matter since 1981, when computers were just becoming part of daily life. It is now time to do so again to prevent the Federal Circuit's outmoded "ma-

chine-or-transformation" test, while ostensibly rooted in this Court's decisions, from stifling innovation in our most vital industries and frustrating Congress' intent as expressed in the Patent Act. The Court should grant the petition so that it can instruct the Federal Circuit to return to first principles and restore the law of patent eligibility for processes under § 101.

STATEMENT OF THE CASE

A. The Claimed Invention

Bernard L. Bilski and Rand A. Warsaw invented a method of hedging the consumption risk associated with a commodity sold at a fixed price for a given period. The method can be used, for example, with energy commodities like natural gas, electricity, or coal, and includes ways to compensate for the risk of abnormal weather conditions. It enables both energy suppliers and consumers to minimize the risk of fluctuations in demand during a given period. Thus, for example, a school district with a fixed tax base and budget for heating or cooling requirements can be protected from yearly fluctuations in weather, while the suppliers are protected from the opposite effect of such fluctuations.

More specifically, the Bilski patent application, entitled "Energy Risk Management Method," describes a method in which energy consumers, such as businesses and homeowners, are offered a fixed energy bill, for example, for the winter so they can avoid the risk of high heating bills due to abnormally cold weather. An intermediary or "commodity provider" sells natural gas, in this example, to a consumer at a fixed price based upon its risk position for a given period of time, thus isolating the consumer from an un-

usual spike in demand caused by a cold winter. Regardless of how much gas the consumer uses consistent with the method, the heating bill will remain fixed.

Having assumed the risk of a very cold winter, the same commodity provider hedges against that risk by buying the energy commodity at a second fixed price from energy suppliers called "market participants." These market participants or suppliers have a risk position counter to the consumers, that is, they want to avoid the risk of a high drop in demand due to an unusually warm winter. A market participant could be, for example, someone who holds a large inventory of gas and wants to guarantee the sale of a portion of it by entering into a contract now. The risk assumed in the transactions with the market participants at the second fixed rate balances the risk of the consumer transactions at the first rate.

According to the patent application, setting the fixed price is not a simple process. The application discloses a complicated mathematical formula for calculating the price:

$$\text{Fixed Bill Price} = Fi + [(Ci + Ti + LDi) \times (\alpha + ßE\,(Wi))]$$

In this equation, α + ßE (Wi) represents an approximation of the amount of consumption driven by the weather, which is estimated with a least squares statistical model. The commodity provider must take additional statistical modeling steps (Monte Carlo simulations, one-tail tests) to properly price a deal and estimate an acceptable margin over the entire portfolio of transactions.

The method of the invention does not necessarily have to be performed on a particular machine or computer, although the practice of the invention will

most likely involve both computers and modern telecommunications. The method steps are no less real, however, as they require communicating and negotiating with consumers and suppliers in a particular way to balance the risk positions. The invention is claimed in a series of steps as follows:

> 1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:
>
> (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;
>
> (b) identifying market participants for said commodity having a counter-risk position to said consumers; and
>
> (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

Claim 4 of the patent application is similar to claim 1 except that it specifies precisely how the fixed price for an energy consumer transaction is determined using the mathematical formula:

> 4. A method for managing weather-related energy price risk costs sold by an energy provider at a fixed price comprising the steps of:

(a) initiating a series of transactions between said energy provider and energy consumers wherein said energy consumers purchase energy at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers, wherein the fixed price for the consumer transaction is determined by the relationship:

$$\text{Fixed Bill Price} = Fi + [(Ci + Ti + LDi) \times (\alpha + \beta E(Wi))]$$

wherein,

Fi = fixed costs in period i;

Ci = variable costs in period i;

Ti = variable long distance transportation costs in period i;

LDi = variable local delivery costs in period i;

E(Wi) = estimated location-specific weather indicator in period i; and

α and ß are constants;

(b) identifying other energy market participants having a counter-risk position to said consumers; and

(c) initiating a series of transactions between said energy provider and said other energy market participants at a second fixed rate such that said series of transactions balances the risk position of said series of consumer transactions.

B. Proceedings in the Patent and Trademark Office

The examiner in the Patent and Trademark Office (PTO) rejected the Bilski application under 35 U.S.C.

§ 101, which sets forth the types of inventions that can be patented. The examiner stated that "the invention is not implemented on a specific apparatus and merely manipulates [an] abstract idea and solves a purely mathematical problem without any limitation to a practical application, therefore, the invention is not directed to the technological arts." App., *infra*, 148a.

The Bilski applicants appealed the rejection to the PTO Board of Patent Appeals and Interferences under 35 U.S.C. § 134(a). The PTO Board had jurisdiction pursuant to 35 U.S.C. § 6(b). An expanded panel of the PTO Board affirmed the rejection in a 70-page opinion. Observing that there were "unresolved issues under § 101" for "non-machine-implemented" methods, such as claimed in the Bilski application, the Board stated that "[t]he question of whether this type of . . . subject matter is patentable is a common and important one" to the PTO, "as the bounds of patentable subject matter are increasingly being tested." App., *infra*, 151a, 154a. The Board added that, after the Federal Circuit's decisions in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the PTO "has been flooded with claims to 'processes,' many of which bear scant resemblance to classical processes of manipulating or transforming compositions of matter or forms of energy from one state to another." App., *infra*, 151a.

Admitting that it was "struggling to identify some way to objectively analyze the statutory subject matter issue," *id.* at 154a, the PTO Board analyzed the claims under various tests. The Board considered this Court's exclusion of "abstract ideas" in *Diamond*

v. Diehr, 450 U.S. 175 (1981), the Federal Circuit's "useful, concrete, and tangible result" test from *State Street Bank*, the "transformation of physical subject matter" test discussed by the Board in *Ex parte Lundgren*, 76 U.S.P.Q.2d 1385, 2004 WL 3561262 (B.P.A.I. 2005), and the PTO's Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, 1300 Off. Gaz. Pat. & Trademark Office 142 (Nov. 22, 2005). App., *infra*, 180a-190a. Applying these various tests, the PTO Board concluded that the Bilski claims did not recite statutory subject matter. The Board reversed the examiner's reasoning, however, affirming its earlier holding in *Lundgren* that the "technological arts" is not a separate and distinct test for statutory subject matter. *Id*. at 180a. The Board also refuted the examiner's requirement of a specific apparatus because a claim may still be patent eligible "if there is a transformation of physical subject matter from one state to another." *Id*. at 181a. Elaborating further, the Board stated: "'mixing' two elements or compounds to produce a chemical substance or mixture is clearly a statutory transformation although no apparatus is claimed to perform the step and although the step could be performed manually." *Id*.

According to the PTO Board, however, the Bilski claims do not involve any patent-eligible transformation because they only transform "non-physical financial risks and legal liabilities of the commodity provider, the consumer, and the market participants." *Id*. at 182a. The Board concluded that the claims merely recite an "abstract idea" since they are not "instantiated in some physical way so as to become a practical application of the idea." *Id*. at 184a. Recognizing that actual physical acts of individuals or organizations would still be required to implement

the steps of the method, the Board nevertheless held that the claims were directed to the "'abstract idea' itself" because they cover any and every possible way of performing those steps. *Id*.

C. The Federal Circuit's En Banc Decision

The Bilski applicants appealed the PTO Board's decision to the Court of Appeals for the Federal Circuit under 35 U.S.C. § 141. The Federal Circuit had jurisdiction over the appeal pursuant to 28 U.S.C. § 1295(a)(4)(A). In its brief to the Federal Circuit, the PTO observed that the court "has had little opportunity to address the eligibility of this brand of method inventions," and that "the PTO has struggled to offer its examiners clear guidance on this issue." Br. for Appellee (June 13, 2007) at 4. Further, the PTO noted that it has "been inundated with an unprecedented number of patent applications" that claim processes but "do not require any machine or apparatus for implementing the method, nor do the claims require any transformation of subject matter, tangible or intangible, from one state into another." *Id*. The PTO therefore "welcome[d] this opportunity for [the Federal Circuit] to resolve this important question." *Id*.

After argument before a panel of the court, but before any decision, the Federal Circuit ordered that the appeal would be heard en banc. App., *infra*, 144a. According to Circuit Judge Mayer, the court took the case en banc "in a long-overdue effort to resolve primal questions on the metes and bounds of statutory subject matter." App., *infra*, 131a (Mayer, J.,

dissenting). In its en banc Order, the court posed five questions to be addressed in supplemental briefing:

> (1) Whether claim 1 of the [Bilski] patent application claims patent-eligible subject matter under 35 U.S.C. § 101?
>
> (2) What standard should govern in determining whether a process is patent-eligible subject matter under section 101?
>
> (3) Whether the claimed subject matter is not patent-eligible because it constitutes an abstract idea or mental process; when does a claim that contains both mental and physical steps create patent-eligible subject matter?
>
> (4) Whether a method or process must result in a physical transformation of an article or be tied to a machine to be patent-eligible subject matter under section 101?
>
> (5) Whether it is appropriate to reconsider *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), in this case and, if so, whether those cases should be overruled in any respect?

App., *infra*, 144a-145a.

Responding to these questions and the en banc Order, thirty-eight amicus briefs were filed by patent owners, bar associations, industry associations, professors, and interested individuals. The various *amici* represented diverse industries, including financial services, management consulting, computer software, biotechnology, insurance, and tax accounting. The Federal Circuit also invited two *amici* to

participate at oral argument. Those *amici* presented vastly different views on the proper interpretation of this Court's precedent concerning patent-eligible processes under § 101.

In a fractured decision, the en banc Federal Circuit held that Bilski's claims are not eligible for patenting and set forth a single, "definitive" test for determining whether a process is patent-eligible under § 101: a process is patent-eligible only if "(1) it is tied to a particular machine or apparatus, <u>or</u> (2) it transforms a particular article into a different state or thing." App., *infra*, 12a. Although the Supreme Court has twice expressly declined to hold that this so-called "machine-or-transformation" test is the only test for patentable processes under § 101, *see Gottschalk v. Benson*, 409 U.S. 63, 71 (1972); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978), the Federal Circuit majority opinion seized on a sentence from *Diamond v. Diehr*, 450 U.S. 175, 184 (1981), quoted from *Benson*, 409 U.S. at 70, that "[t]ransformation and reduction of an article 'to a different state or thing' is *the* clue to the patentability of a process claim that does not include particular machines" (emphasis added). Taking this Court's description of the machine-or-transformation test as "*the*" clue literally, the majority held that this test was not "optional or merely advisory" but rather "the only applicable test" for patent-eligible processes. App., *infra*, 15a-16a, n.11, 34a.

In doing so, the Federal Circuit majority overruled its earlier decisions in *State Street Bank* and *AT&T* to the extent they relied on a "useful, concrete, and tangible result" as the test for patent eligibility under § 101. This formulation, which was originally set forth by the en banc Federal Circuit in *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994), was discarded in

Bilski as "inadequate." App., *infra*, 24a. Although *Alappat*, *State Street Bank*, and *AT&T* all contain extensive discussions of the same Supreme Court cases now relied on in support of the "machine-or-transformation" test, the Federal Circuit observed that "useful, concrete, and tangible result" was "never intended to supplant the Supreme Court's test." *Id*.

The Federal Circuit majority opinion nevertheless acknowledged some doubt about its interpretation of this Court's precedent as dictating that the "machine-or-transformation" test is the sole test for patentable processes. Citing this Court's opinion in *Diehr*, where the Court stated (450 U.S. at 192):

> [W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g*., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101.

the majority admitted that "language such as the use of 'e.g.' may indicate the Supreme Court's recognition that the machine-or-transformation test might require modification in the future." App., *infra*, 17a-18a, n.12. The majority also recognized that this Court "may ultimately decide to alter or perhaps even set aside this test to accommodate emerging technologies." *Id*. at 17a.

The Federal Circuit majority's holding that "the machine-or-transformation test is the only applicable test" for patent-eligible processes, *id*. at 34a, provoked several vigorous dissents. Reviewing two cen-

turies of precedent and statutory history, Circuit Judge Newman maintained in dissent that the majority's test is "a new and far-reaching restriction on the kinds of inventions that are eligible to participate in the patent system." *Id*. at 60a. The majority's decision, she wrote, introduces untold uncertainties that "not only diminish the incentives available to new enterprise, but disrupt the settled expectations of those who relied on the law as it existed." *Id*. at 61a.

Circuit Judge Rader likewise dissented because, in his view, the majority's machine-or-transformation test "disrupts settled and wise principles of law." *Id*. at 134a. In particular, he wrote, "the statute does not mention 'transformations' or any of the other Industrial Age descriptions of subject matter categories that this court endows with inordinate importance today." *Id*. at 142a-143a. According to Judge Rader, the majority's test "propagates unanswerable questions" and "links patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes." *Id*. at 134a, 142a.

Also in dissent, Circuit Judge Mayer wrote that the majority's test is "unnecessarily complex and will only lead to further uncertainty regarding the scope of patentable subject matter." *Id*. at 131a. While the PTO and the larger patent community have actively sought guidance from the Federal Circuit on this issue, Judge Mayer contended that "[t]he majority's 'measured approach' to the section 101 analysis . . . will do little to restore public confidence in the patent system." *Id*. at 132a.

REASONS FOR GRANTING THE PETITION

I. THE FEDERAL CIRCUIT'S RIGID "MACHINE-OR-TRANSFORMATION" TEST CONFLICTS WITH THIS COURT'S PRECEDENT AND CONGRESSIONAL INTENT

In its last two decisions on § 101, the Supreme Court set forth the proper test for patentable subject matter: "anything under the sun that is made by man" except "laws of nature, natural phenomena, and abstract ideas." *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *Diamond v. Diehr*, 450 U.S. 175, 182, 185 (1981). The Court should grant the petition so that it can instruct the Federal Circuit to return to these first principles and restore the law of patent eligibility for processes under § 101.

Section 101 of the Patent Act provides patent eligibility for "any" new and useful process. In *Chakrabarty*, this Court noted that "Congress plainly contemplated that the patent laws would be given wide scope." 447 U.S. at 308. Indeed, the Court was informed by Congressional intent that statutory subject matter "include anything under the sun that is made by man." *Id*. at 309 (quoting S. REP. NO. 82-1979, at 5 (1952), as reprinted in 1952 U.S.C.C.A.N. 2394, 2399; H.R. REP. NO. 82-1923 at 6 (1952)). The Court observed, however, that "laws of nature, physical phenomena, and abstract ideas have been held not patentable." *Id*.

Diamond v. Diehr then set forth the broad framework for analyzing the eligibility of process claims for patenting under § 101. The Court again acknowledged Congress' intent that statutory subject matter "include anything under the sun that is made by man," and that "laws of nature, natural phenomena,

and abstract ideas" are excluded from protection. 450 U.S. at 182, 185. Under *Diehr*, a process claim that includes one of these fundamental principles is eligible for patenting so long as the process, taken as a whole, represents "an *application* of a law of nature or mathematical formula." *Id*. at 187. The *Diehr* Court likened a process including an abstract idea to the discovery of an unknown phenomenon of nature: "If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end." *Id*. at 188 n.11 (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)). This distinction between a practical application and an abstract principle should be the dividing line for patentable subject matter—not the Federal Circuit's rigid "machine-or-transformation" test.

The Supreme Court has twice expressly declined to hold that the "machine-or-transformation" test is the only test for determining whether a process is eligible for patenting under § 101, as the Federal Circuit majority has now done. *In Gottschalk v. Benson*, 409 U.S. 63, 71 (1972), the Court wrote:

> 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.

The Court reaffirmed this position in *Parker v. Flook*:

> The statutory definition of "process" is broad. An argument can be made, however, 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." 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.

437 U.S. 584, 588 n.9 (1978) (citations omitted).

Contrary to this Court's precedent, the Federal Circuit majority held that the machine-or-transformation test is not "optional or merely advisory" but rather "the only applicable test" for patent-eligible processes. App., *infra*, 15a-16a, n.11, 34a. In doing so, the Federal Circuit majority misread the cases, relying on a statement in *Diehr*, 450 U.S. at 184 (quoting *Benson*, 409 U.S. at 70), that transformation is "*the*" clue to patentability as mandating the rigid "machine-or-transformation" test. App., *infra*, 15a-16a. But *Benson* itself expressly did not hold that a process must be tied to a machine or transform subject matter to be eligible for patenting. 409 U.S. at 71. And *Diehr* cited the transformation test as only an example (using the signal "*e.g.*") of a process that would satisfy § 101. 450 U.S. at 192.

Less than ten years ago, the Federal Circuit considered these very same Supreme Court cases in *State Street Bank* and *AT&T* and reached a different conclusion. At that time, instead of imposing a mandatory "machine-or-transformation" requirement for patent eligible processes under § 101, the court used a "useful, concrete, and tangible result" as the test for patent eligibility. *State Street Bank*, 149 F.3d at 1373; *AT&T*, 172 F.3d at 1361; *see also In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc). Now, the Federal Circuit majority has simply changed course with no new guidance from this Court or Con-

gress, thereby disrupting what were previously "settled and wise principles of law." App., *infra*, 134a (Rader, J., dissenting).

Absent clear legislative guidance that process patents must be tied to a particular machine or transform subject matter, the courts should not impose such limitations. 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.'" *Chakrabarty*, 447 U.S. at 308 (quoting *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933)); *Diehr*, 450 U.S. at 182. A primary strength of the Patent Act is the lack of subject matter exclusions, leaving the door open for emerging technologies. By design, "Congress employed broad general language in drafting § 101 precisely because such inventions are often unforeseeable." *Chakrabarty*, 447 U.S. at 316.

Most recently, Congress embraced the Federal Circuit's holding in *State Street Bank*, 149 F.3d at 1373, that a process involving an abstract idea is patentable if it produces a "useful, concrete, and tangible result," as the proper interpretation of § 101. Enacting 35 U.S.C. § 273 to provide a prior inventor defense to infringement of business method patents, Congress explained: "[a]s the Court [in *State Street Bank*] noted, the reference to the business method exception had been improperly applied to a wide variety of processes, blurring the essential question of whether the invention produced a 'useful, concrete, and tangible result.'" 145 Cong. Rec. S14696-03, S14717 (daily ed. Nov. 17, 1999). As acknowledged by Congress, the "essential question" for process patenting is whether a process applies a fundamental principle to a useful end result, not whether the proc-

ess is tied to a particular machine or transforms articles.

The Federal Circuit majority's "machine-or-transformation" test is unnecessarily restrictive on patent-eligible subject matter under § 101 and contrary to the plain language of the statute that "any new and useful process" is eligible for patenting. The *Diehr* test, excluding only "laws of nature, physical phenomena, and abstract ideas," has proven flexible enough to adapt to emerging technologies, such as a data processing system for managing a financial services configuration of a portfolio, *State Street Bank*, 149 F.3d at 1373 ("In *Diehr*, the Court explained that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application."), a method for automatically routing interexchange calls in a telecommunications system, *AT&T*, 172 F.3d at 1356-57 ("In *Diehr*, the Court expressly limited its two earlier decisions in *Flook* and *Benson* by emphasizing that these cases did no more than confirm the 'long-established principle' that laws of nature, natural phenomena, and abstract ideas are excluded from patent protection."), and a method for analyzing electrocardiograph signals to detect heart problems, *Arrhythmia Research Tech.*, *Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1057 (Fed. Cir. 1992) ("In *Diamond v. Diehr* the Court explained that non-statutory status under section 101 derives from the 'abstract', rather than the 'sweeping', nature of a claim that contains a mathematical algorithm."), among many others.

The Bilski invention, while not meeting the Federal Circuit's rigid "machine-or-transformation" test, is not merely an "abstract idea." It should be eligible

for patenting under § 101 and fully examined for patentability under the other provisions of the Patent Act. Attempts to fuse § 101 with other requirements of patentability, such as whether the invention is novel (§ 102), unobvious (§ 103), or sufficiently described (§ 112), are improper. This Court has explained that:

> Section 101 . . . is a general statement of the type of subject matter that is eligible for patent protection "subject to the conditions and requirements of this title." Specific conditions for patentability follow . . . . The question therefore of whether a particular invention is novel is "wholly apart from whether the invention falls into a category of statutory subject matter."

Diehr, 450 U.S. at 189-90 (quoting *In re Bergy*, 596 F.2d 952, 961 (C.C.P.A. 1979)). Barring the Bilski invention at the door of § 101 based on the "machine-or-transformation" test is contrary to the statute and this Court's precedent.

II. CERT. SHOULD BE GRANTED TO PREVENT THE FEDERAL CIRCUIT AND THE PTO FROM LIMITING PROCESS PATENTS TO MANUFACTURING METHODS

With the *Bilski* decision and more recent decisions that follow it, both the Federal Circuit and the PTO have essentially limited process patents to manufacturing methods and excluded business methods, contrary to the patent statute. Although the plain language of § 101 extends patent eligibility to "any new and useful process, machine, manufacture, or composition of matter," both the Federal Circuit and the PTO now insist that a patent-eligible "process" must be tied to one of the other statutory categories. Cir-

cuit Judge Newman admonished that "the United States Supreme Court has never held that 'process' inventions suffered a second-class status under our statutes, achieving patent eligibility only derivatively through an explicit 'tie' to another statutory category." App., *infra*, 89a (Newman, J., dissenting).

Nonetheless, a panel of the Federal Circuit recently conferred such second-class status on process inventions. *In re Comiskey*, ___ F.3d ___, 2009 WL 68845, at *8 (Fed. Cir. Jan. 13, 2009). In *Comiskey*, the Federal Circuit held that "a claim reciting an algorithm or abstract idea can state statutory subject matter only if, as employed in the process, it is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter." *Id*. In other recent decisions, the PTO Board of Patent Appeals and Interferences listed only manufacturing processes from the 19th and early 20th centuries as examples of processes sufficiently transformative to be eligible for patenting. *Ex parte Langemyr*, 2008 WL 5206740, slip op. at 9, n.3 (B.P.A.I. May 28, 2008); *Ex parte Wasynczuk*, 2008 WL 2262377, slip op. at 12-13, n.3 (B.P.A.I. June 2, 2008).

Requiring transformation of subject matter improperly restricts patent-eligible processes to manufacturing methods and "freeze[s] process patents to old technologies, leaving no room for the revelations of the new, onrushing technology," despite this Court's precedent to the contrary. *See Benson*, 409 U.S. at 71. This flies in the face of the long-held tenet that "the inventions most benefitting mankind are those that 'push back the frontiers.'" *Chakrabarty*, 447 U.S. at 316 (quoting *Great A. & P. Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 154 (1950)).

While the Federal Circuit majority purported to reject a categorical exclusion of business method patents, App., *infra*, 25a, its holding has the practical effect of precluding most patents on business methods. Many business methods relate to human behavior or the flow of information, neither of which would satisfy the Federal Circuit's "machine-or-transformation" test. The *Diehr* test, on the other hand, can be applied to modern-day business processes as readily as to by-gone manufacturing processes, or even to the paper-based business innovations from the earliest days of the patent system.[1]

Restricting process patents to manufacturing methods that satisfy the "machine-or-transformation" test is not only backward-looking, it is inconsistent with the patent statute's recognition that business methods are eligible for patenting. *See* 35 U.S.C. § 273(a)(3) ("[T]he term 'method' means a method of doing or conducting business."). The American Inventors' Protection Act of 1999 enacted a prior user defense to infringement of business method patent claims to protect those who had mistakenly thought commercialized business methods are not patentable. 35 U.S.C. § 273. In this act, Congress embraced both business methods and the Federal Circuit's *State Street Bank* "useful, concrete, and tangible result" test. 145 Cong. Rec. S14696-03, S14717 (daily ed. Nov. 17, 1999) ("As the Court [in State Street Bank] noted, the reference to the business method exception had been improperly applied to a wide variety of

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[1] *See, e.g.*, U.S. Patent No. 480,423 ("Method of Preventing Fraud in the Sale of Newspapers and Other Publications" (1892)); U.S Patent No. 575,731 ("Insurable Property Chart" (1897)); U.S. Patent No. 138,891 ("Revenue Stamps" (1873)).

processes, blurring the essential question of whether the invention produced a 'useful, concrete, and tangible result.'").

Enacting § 273, Congress further recognized that patents protect pure business methods that produce a useful end result, including:

> methods used in connection with internal commercial operations as well as those used in connection with the sale or transfer of useful end results—whether in the form of physical products, or in the form of services, or in the form of some other useful results; for example, results produced through the manipulation of data or other inputs to produce a useful result.

Id. Since enacting § 273, Congress has declined several opportunities to legislate in the area of business method patents. Three recent Congresses have considered bills to curtail business method patenting, but none has been enacted. *See* H.R. 5364, 106th Cong. (2000); H.R. 1332, 107th Cong. (2001); H.R. 5299, 108th Cong. (2004). Where Congress has declined to place limitations on patent-eligible subject matter, the courts should not impose them. *Chakrabarty*, 447 U.S. at 308; *Diehr*, 450 U.S. at 182.

Review by this Court is needed to stop the Federal Circuit and its "machine-or-transformation" test from confining business method patents to the manufacturing processes of America's past. To ensure liberal encouragement to the innovators of America's information economy, the petition for certiorari should be granted.

III. INTERPRETATION OF SECTION 101 IS A QUESTION OF EXCEPTIONAL IMPORTANCE TO BOTH THE PATENT SYSTEM AND THE NATION'S ECONOMY

The Federal Circuit's decision legislates new public policy that endangers innovation and upsets the settled expectations of patent owners and the inventing public. By narrowing patent eligibility to only those processes that satisfy the "machine-or-transformation" test, the Federal Circuit "links patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes." App., *infra*, 134a (Rader, J., dissenting). This policy shift calls into question the validity of thousands of issued patents and threatens to stifle innovation in emerging technologies that drive today's information-based economy. Moreover, mounting uncertainty over how the PTO and courts will apply the "machine-or-transformation" test threatens innovation in established fields that are central to the U.S. economy, such as computer software and biotechnology.

1. Patents encourage innovation. The intentional breadth of the Patent Act "embodie[s] Jefferson's philosophy that 'ingenuity should receive a liberal encouragement.'" *Chakrabarty*, 447 U.S. at 308-09 (quoting 5 WRITINGS OF THOMAS JEFFERSON 75-76 (Washington ed. 1871)). A recent study of global intellectual property protections found that eight of the top ten most innovative countries were also among the top ten in strength of patent protection. Edwin Lai, *Intellectual Property Protection in a Globalizing Era: Insights from the Federal Reserve Bank of Dallas*, ECONOMIC LETTER, Vol. 3, No. 3, at 5 (Mar. 2008). The study concluded that inadequate patent protection "greatly discouraged" innovation. *Id*. at 4.

With the decision below, the Federal Circuit threatens to impede innovation by retreating from its formerly technology-neutral position that "[t]he use of the expansive term 'any' in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35." *In re Alappat*, 33 F.3d 1526, 1542 (Fed. Cir. 1994) (en banc). This reversal is contrary to "U.S. law and policy [that] have embraced advances without regard to their subject matter. That promise of protection, in turn, fuels the research that, at least for now, makes this nation the world's innovation leader." App., *infra*, 137a (Rader, J., dissenting). *See also* Robert Greene Sterne & Lawrence B. Bugaisky, *The Expansion of Statutory Subject Matter Under the 1952 Patent Act*, 37 AKRON L. REV. 217, 225 (2004) (arguing that its lack of subject matter exclusions is the strength of the Patent Act).

Requiring processes to be tied to a machine or transform articles limits the patent incentives available to breakthroughs at the forefront of technology in fields known (*e.g.*, internet commerce, information technology, industrial engineering, bioinformatics) and unknown. Frontier innovations have always challenged the PTO and the courts, but their value has long been recognized. Innovations such as the telephone and telegraph were at first declared unpatentable by the PTO. *See* Sandra Szczerbicki, *The Shakedown on State Street*, 79 OR. L. REV. 253 (2000). Computer software and man-made bacterium faced similar obstacles. *Id*. at 254; *see also Chakrabarty*, 447 U.S. at 306. The Patent Act, however, was designed to accommodate and encourage just such unanticipated inventions. "Congress employed broad general language in drafting § 101 precisely because

such inventions are often unforeseeable." *Chakrabarty*, 447 U.S. at 316. Indeed, "[a] rule that unanticipated inventions are without protection would conflict with the core concept of the patent law that anticipation undermines patentability." *Id*.

2. The Federal Circuit decision is particularly harmful to innovations of the knowledge economy, which have been dominant contributors to economic growth. The "machine-or-transformation" test "excludes many of the kinds of inventions that apply today's electronic and photonic technologies, as well as other processes that handle data and information in novel ways. Such processes have long been patent eligible, and contribute to the vigor and variety of today's Information Age." App., *infra*, 60a (Newman, J., dissenting). Innovation in the knowledge economy thrives beyond the traditional scientific and engineering fields and includes new and useful business-related processes, which may or may not be implemented on a machine.

Some have estimated that denying patent protection to the innovations of the knowledge economy would exclude as much as seventy percent of the U.S. economy from patent protection. Jeffrey R. Kuester & Lawrence E. Thompson, *Risks Associated with Restricting Business Method and E-Commerce Patents*, 17 GA. ST. U. L. REV. 657, 683 (2001). Businesses related to the management of companies and enterprises contributed $271.3 billion to the U.S. gross domestic product in 2007, while the information technology industry contributed $586.3 billion. SOO JEONG KIM ET AL., U.S. DEP'T OF COM., ANNUAL INDUSTRY ACCOUNTS: SURVEY OF CURRENT BUSINESS 32 (Dec. 2008). Internet-based commerce reached $1 trillion in 2002 and was expected to increase to

nearly $6 trillion in 2006. JOHN GANTZ, ENABLING TOMORROW'S INNOVATION: AN IDC WHITE PAPER AND BSA CEO OPINION POLL *ii*. (Oct. 2003). Innovations in these fields involve organizations, human beings, and the flow of information. The "machine-or-transformation" test lacks the flexibility to adapt to these developments and provide the encouragement intended by the patent laws.

The Federal Circuit's decision denies patent eligibility to the very industries that are leading today's economic growth. At a time of a "widespread deceleration" in durable-goods manufacturing, the information technology and communications industries grew by 13%. KIM ET AL., *supra*, at 21, 23. Indeed, in 2007, overall GDP growth was led by industries including professional and business services and information technology. *Id*. at 23. Restricting § 101 to exclude patent eligibility in these fields runs counter to this Court's direction that "[t]he subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of Science and the useful Arts' with all that means for the social and economic benefits envisioned by Jefferson." *Chakrabarty*, 447 U.S. at 315.

3. The decision below ushers in a new, restrictive view of § 101, introducing uncertainties that "not only diminish the incentives available to new enterprise, but disrupt the settled expectations of those who relied on the law as it existed." App., *infra*, 61a (Newman, J., dissenting). Furthermore, "[a]dherence to settled law, resulting in settled expectations, is of particular importance 'in cases involving property . . . rights, where reliance interests are involved.'" *Id*. at 95a (Newman, J., dissenting) (quoting *Payne v. Ten-*

nessee, 501 U.S. 808, 828 (1991)). Congressional action is required to change such well-settled rules because "[f]undamental alterations in these rules risk destroying the legitimate expectations of inventors in their property." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722, 739 (2002).

The Federal Circuit's adoption of the "machine-or-transformation" test calls into question countless process patents issued before the PTO and Federal Circuit began applying this more restrictive test. This Court has more than once admonished that "courts must be cautious before adopting changes that disrupt the settled expectations of the inventing community." *Id.* at 739 (citing *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997)).

Like the doctrine of equivalents issue in *Festo*, the patentability of processes that apply a fundamental principle to produce a useful result was settled. Business methods were patentable before *State Street Bank*, and they remain patentable in accordance with Congress's intent, as evidenced by 35 U.S.C. § 273. *See State Street Bank*, 149 F.3d at 1375 (stating that a "business method exception has never been invoked by this court, or the CCPA, to deem an invention unpatentable"). Tens of thousands of patents have issued for business methods, software and information processes, and biotechnology methods. Just as this Court warned in *Festo*, "[t]o change so substantially the rules of the game now could very well subvert the various balances the PTO sought to strike when issuing the numerous patents which have not yet expired and which would be affected by our decision." 535 U.S. at 739 (quoting *Warner-Jenkinson*, 520 U.S. at 32 n.6). By requiring that process patents produce some physical transformation or be tied to a machine,

the Federal Circuit has ventured into territory reserved for the legislature and disrupted the settled expectations of patent owners and inventors alike.

4. While directed to a "business method," the Federal Circuit's decision threatens many of the nation's fundamental industries, including software and biotechnology.[2] The software industry is fundamental to the U.S. economy, representing billions of dollars and millions of jobs. A recent report by the Software and Information Industry Association revealed that the software and information industry generated $564 billion in 2005, outpacing traditional brick and mortar industries such as food manufacturing and computer and electronic products manufacturing. SOFTWARE & INFO. INDUS. ASS'N, SOFTWARE AND INFORMATION: DRIVING THE GLOBAL KNOWLEDGE ECONOMY 7-8 (2008).

As the software industry has grown, tens of thousands of software patents have issued and are currently in force. Indeed, the software industry report noted that "[t]he U.S. software and information industries depend on a meaningful international framework to protect the industries' intellectual property . . . ." *Id.* at 11. The *Bilski* decision casts doubt on these protections. Software patents that were examined and issued under a different standard for eligibility under § 101 are left vulnerable to attack. In a recent survey, software industry execu-

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[2] The importance of the question presented and its broad application beyond business methods is further evidenced by the extensive participation in the Federal Circuit by amicus curiae from diverse industries including financial services, management consulting, computer software, biotechnology, insurance, and tax accounting.

tives cautioned that adequate intellectual property protection is one of the top challenges to technology-based innovation. GANTZ, *supra*, at 12 (warning that "[i]f commercial software companies can't protect their work, investors won't invest, innovators won't invent and the IT sector won't be able to achieve its full economic potential.").

The *Bilski* decision also creates uncertainty for the biotechnology and pharmaceutical industries, which rely on patent protection to recoup hundreds of millions of dollars spent on research and development. The Federal Circuit has already relied on *Bilski* to invalidate claims in an issued patent for an immunization method. *Classen Immunotherapies, Inc. v. Biogen IDEC*, 2008 WL 5273107 (Fed. Cir. Dec. 19, 2008). Similarly, the PTO Board of Appeals has rejected an application for a diagnostic method involving an individual cornea of an eye. *Ex parte Roberts*, 2008 WL 2754746 (B.P.A.I. July 15, 2008). The uncertainties caused by the "machine-or-transformation" test are the "enemy of innovation." App., *infra*, 61a (Newman, J., dissenting).

5. The urgency of the issues involved in this case is underscored by the PTO's continuing struggle to apply the "machine-or-transformation" test. The PTO, in the Board's opinion and its Federal Circuit brief, acknowledged that it is struggling with the influx of patent applications for processes. App., *infra*, 151a; Br. for Appellee (June 13, 2007), at 4. It further recognized the importance of the issue and the need for guidance. App., *infra*, 151a, 154a; Br. for Appellee (June 13, 2007), at 4. The Federal Circuit majority opinion, however, and its adoption of the "machine-or-transformation" test, has not provided the needed guidance on this important issue.

Despite the Federal Circuit's holding that the "machine-or-transformation" test is the applicable test to determine whether a claim is drawn to a patent-eligible process under § 101, the PTO Board of Appeals has applied the test to non-method claims in several cases. *See, e.g.*, *Ex parte Godwin*, 2008 WL 4898213 (B.P.A.I. Nov. 13, 2008) (rejecting claims directed to a "portal server system" and a "portal server"); *Ex parte Noguchi*, 2008 WL 4968270 (B.P.A.I. Nov. 20, 2008) (rejecting claims to a "program for causing a computer connected to an external network to perform the functions of . . ."). The Board of Appeals has also interpreted *Bilski* as requiring that a process that transforms data must also be tied to a machine to establish patent eligibility, essentially applying a machine-and-transformation test. *See, e.g.*, *Ex parte Godwin* ("[T]he purported transformation of data, without a machine, is insufficient to establish patent-eligibility under § 101."); *Ex parte Noguchi* ("To the extent that Appellants' claims may transform data, we note that transformation of data, without a machine, is insufficient to establish patent-eligibility under § 101.")

In its attempt to find a "definitive" test for process patent eligibility, the Federal Circuit has disrupted settled expectations and called into question the validity of thousands of issued patents in industries central to the nation's economy. The issue in this case, i.e., the proper scope of patentable subject matter under § 101, is not only important to the nation's economy, it is "one of the broadest, most sweeping issues in patent law." *In re Comiskey*, __F.3d__, 2009 WL68845 at *16 n.2 (Fed. Cir. Jan. 13, 2009) (en banc) (order granting limited reh'g) (Moore, J., dissenting). The gravity of this issue warrants review by this Court.

IV. THIS CASE IS A GOOD VEHICLE FOR RESOLVING THE QUESTIONS PRESENTED

In the nearly thirty years since the Court last considered what can be patented under § 101, the U.S. economy has evolved from one tied to manufacturing to one based on information. Rather than allowing the flexible *Diehr* test to adapt to innovations of today's knowledge economy, the *Bilski* majority anchored patentable processes with its rigid "machine-or-transformation" test. As Circuit Judge Rader lamented, "as innovators seek the path to the next techno-revolution, [the Federal Circuit] ties our patent system to dicta from an industrial age decades removed from the bleeding edge." App., *infra*, 134a (Rader, J., dissenting). To restore the broad flexibility of § 101, this Court's review is needed.

This case presents the opportunity for the Court to address process claims under § 101, which it appeared ready to do when it granted, then dismissed, certiorari in *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124 (2006). *Bilski* now provides a good vehicle for such review. Unlike *Lab. Corp.*, the issue of patentable processes under § 101 was properly raised and thoroughly analyzed in both the PTO and the Federal Circuit.

The PTO has acknowledged that this is a good case for review. When the Bilski applicants appealed the patent examiner's rejections under § 101 to the PTO Board of Appeals, a three-judge panel of the Board heard oral arguments. Rather than decide the case based on that hearing, the Board held a second hearing before an expanded five-judge panel. App., *infra*, 146a & n.2. In its 70-page opinion, the enlarged panel explained that "[t]he question of whether this type of non-machine-implemented sub-

ject matter is patentable is a common and important one to the [PTO], as the bounds of patentable subject matter are increasingly being tested." *Id*. at 151a. In its brief to the Federal Circuit, the PTO welcomed the opportunity to resolve the "important question" presented and acknowledged that "the PTO has struggled to offer its examiners clear guidance on this issue." Br. for Appellee (June 13, 2007), at 4.

The Federal Circuit likewise chose this case as the vehicle to decide the important question of patent eligibility for processes and to overrule its prior decisions in *State Street Bank* and *AT&T*. The court recognized the broad applicability of the questions presented when it stayed other pending § 101 cases while deciding Bilski. *See In re Comiskey*, ___ F.3d ___, 2009 WL 68845 (Fed. Cir. Jan. 13, 2009) (staying consideration of petition for rehearing in case involving business method claims); *Prometheus Labs., Inc. v. May Collaborative Srvs*., No. 2008-1403 (Fed. Cir. July 29, 2008) (staying briefing in case involving diagnostic method claims). When the court finally decided *In re Comiskey*, ___ F.3d ___, 2009 WL 68845 (Fed. Cir. Jan. 13, 2009), the decision modified an earlier decision, 499 F.3d 1365 (Fed. Cir. 2007), which had been vacated by the en banc court and returned to the panel for correction. Although the need for correction alone might suggest some confusion at the Federal Circuit, the court ended up issuing four separate concurring and dissenting opinions from the denial of a more broad rehearing en banc. In dissent, Circuit Judge Newman objected that, even after *Bilski*, "[t]he court continues to present a broad and ill-defined exclusion of 'business methods' from access to the patent system, an exclusion that is poorly adapted to today's new and creative modalities of data handling and knowledge utilization." 2009 WL 68845

at *21. Simply put, the Federal Circuit's *Bilski* decision has not laid to rest the issues concerning patenting of business methods.

Because the Federal Circuit has exclusive jurisdiction over patent cases, there can be no split in the circuits on this issue. The several opinions below, however, have comprehensively explored the issues and the competing policies, so there is no need to wait for further development of the law. Rather, the sharply-divided opinions of the Federal Circuit show that what is needed now is guidance from this Court. Indeed, the en banc court essentially invited Supreme Court review of the "machine-or-transformation" test, acknowledging that the Court "may ultimately decide to alter or perhaps even set aside this test to accommodate emerging technologies." App., *infra*, 17a.

Moreover, there is unlikely to be a better case presented any time soon. As the PTO Board noted in this case, "[o]nly a very small fraction of the cases examined by the Examining Corps are ever appealed to the [PTO Board], and only a very small fraction of the rejections affirmed by the Board will ever be appealed to the Federal Circuit." App., *infra*, 153a; *see also Ex parte Lundgren*, 76 U.S.P.Q.2d 1385, 1389 (B.P.A.I. 2005) (Smith, J., dissenting) ("Unfortunately, the federal judiciary cannot get jurisdiction of this issue [i.e., patent eligibility for business methods] unless someone takes the issue to it."). The Court should take this opportunity to restore the law for patent eligibility of processes under 35 U.S.C. § 101.

CONCLUSION

For these reasons, the petition for a writ of certiorari should be granted.

Respectfully Submitted,

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APPENDIX A

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

No. 2007-1130
(Serial No. 08/833,892)

IN RE BERNARD L. BILSKI AND RAND A. WARSAW.

Appeal from the United States Patent and Trademark Office, Board of Patent Appeals and Interferences.

Oct. 30, 2008.

Before MICHEL, Chief Judge, NEWMAN, MAYER, LOURIE, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, PROST, and MOORE, Circuit Judges.

Opinion for the court filed by Chief Judge MICHEL, in which Circuit Judges LOURIE, SCHALL, BRYSON, GAJARSA, LINN, DYK, PROST, and MOORE join. Concurring opinion filed by Circuit Judge DYK, in which Circuit Judge LINN joins. Dissenting opinion filed by Circuit Judge NEWMAN. Dissenting opinion filed by Circuit Judge MAYER. Dissenting opinion filed by Circuit Judge RADER.

MICHEL, Chief Judge.

Bernard L. Bilski and Rand A. Warsaw (collectively, "Applicants") appeal from the final decision of the Board of Patent Appeals and Interferences ("Board") sustaining the rejection of all eleven claims

of their U.S. Patent Application Serial No. 08/833,892 (" '892 application"). See Ex parte Bilski, No.2002-2257, 2006 WL 5738364 (B.P.A.I. Sept. 26, 2006) ("Board Decision"). Specifically, Applicants argue that the examiner erroneously rejected the claims as not directed to patent-eligible subject matter under 35 U.S.C. § 101, and that the Board erred in upholding that rejection. The appeal was originally argued before a panel of the court on October 1, 2007. Prior to disposition by the panel, however, we sua sponte ordered en banc review. Oral argument before the en banc court was held on May 8, 2008. We affirm the decision of the Board because we conclude that Applicants' claims are not directed to patent-eligible subject matter, and in doing so, we clarify the standards applicable in determining whether a claimed method constitutes a statutory "process" under § 101.

I.

Applicants filed their patent application on April 10, 1997. The application contains eleven claims, which Applicants argue together here. Claim 1 reads:

> A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:
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> (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;
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> (b) identifying market participants for said commodity having a counter-risk position to said consumers; and

> (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions

'892 application cl.1. In essence, the claim is for a method of hedging risk in the field of commodities trading. For example, coal power plants (i.e., the "consumers") purchase coal to produce electricity and are averse to the risk of a spike in demand for coal since such a spike would increase the price and their costs. Conversely, coal mining companies (i.e., the "market participants") are averse to the risk of a sudden drop in demand for coal since such a drop would reduce their sales and depress prices. The claimed method envisions an intermediary, the "commodity provider," that sells coal to the power plants at a fixed price, thus isolating the power plants from the possibility of a spike in demand increasing the price of coal above the fixed price. The same provider buys coal from mining companies at a second fixed price, thereby isolating the mining companies from the possibility that a drop in demand would lower prices below that fixed price. And the provider has thus hedged its risk; if demand and prices skyrocket, it has sold coal at a disadvantageous price but has bought coal at an advantageous price, and vice versa if demand and prices fall. Importantly, however, the claim is not limited to transactions involving actual commodities, and the application discloses that the recited transactions may simply involve options, i.e., rights to purchase or sell the commodity at a particular price within a particular timeframe. See J.A. at 86-87.

The examiner ultimately rejected claims 1-11 under 35 U.S.C. § 101, stating: "[r]egarding ... claims 1-11, the invention is not implemented on a specific apparatus and merely manipulates [an] abstract idea and solves a purely mathematical problem without any limitation to a practical application, therefore, the invention is not directed to the technological arts." See Board Decision, slip op. at 3. The examiner noted that Applicants had admitted their claims are not limited to operation on a computer, and he concluded that they were not limited by any specific apparatus. See id. at 4.

On appeal, the Board held that the examiner erred to the extent he relied on a "technological arts" test because the case law does not support such a test. Id. at 41-42. Further, the Board held that the requirement of a specific apparatus was also erroneous because a claim that does not recite a specific apparatus may still be directed to patent-eligible subject matter "if there is a transformation of physical subject matter from one state to another." Id. at 42. Elaborating further, the Board stated: "'mixing' two elements or compounds to produce a chemical substance or mixture is clearly a statutory transformation although no apparatus is claimed to perform the step and although the step could be performed manually." Id. But the Board concluded that Applicants' claims do not involve any patent-eligible transformation, holding that transformation of "non-physical financial risks and legal liabilities of the commodity provider, the consumer, and the market participants" is not patent-eligible subject matter. Id. at 43. The Board also held that Applicants' claims "preempt[ ] any and every possible way of performing the steps of the [claimed process], by human or by any kind of machine or by any combination thereof,"

and thus concluded that they only claim an abstract idea ineligible for patent protection. Id. at 46-47. Finally, the Board held that Applicants' process as claimed did not produce a "useful, concrete and tangible result," and for this reason as well was not drawn to patent-eligible subject matter. Id. at 49-50.

Applicants timely appealed to this court under 35 U.S.C. § 141. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II.

Whether a claim is drawn to patent-eligible subject matter under § 101 is a threshold inquiry, and any claim of an application failing the requirements of § 101 must be rejected even if it meets all of the other legal requirements of patentability. In re Comiskey, 499 F.3d 1365, 1371 (Fed.Cir.2007)[1] (quoting Parker v. Flook, 437 U.S. 584, 593, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978)); In re Bergy, 596 F.2d 952, 960 (CCPA 1979), vacated as moot sub nom. Diamond v. Chakrabarty, 444 U.S. 1028, 100 S.Ct. 696, 62 L.Ed.2d 664 (1980). Whether a claim is drawn to patent-eligible subject matter under § 101 is an issue of law that we review de novo. Comiskey, 499 F.3d at

[1] Although our decision in Comiskey may be misread by some as requiring in every case that the examiner conduct a § 101 analysis before assessing any other issue of patentability, we did not so hold. As with any other patentability requirement, an examiner may reject a claim solely on the basis of § 101. Or, if the examiner deems it appropriate, she may reject the claim on any other ground(s) without addressing § 101. But given that § 101 is a threshold requirement, claims that are clearly drawn to unpatentable subject matter should be identified and rejected on that basis. Thus, an examiner should generally first satisfy herself that the application's claims are drawn to patent-eligible subject matter.

1373; AT&T Corp. v. Excel Commc'ns, Inc., 172 F.3d 1352, 1355 (Fed.Cir.1999). Although claim construction, which we also review de novo, is an important first step in a § 101 analysis, see State St. Bank & Trust Co. v. Signature Fin. Group, 149 F.3d 1368, 1370 (Fed.Cir.1998) (noting that whether a claim is invalid under § 101 "is a matter of both claim construction and statutory construction"), there is no claim construction dispute in this appeal. We review issues of statutory interpretation such as this one de novo as well. Id.

A.

As this appeal turns on whether Applicants' invention as claimed meets the requirements set forth in § 101, we begin with the words of the statute:

> 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 conditions and requirements of this title.

35 U.S.C. § 101. The statute thus recites four categories of patent-eligible subject matter: processes, machines, manufactures, and compositions of matter. It is undisputed that Applicants' claims are not directed to a machine, manufacture, or composition of matter.[2] Thus, the issue before us involves what the term "process" in § 101 means, and how to determine

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[2] As a result, we decline to discuss In re Nuijten because that decision primarily concerned whether a claim to an electronic signal was drawn to a patent-eligible manufacture. 500 F.3d 1346, 1356-57 (Fed.Cir.2007). We note that the PTO did not dispute that the process claims in Nuijten were drawn to patent-eligible subject matter under § 101 and allowed those claims.

whether a given claim—and Applicants' claim 1 in particular—is a "new and useful process."[3]

As several amici have argued, the term "process" is ordinarily broad in meaning, at least in general lay usage. In 1952, at the time Congress amended § 101 to include "process,"[4] the ordinary meaning of the term was: "[a] procedure ... [a] series of actions, motions, or operations definitely conducing to an end, whether voluntary or involuntary." WEBSTER'S NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE 1972 (2d ed.1952). There can be no dispute that Applicants' claim would meet this definition of "process." But the Supreme Court has held that the meaning of "process" as used in § 101 is narrower than its ordinary meaning. See Flook, 437 U.S. at 588-89, 98 S.Ct. 2522 ("The holding [in Benson] forecloses a purely literal reading of § 101."). Specifically, the Court has held that a claim is not a patent-eligible "process" if it claims "laws of nature, natural phenomena, [or] abstract ideas." Diamond v. Diehr, 450 U.S. 175, 185, 101 S.Ct. 1048, 67 L.Ed.2d 155

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[3] Congress provided a definition of "process" in 35 U.S.C. § 100(b): "The term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." However, this provision is unhelpful given that the definition itself uses the term "process."

[4] The Patent Act of 1793 originally used the term "art" rather than "process," which remained unchanged until Congress enacted the current version of § 101 in 1952. But the Supreme Court has held that this change did not alter the scope of patent eligibility over processes because "[i]n the language of the patent law, [a process] is an art." Diamond v. Diehr, 450 U.S. 175, 182-84, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) (quoting Cochrane v. Deener, 94 U.S. 780, 787-88, 24 L.Ed. 139 (1877)); see also Comiskey, 499 F.3d at 1375.

(1981) (citing Flook, 437 U.S. at 589, 98 S.Ct. 2522, and Gottschalk v. Benson, 409 U.S. 63, 67, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972)). Such fundamental principles[5] are "part of the storehouse of knowledge of all men ... free to all men and reserved exclusively to none." Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130, 68 S.Ct. 440, 92 L.Ed. 588 (1948); see also Le Roy v. Tatham, 55 U.S. (14 How.) 156, 175, 14 L.Ed. 367 (1852) ("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."). "Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." Benson, 409 U.S. at 67, 93 S.Ct. 253; see also Comiskey, 499 F.3d at 1378-79 (holding that "mental processes," "processes of human thinking," and "systems that depend for their operation on human intelligence alone" are not patent-eligible subject matter under Benson).

The true issue before us then is whether Applicants are seeking to claim a fundamental principle (such as an abstract idea) or a mental process. And the underlying legal question thus presented is what test or set of criteria governs the determination by the Patent and Trademark Office ("PTO") or courts as to whether a claim to a process is patentable under § 101 or, conversely, is drawn to unpatentable subject matter because it claims only a fundamental principle.

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[5] As used in this opinion, "fundamental principles" means "laws of nature, natural phenomena, and abstract ideas."

The Supreme Court last addressed this issue in 1981 in Diehr, which concerned a patent application seeking to claim a process for producing cured synthetic rubber products. 450 U.S. at 177-79, 101 S.Ct. 1048. The claimed process took temperature readings during cure and used a mathematical algorithm, the Arrhenius equation, to calculate the time when curing would be complete. Id. Noting that a mathematical algorithm alone is unpatentable because mathematical relationships are akin to a law of nature, the Court nevertheless held that the claimed process was patent-eligible subject matter, stating:

> [The inventors] do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek 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, 101 S.Ct. 1048 (emphasis added).[6] The Court declared that while a claim drawn to a fundamental principle is unpatentable, "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." Id. (emphasis in original); see also Mackay Radio & Tel. Co. v. Radio Corp. of Am., 306 U.S. 86, 94, 59 S.Ct. 427, 83 L.Ed. 506 (1939) ("While

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[6] Mathematical algorithms have, in other cases, been identified instead as abstract ideas rather than laws of nature. See, e.g., State St., 149 F.3d at 1373. Whether either or both views are correct is immaterial since both laws of nature and abstract ideas are unpatentable under § 101. Diehr, 450 U.S. at 185, 101 S.Ct. 1048.

a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.”).

The Court in Diehr thus drew a distinction between those claims that “seek to pre-empt the use of” a fundamental principle, on the one hand, and claims that seek only to foreclose others from using a particular “application” of that fundamental principle, on the other. 450 U.S. at 187, 101 S.Ct. 1048. Patents, by definition, grant the power to exclude others from practicing that which the patent claims. Diehr can be understood to suggest that whether a claim is drawn only to a fundamental principle is essentially an inquiry into the scope of that exclusion; i.e., whether the effect of allowing the claim would be to allow the patentee to pre-empt substantially all uses of that fundamental principle. If so, the claim is not drawn to patent-eligible subject matter.

In Diehr, the Court held that the claims at issue did not pre-empt all uses of the Arrhenius equation but rather claimed only “a process for curing rubber ... which incorporates in it a more efficient solution of the equation.” 450 U.S. at 188, 101 S.Ct. 1048. The process as claimed included several specific steps to control the curing of rubber more precisely: “These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.” Id. at 187, 101 S.Ct. 1048. Thus, one would still be able to use the Arrhenius equation in any process not involving curing rubber, and more importantly, even in any process to cure rubber that

did not include performing "all of the other steps in their claimed process." See id.; see also Tilghman v. Proctor, 102 U.S. 707, 729, 26 L.Ed. 279 (1880) (holding patentable a process of breaking down fat molecules into fatty acids and glycerine in water specifically requiring both high heat and high pressure since other processes, known or as yet unknown, using the reaction of water and fat molecules were not claimed).

In contrast to Diehr, the earlier Benson case presented the Court with claims drawn to a process of converting data in binary-coded decimal ("BCD") format to pure binary format via an algorithm programmed onto a digital computer. Benson, 409 U.S. at 65, 93 S.Ct. 253. The Court held the claims to be drawn to unpatentable subject matter:

> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.

Id. at 71-72, 93 S.Ct. 253 (emphasis added). Because the algorithm had no uses other than those that would be covered by the claims (i.e., any conversion of BCD to pure binary on a digital computer), the claims pre-empted all uses of the algorithm and thus they were effectively drawn to the algorithm itself. See also O'Reilly v. Morse, 56 U.S. (15 How.) 62, 113, 14 L.Ed. 601 (1853) (holding ineligible a claim pre-

empting all uses of electromagnetism to print characters at a distance).

The question before us then is whether Applicants' claim recites a fundamental principle and, if so, whether it would pre-empt substantially all uses of that fundamental principle if allowed. Unfortunately, this inquiry is hardly straightforward. How does one determine whether a given claim would pre-empt all uses of a fundamental principle? Analogizing to the facts of Diehr or Benson is of limited usefulness because the more challenging process claims of the twenty-first century are seldom so clearly limited in scope as the highly specific, plainly corporeal industrial manufacturing process of Diehr; nor are they typically as broadly claimed or purely abstract and mathematical as the algorithm of Benson.

The Supreme Court, however, has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-empt the principle itself. A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. See Benson, 409 U.S. at 70, 93 S.Ct. 253 ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."); Diehr, 450 U.S. at 192, 101 S.Ct. 1048 (holding that use of mathematical formula in process "transforming or reducing an article to a different state or thing" constitutes patent-eligible subject matter); see also Flook, 437 U.S. at 589 n. 9, 98 S.Ct. 2522 ("An argument can be made [that the Supreme] 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'"); Cochrane v. Deener, 94 U.S. 780, 788, 24 L.Ed. 139 (1876) ("A process is ... an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.").[7] A claimed process involving a fundamental principle that uses a particular machine or apparatus would not pre-empt uses of the principle that do not also use the specified machine or apparatus in the manner claimed. And a claimed process that transforms a particular article to a specified different state or thing by applying a fundamental principle would not pre-empt the use of the principle to transform any other article, to transform the same article but in a manner not covered by the claim, or to do anything other than transform the specified article.

The process claimed in Diehr, for example, clearly met both criteria. The process operated on a computerized rubber curing apparatus and transformed raw, uncured rubber into molded, cured rubber products. Diehr, 450 U.S. at 184, 187, 101 S.Ct. 1048. The claim at issue in Flook, in contrast, was directed to using a particular mathematical formula to calculate an "alarm limit"—a value that would indicate an abnormal condition during an unspecified chemical reaction. 437 U.S. at 586, 98 S.Ct. 2522. The Court rejected the claim as drawn to the formula itself because the claim did not include any limitations

[7] While the Court did not give explicit definitions of terms such as "tied to," "transforms," or "article," a careful analysis of its opinions and the subsequent jurisprudence of this court applying those decisions, discussed infra, informs our understanding of the Court's machine-or-transformation test.

specifying "how to select the appropriate margin of safety, the weighting factor, or any of the other variables ... the chemical processes at work, the [mechanism for] monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system." See id. at 586, 595, 98 S.Ct. 2522. The claim thus was not limited to any particular chemical (or other) transformation; nor was it tied to any specific machine or apparatus for any of its process steps, such as the selection or monitoring of variables or the setting off or adjusting of the alarm.[8] See id.

A canvas of earlier Supreme Court cases reveals that the results of those decisions were also consistent with the machine-or-transformation test later articulated in Benson and reaffirmed in Diehr. See Tilghman, 102 U.S. at 729 (particular process of transforming fats into constituent compounds held patentable); Cochrane, 94 U.S. at 785-88 (process transforming grain meal into purified flour held patentable); Morse, 56 U.S. (15 How.) at 113 (process of using electromagnetism to print characters at a distance that was not transformative or tied to any particular apparatus held unpatentable). Interestingly, Benson presents a difficult case under its own test in that the claimed process operated on a machine, a digital computer, but was still held to be ineligible

[8] To the extent it may be argued that Flook did not explicitly follow the machine-or-transformation test first articulated in Benson, we note that the more recent decision in Diehr reaffirmed the machine-or-transformation test. See Diehr, 450 U.S. at 191-92, 101 S.Ct. 1048. Moreover, the Diehr Court explained that Flook "presented a similar situation" to Benson and considered it consistent with the holdings of Diehr and Benson. Diehr at 186-87, 189, 191-92, 101 S.Ct. 1048. We thus follow the Diehr Court's understanding of Flook.

subject matter.[9] However, in Benson, the limitations tying the process to a computer were not actually limiting because the fundamental principle at issue, a particular algorithm, had no utility other than operating on a digital computer. Benson, 409 U.S. at 71-72, 93 S.Ct. 253. Thus, the claim's tie to a digital computer did not reduce the pre-emptive footprint of the claim since all uses of the algorithm were still covered by the claim.

B.

Applicants and several amici[10] have argued that the Supreme Court did not intend the machine-or-transformation test to be the sole test governing § 101 analyses. As already noted, however, the Court explicitly stated in Benson that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."[11] 409 U.S. at

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[9] We acknowledge that the Supreme Court in Benson stated that the claims at issue "were not limited ... to any particular apparatus or machinery." 409 U.S. at 64, 93 S.Ct. 253. However, the Court immediately thereafter stated: "[The claims] purported to cover any use of the claimed method in a general-purpose digital computer of any type." Id. And, as discussed herein, the Court relied for its holding on its understanding that the claimed process pre-empted all uses of the recited algorithm because its only possible use was on a digital computer. Id. at 71-72, 93 S.Ct. 253. The Diehr Court, in discussing Benson, relied only on this latter understanding of the Benson claims. See Diehr, 450 U.S. at 185-87, 101 S.Ct. 1048. We must do the same.

[10] See, e.g., Br. of Amicus Curiae Am. Intellectual Prop. Law Ass'n at 17-21; Br. of Amicus Curiae Regulatory Datacorp, Inc. at 10-15.

[11] We believe that the Supreme Court spoke of the machine-or-transformation test as the "clue" to patent-eligibility because

70, 93 S.Ct. 253 (emphasis added). And the Court itself later noted in Flook that at least so far it had "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.'" 437 U.S. at 589 n. 9, 98 S.Ct. 2522. Finally, the Court in Diehr once again applied the machine-or-transformation test in its most recent decision regarding the patentability of processes under § 101. 450 U.S. at 184, 101 S.Ct. 1048.

We recognize, however, that the Court was initially equivocal in first putting forward this test in Benson. As the Applicants and several amici point out, the Court there stated:

> 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.

Benson, 409 U.S. at 71, 93 S.Ct. 253. In Flook, the Court took note that this statement had been made in Benson but merely stated: "As in Benson, we assume that a valid process patent may issue even if it does not meet [the machine-or-transformation test]." 437 U.S. at 589 n. 9, 98 S.Ct. 2522 (emphasis added). And this caveat was not repeated in Diehr

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the test is the tool used to determine whether a claim is drawn to a statutory "process"-the statute does not itself explicitly mention machine implementation or transformation. We do not consider the word "clue" to indicate that the machine-or-implementation test is optional or merely advisory. Rather, the Court described it as the clue, not merely "a" clue. See Benson, 409 U.S. at 70, 93 S.Ct. 253.

when the Court reaffirmed the machine-or-transformation test. See Diehr, 450 U.S. at 184, 101 S.Ct. 1048 (quoting Benson, 409 U.S. at 70, 93 S.Ct. 253) ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."). Therefore, we believe our reliance on the Supreme Court's machine-or-transformation test as the applicable test for § 101 analyses of process claims is sound.

Nevertheless, we agree that future developments in technology and the sciences may present difficult challenges to the machine-or-transformation test, just as the widespread use of computers and the advent of the Internet has begun to challenge it in the past decade. Thus, we recognize that the Supreme Court may ultimately decide to alter or perhaps even set aside this test to accommodate emerging technologies. And we certainly do not rule out the possibility that this court may in the future refine or augment the test or how it is applied. At present, however, and certainly for the present case, we see no need for such a departure and reaffirm that the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under § 101.[12]

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[12] The Diehr Court stated: "[W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." 450 U.S at 192, 101 S.Ct. 1048 (emphases added). When read together with Benson and Flook, on which the Diehr Court firmly relied, we believe this statement is consistent with the machine-or-transformation test. But as we noted in AT & T,

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As a corollary, the Diehr Court also held that mere field-of-use limitations are generally insufficient to render an otherwise ineligible process claim patent-eligible. See 450 U.S. at 191-92, 101 S.Ct. 1048 (noting that ineligibility under § 101 "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment"). We recognize that tension may be seen between this consideration and the Court's overall goal of pre-venting the wholesale pre-emption of fundamental principles. Why not permit patentees to avoid overbroad pre-emption by limiting claim scope to particular fields of use? This tension is resolved, however, by recalling the purpose behind the Supreme Court's discussion of pre-emption, namely that pre-emption is merely an indication that a claim seeks to cover a fundamental principle itself rather than only a specific application of that principle. See id. at 187, 101 S.Ct. 1048; Benson, 409 U.S. at 71-72, 93 S.Ct. 253. Pre-emption of all uses of a fundamental principle in all fields and pre-emption of all uses of the principle in only one field both indicate that the claim is not limited to a particular application of the principle. See Diehr, 450 U.S. at 193 n. 14, 101 S.Ct. 1048 ("A mathematical formula in the abstract is nonstatutory subject matter regardless of whether the patent is intended to cover all uses of the formula or only limited uses.") (emphasis added). In contrast, a claim that is tied to a particular machine or brings about a particular transformation of a particular article does not pre-

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language such as the use of "e.g." may indicate the Supreme Court's recognition that the machine-or-transformation test might require modification in the future. See AT & T, 172 F.3d at 1358-59.

empt all uses of a fundamental principle in any field but rather is limited to a particular use, a specific application. Therefore, it is not drawn to the principle in the abstract.

The Diehr Court also reaffirmed a second corollary to the machine-or-transformation test by stating that "insignificant postsolution activity will not transform an unpatentable principle into a patentable process." Id. at 191-92, 101 S.Ct. 1048; see also Flook, 437 U.S. at 590, 98 S.Ct. 2522 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). The Court in Flook reasoned:

> A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.

437 U.S. at 590, 98 S.Ct. 2522.[13] Therefore, even if a claim recites a specific machine or a particular transformation of a specific article, the recited machine or transformation must not constitute mere "insignificant postsolution activity."[14]

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[13] The example of the Pythagorean theorem applied to surveying techniques could also be considered an example of a mere field-of-use limitation.

[14] Although the Court spoke of "postsolution" activity, we have recognized that the Court's reasoning is equally applicable to any insignificant extra-solution activity regardless of where and when it appears in the claimed process. See In re Schrader, 22

D.

We discern two other important aspects of the Supreme Court's § 101 jurisprudence. First, the Court has held that whether a claimed process is novel or non-obvious is irrelevant to the § 101 analysis. Diehr, 450 U.S. at 188-91, 101 S.Ct. 1048. Rather, such considerations are governed by 35 U.S.C. § 102 (novelty) and § 103 (non-obviousness). Diehr, 450 U.S. at 188-91, 101 S.Ct. 1048. Although § 101 refers to "new and useful" processes, it is overall "a general statement of the type of subject matter that is eligible for patent protection 'subject to the conditions and requirements of this title.'" Diehr, 450 U.S. at 189, 101 S.Ct. 1048 (quoting § 101). As the legislative history of § 101 indicates, Congress did not intend the "new and useful" language of § 101 to constitute an independent requirement of novelty or non-obviousness distinct from the more specific and detailed requirements of §§ 102 and 103, respectively. Diehr, 450 U.S. at 190-91, 101 S.Ct. 1048.[15] So here, it is irrelevant to the § 101 analysis whether Applicants' claimed process is novel or non-obvious.

Second, the Court has made clear that it is inappropriate to determine the patent-eligibility of a claim as a whole based on whether selected limita-

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F.3d 290, 294 (Fed.Cir.1994) (holding a simple recordation step in the middle of the claimed process incapable of imparting patent-eligibility under § 101); In re Grams, 888 F.2d 835, 839-40 (Fed.Cir.1989) (holding a pre-solution step of gathering data incapable of imparting patent-eligibility under § 101).

[15] By the same token, considerations of adequate written description, enablement, best mode, etc., are also irrelevant to the § 101 analysis because they, too, are governed by other provisions of the Patent Act. Section 101 does, however, allow for patents only on useful inventions. Brenner v. Manson, 383 U.S. 519, 532-35, 86 S.Ct. 1033, 16 L.Ed.2d 69 (1966).

tions constitute patent-eligible subject matter. Flook, 437 U.S. at 594, 98 S.Ct. 2522 ("Our approach to respondent's application is, however, not at all inconsistent with the view that a patent claim must be considered as a whole."); Diehr, 450 U.S. at 188, 101 S.Ct. 1048 ("It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis."). After all, even though a fundamental principle itself is not patent-eligible, processes incorporating a fundamental principle may be patent-eligible. Thus, it is irrelevant that any individual step or limitation of such processes by itself would be unpatentable under § 101. See In re Alappat, 33 F.3d 1526, 1543-44 (Fed.Cir.1994) (en banc) (citing Diehr, 450 U.S. at 187, 101 S.Ct. 1048).

III.

In the years following the Supreme Court's decisions in Benson, Flook, and Diehr, our predecessor court and this court have reviewed numerous cases presenting a wide variety of process claims, some in technology areas unimaginable when those seminal Supreme Court cases were heard.[16] Looking to these precedents, we find a wealth of detailed guidance and helpful examples on how to determine the patent-eligibility of process claims.

A.

Before we turn to our precedents, however, we first address the issue of whether several other purported

[16] We note that the PTO, too, has been active in analyzing § 101 law. See, e.g., Ex parte Lundgren, 76 U.S.P.Q.2d 1385 (B.P.A.I.2004); Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, Off. Gaz. Pat. & Trademark Office, Nov. 22, 2005.

articulations of § 101 tests are valid and useful. The first of these is known as the Freeman-Walter-Abele test after the three decisions of our predecessor court that formulated and then refined the test: In re Freeman, 573 F.2d 1237 (CCPA 1978); In re Walter, 618 F.2d 758 (CCPA 1980); and In re Abele, 684 F.2d 902 (CCPA 1982). This test, in its final form, had two steps: (1) determining whether the claim recites an "algorithm" within the meaning of Benson, then (2) determining whether that algorithm is "applied in any manner to physical elements or process steps." Abele, 684 F.2d at 905-07.

Some may question the continued viability of this test, arguing that it appears to conflict with the Supreme Court's proscription against dissecting a claim and evaluating patent-eligibility on the basis of individual limitations. See Flook, 437 U.S. at 594, 98 S.Ct. 2522 (requiring analysis of claim as a whole in § 101 analysis); see also AT & T, 172 F.3d at 1359; State St., 149 F.3d at 1374. In light of the present opinion, we conclude that the Freeman-Walter-Abele test is inadequate. Indeed, we have already recognized that a claim failing that test may nonetheless be patent-eligible. See In re Grams, 888 F.2d 835, 838-39 (Fed.Cir.1989). Rather, the machine-or-transformation test is the applicable test for patent-eligible subject matter.[17]

The second articulation we now revisit is the "useful, concrete, and tangible result" language associated with State Street, although first set forth in

[17] Therefore, in Abele, Meyer, Grams, Arrhythmia Research Technology, Inc. v. Corazonix Corp., 958 F.2d 1053 (Fed.Cir. 1992), and other decisions, those portions relying solely on the Freeman-Walter-Abele test should no longer be relied on.

Alappat. State St., 149 F.3d at 1373 ("Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a [patent-eligible invention] because it produces 'a useful, concrete and tangible result'....");[18] Alappat, 33 F.3d at 1544 ("This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result."); see also AT & T, 172 F.3d at 1357 ("Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of § 101."). The basis for this language in State Street and Alappat was that the Supreme Court has explained that "certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application." Alappat, 33 F.3d at 1543; see also State St., 149 F.3d at 1373. To be sure, a process tied to a particular machine, or transforming or reducing a particular article into a different state or thing, will generally produce a "concrete" and "tangible" result as those terms were used in our prior decisions. But while looking for "a useful, concrete and tangible result" may in many instances provide useful indications of whether a claim is drawn to a fundamental principle or a practical application of such a principle,

[18] In State Street, as is often forgotten, we addressed a claim drawn not to a process but to a machine. 149 F.3d at 1371-72 (holding that the means-plus-function elements of the claims on appeal all corresponded to supporting structures disclosed in the written description).

that inquiry is insufficient to determine whether a claim is patent-eligible under § 101. And it was certainly never intended to supplant the Supreme Court's test. Therefore, we also conclude that the "useful, concrete and tangible result" inquiry is inadequate and reaffirm that the machine-or-transformation test outlined by the Supreme Court is the proper test to apply.[19]

We next turn to the so-called "technological arts test" that some amici[20] urge us to adopt. We perceive that the contours of such a test, however, would be unclear because the meanings of the terms "technological arts" and "technology" are both ambiguous and ever-changing.[21] And no such test has ever been explicitly adopted by the Supreme Court, this court, or our predecessor court, as the Board correctly observed here. Therefore, we decline to do so and con-

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[19] As a result, those portions of our opinions in State Street and AT & T relying solely on a "useful, concrete and tangible result" analysis should no longer be relied on.

[20] See, e.g., Br. of Amicus Curiae Consumers Union et al. at 6-10; Br. of Amicus Curiae William Mitchell Coll. of Law Intellectual Prop.Inst. at 14-15.

[21] Compare Appellee's Br. at 24-28 (arguing that patents should be reserved only for "technological" inventions that "involve[ ] the application of science or mathematics," thereby excluding "non-technological inventions" such as "activities whose ability to achieve their claimed goals depended solely on contract formation"), with Br. of Amicus Curiae Regulatory Datacorp, Inc. at 19-24 (arguing that "innovations in business, finance, and other applied economic fields plainly qualify as 'technological'" since "a fair definition of technological is 'characterized by the practical application of knowledge in a particular field'" and because modern economics has "a closer affinity to physics and engineering than to liberal arts like English literature").

tinue to rely on the machine-or-transformation test as articulated by the Supreme Court.

We further reject calls for categorical exclusions beyond those for fundamental principles already identified by the Supreme Court.[22] We rejected just such an exclusion in State Street, noting that the so-called "business method exception" was unlawful and that business method claims (and indeed all process claims) are "subject to the same legal requirements for patentability as applied to any other process or method." 149 F.3d at 1375-76. We reaffirm this conclusion.[23]

Lastly, we address a possible misunderstanding of our decision in Comiskey. Some may suggest that Comiskey implicitly applied a new § 101 test that bars any claim reciting a mental process that lacks significant "physical steps." We did not so hold, nor did we announce any new test at all in Comiskey. Rather, we simply recognized that the Supreme Court has held that mental processes, like fundamental principles, are excluded by § 101 because "'[p]henomena of nature, though just discovered,

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[22] See, e.g., Br. of Amicus Curiae Fin. Servs. Indus. at 20 ("[E]xtending patent protection to pure methods of doing business ... is contrary to the constitutional and statutory basis for granting patent monopolies....").

[23] Therefore, although invited to do so by several amici, we decline to adopt a broad exclusion over software or any other such category of subject matter beyond the exclusion of claims drawn to fundamental principles set forth by the Supreme Court. See, e.g., Br. of Amicus Curiae End Software Patents; Br. of Amicus Curiae Red Hat, Inc. at 4-7. We also note that the process claim at issue in this appeal is not, in any event, a software claim. Thus, the facts here would be largely unhelpful in illuminating the distinctions between those software claims that are patent-eligible and those that are not.

mental processes, and abstract intellectual concepts ... are the basic tools of scientific and technological work.'" Comiskey, 499 F.3d at 1377 (quoting Benson, 409 U.S. at 67, 93 S.Ct. 253) (emphasis added). And we actually applied the machine-or-transformation test to determine whether various claims at issue were drawn to patent-eligible subject matter.[24] Id. at 1379 ("Comiskey has conceded that these claims do not require a machine, and these claims evidently do not describe a process of manufacture or a process for the alteration of a composition of matter."). Because those claims failed the machine-or-transformation test, we held that they were drawn solely to a fundamental principle, the mental process of arbitrating a dispute, and were thus not patent-eligible under § 101. Id.

Further, not only did we not rely on a "physical steps" test in Comiskey, but we have criticized such an approach to the § 101 analysis in earlier decisions. In AT & T, we rejected a "physical limitations" test and noted that "the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter." 172 F.3d at 1359 (quoting State St., 149 F.3d at 1374). The same reasoning applies when the claim at issue recites fundamental principles other than

[24] Our statement in Comiskey that "a claim reciting an algorithm or abstract idea can state statutory subject matter only if, as employed in the process, it is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter," 499 F.3d at 1376, was simply a summarization of the Supreme Court's machine-or-transformation test and should not be understood as altering that test.

mathematical algorithms. Thus, the proper inquiry under § 101 is not whether the process claim recites sufficient "physical steps," but rather whether the claim meets the machine-or-transformation test.[25] As a result, even a claim that recites "physical steps" but neither recites a particular machine or apparatus, nor transforms any article into a different state or thing, is not drawn to patent-eligible subject matter. Conversely, a claim that purportedly lacks any "physical steps" but is still tied to a machine or achieves an eligible transformation passes muster under § 101.[26]

B.

With these preliminary issues resolved, we now turn to how our case law elaborates on the § 101 analysis set forth by the Supreme Court. To the extent that some of the reasoning in these decisions relied on considerations or tests, such as "useful, concrete and tangible result," that are no longer valid as explained above, those aspects of the decisions should no longer be relied on. Thus, we reexamine the facts of certain cases under the correct test to glean greater guidance as to how to perform the § 101 analysis using the machine-or-transformation test.

The machine-or-transformation test is a two-branched inquiry; an applicant may show that a

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[25] Thus, it is simply inapposite to the § 101 analysis whether process steps performed by software on a computer are sufficiently "physical."

[26] Of course, a claimed process wherein all of the process steps may be performed entirely in the human mind is obviously not tied to any machine and does not transform any article into a different state or thing. As a result, it would not be patent-eligible under § 101.

process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article. See Benson, 409 U.S. at 70, 93 S.Ct. 253. Certain con-siderations are applicable to analysis under either branch. First, as illustrated by Benson and discussed below, the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility. See Benson, 409 U.S. at 71-72, 93 S.Ct. 253. Second, the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity. See Flook, 437 U.S. at 590, 98 S.Ct. 2522.

As to machine implementation, Applicants themselves admit that the language of claim 1 does not limit any process step to any specific machine or apparatus. See Appellants' Br. at 11. As a result, issues specific to the machine implementation part of the test are not before us today. We leave to future cases the elaboration of the precise contours of machine implementation, as well as the answers to particular questions, such as whether or when recitation of a computer suffices to tie a process claim to a particular machine.

We will, however, consider some of our past cases to gain insight into the transformation part of the test. A claimed process is patent-eligible if it transforms an article into a different state or thing. This transformation must be central to the purpose of the claimed process. But the main aspect of the transformation test that requires clarification here is what sorts of things constitute "articles" such that their transformation is sufficient to impart patent-eligibility under § 101. It is virtually self-evident that a process for a chemical or physical transformation of

physical objects or substances is patent-eligible subject matter. As the Supreme Court stated in Benson:

> [T]he arts of tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores ... are instances, however, where the use of chemical sub-stances or physical acts, such as temperature control, changes articles or materials. The chemical process or the physical acts which transform the raw material are, however, sufficiently definite to confine the patent monopoly within rather definite bounds.

409 U.S. at 70, 93 S.Ct. 253 (quoting Corning v. Burden, 56 U.S. (15 How.) 252, 267-68, 14 L.Ed. 683 (1854)); see also Diehr, 450 U.S. at 184, 101 S.Ct. 1048 (process of curing rubber); Tilghman, 102 U.S. at 729 (process of reducing fats into constituent acids and glycerine).

The raw materials of many information-age processes, however, are electronic signals and electronically-manipulated data. And some so-called business methods, such as that claimed in the present case, involve the manipulation of even more abstract constructs such as legal obligations, organizational relationships, and business risks. Which, if any, of these processes qualify as a transformation or reduction of an article into a different state or thing constituting patent-eligible subject matter?

Our case law has taken a measured approach to this question, and we see no reason here to expand the boundaries of what constitutes patent-eligible transformations of articles.

Our predecessor court's mixed result in Abele illustrates this point. There, we held unpatentable a broad independent claim reciting a process of graphi-

cally displaying variances of data from average values. Abele, 684 F.2d at 909. That claim did not specify any particular type or nature of data; nor did it specify how or from where the data was obtained or what the data represented. Id.; see also In re Meyer, 688 F.2d 789, 792-93 (CCPA 1982) (process claim involving undefined "complex system" and indeterminate "factors" drawn from unspecified "testing" not patent-eligible). In contrast, we held one of Abele's dependent claims to be drawn to patent-eligible subject matter where it specified that "said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner." Abele, 684 F.2d at 908-09. This data clearly represented physical and tangible objects, namely the structure of bones, organs, and other body tissues. Thus, the transformation of that raw data into a particular visual depiction of a physical object on a display was sufficient to render that more narrowly-claimed process patent-eligible.

We further note for clarity that the electronic transformation of the data itself into a visual depiction in Abele was sufficient; the claim was not required to involve any transformation of the underlying physical object that the data represented. We believe this is faithful to the concern the Supreme Court articulated as the basis for the machine-or-transformation test, namely the prevention of preemption of fundamental principles. So long as the claimed process is limited to a practical application of a fundamental principle to transform specific data, and the claim is limited to a visual depiction that represents specific physical objects or substances, there is no danger that the scope of the claim would wholly pre-empt all uses of the principle.

This court and our predecessor court have frequently stated that adding a data-gathering step to an algorithm is insufficient to convert that algorithm into a patent-eligible process. E.g., Grams, 888 F.2d at 840 (step of "deriv[ing] data for the algorithm will not render the claim statutory"); Meyer, 688 F.2d at 794 ("[data-gathering] step[s] cannot make an otherwise nonstatutory claim statutory"). For example, in Grams we held unpatentable a process of performing a clinical test and, based on the data from that test, determining if an abnormality existed and possible causes of any abnormality. 888 F.2d at 837, 841. We rejected the claim because it was merely an algorithm combined with a data-gathering step. Id. at 839-41. We note that, at least in most cases, gathering data would not constitute a transformation of any article. A requirement simply that data inputs be gathered-without specifying how-is a meaningless limit on a claim to an algorithm because every algorithm inherently requires the gathering of data inputs. Grams, 888 F.2d at 839-40. Further, the inherent step of gathering data can also fairly be characterized as insignificant extra-solution activity. See Flook, 437 U.S. at 590, 98 S.Ct. 2522.

Similarly, In re Schrader presented claims directed to a method of conducting an auction of multiple items in which the winning bids were selected in a manner that maximized the total price of all the items (rather than to the highest individual bid for each item separately). 22 F.3d 290, 291 (Fed.Cir. 1994). We held the claims to be drawn to unpatentable subject matter, namely a mathematical optimization algorithm. Id. at 293-94. No specific machine or apparatus was recited. The claimed method did require a step of recording the bids on each item, though no particular manner of recording (e.g., on

paper, on a computer) was specified. Id. But, relying on Flook, we held that this step constituted insignificant extra-solution activity. Id. at 294.

IV.

We now turn to the facts of this case. As outlined above, the operative question before this court is whether Applicants' claim 1 satisfies the transformation branch of the machine-or-transformation test.

We hold that the Applicants' process as claimed does not transform any article to a different state or thing. Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances. Applicants' process at most incorporates only such ineligible transformations. See Appellants' Br. at 11 ("[The claimed process] transforms the relationships be-tween the commodity provider, the consumers and market participants ....") As discussed earlier, the process as claimed encompasses the exchange of only options, which are simply legal rights to purchase some commodity at a given price in a given time period. See J.A. at 86-87. The claim only refers to "transactions" involving the exchange of these legal rights at a "fixed rate corresponding to a risk position." See '892 application cl.1. Thus, claim 1 does not involve the transformation of any physical object or substance, or an electronic signal representative of any physical object or substance. Given its admitted failure to meet the machine implementation part of the test as well, the claim entirely fails the machine-or-transformation test and is not drawn to patent-eligible subject matter.

Applicants' arguments are unavailing because they rely on incorrect or insufficient considerations and do not address their claim's failure to meet the requirements of the Supreme Court's machine-or-trans-formation test. First, they argue that claim 1 pro-duces "useful, concrete and tangible results." But as already discussed, this is insufficient to establish patent-eligibility under § 101. Applicants also argue that their claimed process does not comprise only "steps that are totally or substantially practiced in the mind but clearly require physical activity which have [sic] a tangible result." Appellants' Br. at 9. But as previously discussed, the correct analysis is whether the claim meets the machine-or-transformation test, not whether it recites "physical steps." Even if it is true that Applicant's claim "can only be practiced by a series of physical acts" as they argue, see id. at 9, its clear failure to satisfy the machine-or-transformation test is fatal. Thus, while we agree with Applicants that the only limit to patent-eligibility imposed by Congress is that the invention fall within one of the four categories enumerated in § 101, we must apply the Supreme Court's test to determine whether a claim to a process is drawn to a statutory "process" within the meaning of § 101. Applied here, Applicants' claim fails that test so it is not drawn to a "process" under § 101 as that term has been interpreted.

On the other hand, while we agree with the PTO that the machine-or-transformation test is the correct test to apply in determining whether a process claim is patent-eligible under § 101, we do not agree, as discussed earlier, that this amounts to a "technological arts" test. See Appellee's Br. at 24-28. Neither the PTO nor the courts may pay short shrift to the machine-or-transformation test by using purported

equivalents or shortcuts such as a "technological arts" requirement. Rather, the machine-or-transformation test is the only applicable test and must be applied, in light of the guidance provided by the Supreme Court and this court, when evaluating the patent-eligibility of process claims. When we do so here, however, we must conclude, as the PTO did, that Applicants' claim fails the test.

Applicants' claim is similar to the claims we held unpatentable under § 101 in Comiskey. There, the applicant claimed a process for mandatory arbitration of disputes regarding unilateral documents and bilateral "contractual" documents in which arbitration was required by the language of the document, a dispute regarding the document was arbitrated, and a binding decision resulted from the arbitration. Comiskey, 499 F.3d at 1368-69. We held the broadest process claims unpatentable under § 101 because "these claims do not require a machine, and these claims evidently do not describe a process of manufacture or a process for the alteration of a composition of matter." Id. at 1379. We concluded that the claims were instead drawn to the "mental process" of arbitrating disputes, and that claims to such an "application of [only] human intelligence to the solution of practical problems" is no more than a claim to a fundamental principle. Id. at 1377-79 (quoting Benson, 409 U.S. at 67, 93 S.Ct. 253 ("[M]ental processes, and abstract intellectual con-cepts are not patentable, as they are the basic tools of scientific and technological work.")).

Just as the Comiskey claims as a whole were directed to the mental process of arbitrating a dispute to decide its resolution, the claimed process here as a whole is directed to the mental and mathematical

process of identifying transactions that would hedge risk. The fact that the claim requires the identified transactions actually to be made does no more to alter the character of the claim as a whole than the fact that the claims in Comiskey required a decision to actually be rendered in the arbitration-i.e., in neither case do the claims require the use of any particular machine or achieve any eligible transformation.

We have in fact consistently rejected claims like those in the present appeal and in Comiskey. For example, in Meyer, the applicant sought to patent a method of diagnosing the location of a malfunction in an unspecified multi-component system that assigned a numerical value, a "factor," to each component and updated that value based on diagnostic tests of each component. 688 F.2d at 792-93. The locations of any malfunctions could thus be deduced from reviewing these "factors." The diagnostic tests were not identified, and the "factors" were not tied to any particular measurement; indeed they could be arbitrary. Id. at 790. We held that the claim was effectively drawn only to "a mathematical algorithm representing a mental process," and we affirmed the PTO's rejection on § 101 grounds. Id. at 796. No machine was recited in the claim, and the only potential "transformation" was of the disembodied "factors" from one number to another. Thus, the claim effectively sought to preempt the fundamental mental process of diagnosing the location of a malfunction in a system by noticing that the condition of a particular component had changed. And as discussed earlier, a similar claim was rejected in Grams.[27] See 888 F.2d at 839-40 (re-

[27] We note that several Justices of the Supreme Court, in a dissent to a dismissal of a writ of certiorari, expressed their view that a similar claim in Laboratory Corp. of America Hold-

jecting claim to process of diagnosing "abnormal condition" in person by identifying and noticing discrepancies in results of unspecified clinical tests of different parts of body).

Similarly to the situations in Meyer and Grams, Applicants here seek to claim a non-transformative process that encompasses a purely mental process of performing requisite mathematical calculations without the aid of a computer or any other device, mentally identifying those transactions that the calculations have revealed would hedge each other's risks, and performing the post-solution step of consummating those transactions. Therefore, claim 1 would effectively pre-empt any application of the fundamental concept of hedging and mathematical calculations inherent in hedging (not even limited to any particular mathematical formula). And while Applicants argue that the scope of this pre-emption is limited to hedging as applied in the area of consumable commodities, the Supreme Court's reasoning has made clear that effective pre-emption of all applications of hedging even just within the area of con-sumable commodities is impermissible. See Diehr, 450 U.S. at 191-92, 101 S.Ct. 1048 (holding that field-of-use limitations are insufficient to impart patent-eligibility to otherwise unpatentable claims drawn to fundamental principles). Moreover, while the claimed process contains physical steps (initiating, identify-

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ings v. Metabolite Laboratories, Inc. was drawn to unpatentable subject matter. 548 U.S. 124, 126 S.Ct. 2921, 2927-28, 165 L.Ed.2d 399 (2006) (Breyer, J., dissenting; joined by Stevens, J., and Souter, J.). There, the claimed process only comprised the steps of: (1) "assaying a body fluid for an elevated level of total homocysteine," and (2) "correlating an elevated level of total homocysteine in said body fluid with a deficiency of cobalamin or folate." Id. at 2924.

ing), it does not involve transforming an article into a different state or thing. Therefore, Applicants' claim is not drawn to patent-eligible subject matter under § 101.

CONCLUSION

Because the applicable test to determine whether a claim is drawn to a patent-eligible process under § 101 is the machine-or-transformation test set forth by the Supreme Court and clarified herein, and Applicants' claim here plainly fails that test, the decision of the Board is

AFFIRMED.

DYK, Circuit Judge, with whom LINN, Circuit Judge, joins, concurring.

While I fully join the majority opinion, I write separately to respond to the claim in the two dissents that the majority's opinion is not grounded in the statute, but rather "usurps the legislative role."[1] In fact, the unpatentability of processes not involving manufactures, machines, or compositions of matter has been firmly embedded in the statute since the time of the Patent Act of 1793, ch. 11, 1 Stat. 318 (1793). It is our dissenting colleagues who would legislate by expanding patentable subject matter far beyond what is allowed by the statute.

I

Section 101 now provides:

> 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 conditions and requirements of this title.

35 U.S.C. § 101 (emphases added).

The current version of § 101 can be traced back to the Patent Act of 1793. In relevant part, the 1793 Act stated that a patent may be granted to any person or persons who:

> shall allege that he or they have invented any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art, machine, manufacture or composition of matter....

[1] The dissents fault the majority for "ventur[ing] away from the statute," Rader, J., dissenting op. at 1013, and "usurp[ing] the legislative role," Newman, J., dissenting op. at 997.

1 Stat. 318, 319 § 1 (1793) (emphases added). The criteria for patentability established by the 1793 Act remained essentially unchanged until 1952, when Congress amended § 101 by replacing the word "art" with "process" and providing in § 100(b) a definition of the term "process." The Supreme Court has made clear that this change did not alter the substantive understanding of the statute; it did not broaden the scope of patentable subject matter.[2] Thus, our interpretation of § 101 must begin with a consideration of what the drafters of the early patent statutes understood the patentability standard to require in 1793. See Diehr, 450 U.S. at 182-83, 101 S.Ct. 1048 (looking to the 1793 Act).

A

The patentability criteria of the 1793 Act were to a significant extent the same in the 1790 Act.[3] The 1790 "statute was largely based on and incorporated" features of the English system and reveals a sophisticated knowledge of the English patent law and prac-

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[2] See Diamond v. Diehr, 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) ("[A] process has historically enjoyed patent protection because it was considered a form of 'art' as that term was used in the 1793 Act."); Diamond v. Chakrabarty, 447 U.S. 303, 309, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980). Rather, the 1952 Act simply affirmed the prior judicial understanding, as set forth in Corning v. Burden, 56 U.S. (15 How.) 252, 14 L.Ed. 683 (1853), that Congress in 1793 had provided for the patentability of a "process" under the term "art." Diehr, 450 U.S. at 182, 101 S.Ct. 1048.

[3] In relevant part, the 1790 Act permitted patents upon "any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used." Ch. 11, § 1, 1 Stat. 109, 110 (1790).

tice.[4] This is reflected in Senate committee re-port[5] for the bill that became the 1790 Act, which expressly noted the drafters' reliance on the English practice:

> The Bill depending before the House of Representatives for the Promotion of useful Arts is framed according to the Course of Practice in the English Patent Office except in two Instances-

22 J. Pat. Off. Soc'y at 363 (emphasis added).[6] Likewise, the legislative history of the 1793 Patent Act reflects the same keen understanding of English patent practice. During a debate in the House over the

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[4] Edward C. Walterscheid, To Promote the Progress of Useful Arts: American Patent Law & Administration, 1798-1836 109 (1998) (hereinafter To Promote the Progress); see also Edward C. Walterscheid, The Early Evolution of the United States Patent Law: Antecedents (Part 1), 76 J. Pat. & Trademark Off. Soc'y 697, 698 (1994) ("[T]he English common law relating to patents was what was best known in the infant United States.").

[5] Senate Committee Report Accompanying Proposed Amendments to H.R. 41, reprinted in Proceedings in Congress During the Years 1789 & 1790 Relating to the First Patent & Copyright Laws, 22 J. Pat. Off. Soc'y 352, 363 (1940).

[6] Neither of those two instances related to patentable subject matter or was adopted in the enacted statute. The first proposed departure from the English practice was a novelty provision protecting the inventor against those who derived their knowledge of the invention from the true inventor; the second was in a requirement that patentees make a "Public Advertisement" of their invention. Such a requirement was thought necessary "in so extensive a Country as the United States." Senate Report, reprinted in 22 J. Pat. Off. Soc'y at 363-64.

The American statute ultimately differed in some other respects. For example, Congress rejected the English rule that the invention need only be novel in England. The American statute required novelty against the whole world and did not permit "patents of importation." See To Promote the Progress, supra n. 4 at 95-97, 137-38.

creation of a Patent Office, for example, the Representative who introduced the bill noted that its principles were "an imitation of the Patent System of Great Britain." 3 Annals of Congress 855 (1793).[7]

Later, Justice Story, writing for the Supreme Court, recognized the profound influence of the English practice on these early patent laws, which in many respects codified the common law:

> It is obvious to the careful inquirer, that many of the provisions of our patent act are derived from the principles and practice which have prevailed in the construction of that of England .... The language of [the patent clause of the Statute of Monopolies] is not, as we shall presently see, identical with ours; but the construction of it adopted by the English courts, and the principles and practice which have long regulated the grants of their patents, as they must have been known and are tacitly referred to in some of the pro-visions of our own statute, afford materials to illustrate it.

Pennock v. Dialogue, 27 U.S. 1, 18, 2 Pet. 1, 7 L.Ed. 327 (1829) (emphases added); see also Graham v. John Deere Co., 383 U.S. 1, 5, 86 S.Ct. 684, 15

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[7] Even the opposing view-urging departure from the English practice in particular respects-recognized that the English practice provided considerable guidance. See 3 Annals of Congress at 855-56 ("[Great Britain] had afforded, it was true, much experience on the subject; but regulations adopted there would not exactly comport in all respects either with the situation of this country, or with the rights of the citizen here. The minds of some members had taken a wrong direction, he conceived, from the view in which they had taken up the subject under its analogy with the doctrine of patents in England."); see also To Promote the Progress, supra n. 4 at 216-17.

L.Ed.2d 545 (1966) (noting that first patent statute was written against the "backdrop" of English monopoly practices); Sears, Roebuck & Co. v. Stiffel Co., 376 U.S. 225, 230 n. 6, 84 S.Ct. 784, 11 L.Ed.2d 661 (1964) ("Much American patent law derives from English patent law.").

While Congress departed from the English practice in certain limited respects, in many respects Congress simply adopted the English practice without change. Both the 1790 and the 1793 Acts, for example, adopted the same 14-year patent term as in England. Both also required inventors to file a written specification-a requirement recognized by the English common law courts in the mid-eighteenth century.[8] In addition, as discussed below, the categories of patentable subject matter closely tracked the English approach, and in certain respects reflected a deliberate choice between competing views prevalent in England at the time.

B

The English practice in 1793, imported into the American statutes, explicitly recognized a limit on patentable subject matter. As the Supreme Court recounted in Graham v. John Deere, the English concern about limiting the allowable scope of patents arose from an aversion to the odious Crown practice of granting patents on particular types of businesses to court favorites. 383 U.S. 1, 5, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966); see also MacLeod, supra n. 8 at 15 ("But most offensive of all was the granting of monopoly powers in established industries, as a form of

[8] See Christine MacLeod, Inventing the Industrial Revolution: The English Patent System, 1660-1800 48-49 (2002); To Promote the Progress, supra n. 4 at 400, 404.

patronage, to courtiers whom the crown could not otherwise afford to reward."). Parliament responded to the Crown's abuses in 1623 by passing the Statute of Monopolies, prohibiting the Crown from granting these despised industry-type monopolies. Not all monopolies were prohibited, however: the Statute expressly exempted invention-type patent monopolies. Section 6 of the Statute exempted from its prohibitions "letters patent and grants of privilege for the term of fourteen years or under, hereafter to be made, of the sole working or making of any manner of new manufactures within this realm, to the true and first inventor and inventors of such manufactures...." 21 Jac. 1. c.3, s.6 (emphases added).

Each of the five categories of patentable subject matter recognized by the 1793 Patent Act—(1) "manufacture," (2) "machine," (3) "composition of matter," (4) "any new and useful improvement," and (5) "art"—was drawn either from the Statute of Monopolies and the common law refinement of its interpretation or resolved competing views being debated in England at the time. See To Promote the Progress, supra n. 4 at 239.

"Manufacture." At the most basic level, the 1793 Act, like the Statute of Monopolies, expressly provided for the patentability of "manufactures." This language was not accidental, but rather reflected a conscious adoption of that term as it was used in the English practice. Id. ("It is clear that the Congress sought to incorporate into the U.S. statutory scheme in 1793 at least as much of the common law interpretation of 'new manufactures' as was understood at the time.").

"Machine." Likewise, the category of "machines" in the 1793 Act had long been understood to be within

the term "manufactures" as used in the English statute. See id.; see, e.g., Morris v. Bramson, 1 Carp. P.C. 30, 31 (K.B.1776) (sustaining a patent "for an engine or machine on which is fixed a set of working needles ... for the making of eyelet-holes") (emphasis added); MacLeod, supra n. 8 at 101 (noting, among numerous other early machine patents, seven patents on "machinery to raise coal and ores" before 1750).

"Composition of Matter." Although the 1790 statute did not explicitly include "compositions of matter," this was remedied in the 1793 statute. At the time, "compositions of matter" were already understood to be a type of manufacture patentable under the English statute. See To Promote the Progress, supra n. 4, at 224 n. 4. One example is found in Liardet v. Johnson, 1 Carp. P.C. 35 (K.B.1778), a case involving a patent on a "composition" of stucco (a composition of matter). Lord Mansfield's jury instructions noted that by the time of that trial he had decided "several cases" involving compositions: "But if ... the specification of the composition gives no proportions, there is an end of his patent.... I have determined, [in] several cases here, the specification must state, where there is a composition, the proportions...."[9]

"Any new and useful improvement." The reference to "any new and useful improvement" in the 1793 Act also adopted a consensus recently reached by the English courts. The common law courts had first ruled in Bircot's Case in the early seventeenth century that an improvement to an existing machine

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[9] Edward C. Walterscheid, The Nature of the Intellectual Property Clause: A Study in Historical Perspective 55 (2002) (quoting E. Wyndham Hulme, On the History of the Patent Laws in the Seventeenth and Eighteenth Centuries, 18 L.Q. Rev. 280, 285 (1902)).

could not be the proper subject of a patent under the Statute of Monopolies. See Boulton v. Bull, 2 H. Bl. 463, 488 (C.P.1795). In 1776 that line of cases was overruled in Morris v. Bramson, because such a reading of the statute "would go to repeal almost every patent that was ever granted."[10]

"Art." As the Supreme Court has recognized, a process "was considered a form of 'art' as that term was used in the 1793 Act." Diehr, 450 U.S. at 182, 101 S.Ct. 1048 (citing Corning v. Burden, 56 U.S. at 267-268). The language of the Statute of Monopolies permitted patents on that which could be characterized as the "working or making of any manner of new manufactures within this realm." 21 Jac. 1. c.3, s.6. While this language plainly applied to tangible "new manufactures" (such as machines or compositions of matter), it also appeared to allow patenting of manufacturing processes as the "working or making of any manner of new manufactures." Thus, under the Statute of Monopolies patents could be had on the "working or making of any manner of new manufactures." Numerous method patents had issued by 1793, including James Watt's famous 1769 patent on a "[m]ethod of diminishing the consumption of fuel in [steam]-engines."[11] However, the English courts in the mid-eighteenth century had not yet resolved whether processes for manufacturing were themselves patentable under the statute, and as discussed

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[10] Morris, 1 Carp. P.C. at 34; see also Boulton, 2 H.Bl. at 489 ("Since [Morris v. Bramson], it has been the generally received opinion in Westminster Hall, that a patent for an addition is good.").

[11] Walterscheid, supra n. 9 at 355-56 (emphasis added); see also Boulton, 2 H. Bl. at 494-95 (1795) (noting that many method patents had issued).

below, the issue was being actively litigated in the English courts. In the 1793 Act Congress resolved this question by including the term "art" in the statute, adopting the practice of the English law officers and the views of those in England who favored process patents.

II

The question remains as to what processes were considered to be patentable in England at the time of the 1793 Act. Examination of the relevant sources leads to the conclusion that the method Bilski seeks to claim would not have been considered patentable subject matter as a process under the English statute.

A

First, the language of the Statute of Monopolies-"working or making of any manner of new manufactures"—suggests that only processes that related to "manufactures" (including machines or compositions of matter) could be patented.

Second, the English patent practice before and contemporaneous with the 1793 Act confirms the notion that patentable subject matter was limited by the term "manufacture" in the Statute of Monopolies and required a relation to the other categories of patentable subject matter. The organization of human activity was not within its bounds. Rather, the patents registered in England under the Statute of Monopolies before 1793 were limited to articles of manufacture, machines for manufacturing, compositions of matter, and related processes. A complete list of such patents (with a few missing patents from the 17th century) was published in the mid-1800s by Bennet Woodcroft, the first head of the English Patent Of-

fice.[12] Representative examples of patented processes at the time include: "Method of making a more easy and perfect division in stocking frame-work manufactures," No. 1417 to John Webb (1784); "Making and preparing potashes and pearl-ashes of materials not before used for the purpose," No. 1223 to Richard Shannon (1779); "Making salt from sea-water or brine, by steam," No. 1006 to Daniel Scott (1772); "Milling raw hides and skins so as to be equally good for leather as if tanned," No. 893 to George Merchant (1768); "Making salt, and removing the corrosive nature of the same, by a separate preparation of the brine," No. 416 to George Campbell (1717); and "Making good and merchantable tough iron ... with one-fifth of the expense of charcoal as now used," No. 113 to Sir Phillibert Vernatt (1637).

Nothing in Woodcroft's list suggests that any of these hundreds of patents was on a method for organizing human activity, save for one aberrational patent discussed below. Rather, the established practice reflects the understanding that only processes related to manufacturing or "manufactures" were within the statute. The English cases before 1793 recognized that the practice followed in issuing patents was directly relevant to the construction of the statute. See, e.g., Morris, 1 Carp. P.C. at 34 (declining to read the statute in such a way that "would go to repeal almost every patent that was ever granted").

Third, nearly contemporaneous English cases following shortly after the 1793 Act lend further insight into what processes were thought to be patentable under the English practice at the time the statute

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[12] Bennet Woodcroft, Alphabetical Index of Patentees of Inventions, from March 2, 1617 (14 James I) to October 1, 1852 (16 Victoriae) (2d ed. 1857).

was enacted. Although the issue of the validity of process patents had not conclusively been settled in the English common law before 1793, the question was brought before the courts in the landmark case of Boulton v. Bull, 2 H. Bl. 463, 465 (C.P.1795), which involved James Watt's patent for a "method of lessening the consumption of steam, and consequently fuel in [steam] engines."[13] In 1795, the court rendered a split decision, with two judges on each side. Boulton, 2 H. Bl. at 463 (1795). Those who viewed process patents as invalid, as did Justice Buller, urged that a method was merely an unpatentable principle: "A patent must be for some new production from [elements of nature], and not for the elements themselves." Id. at 485. He thought "it impossible to support a patent for a method only, without having carried it into effect and produced some new sub-stance." Id. at 486. Justice Health similarly found that the "new invented method for lessening the consumption of steam and fuel in [steam] engines" (i.e., the Watt patent), being neither "machinery" nor a "substance [ ] (such as medicine[]) formed by chemical and other processes," was not within the Statute of Monopolies. Id. at 481-82. In contrast, Lord Chief Justice Eyres, who believed processes had long been a valid subject of patents, urged that "two-thirds, I believe I might say three-fourths, of all patents granted since the statute [of Monopolies] passed, are for methods of operating and of manufacturing...." Id. at 494-95 (emphasis added). He agreed that "[u]ndoubtedly there

[13] The Supreme Court has in several opinions noted Boulton v. Bull in connection with its consideration of English patent practice. See, e.g., Markman v. Westview Instruments, Inc., 517 U.S. 370, 381 n. 6, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996); Evans v. Eaton, 20 U.S. (7 Wheat.) 356, 388 n. 2-3, 5 L.Ed. 472 (1822).

can be no patent for a mere principle; but for a principle so far embodied and connected with corporeal substances... I think there may be a patent." Id. at 495 (emphasis added). Justice Rooke also noted that Watt's method was within the statute because it was connected with machinery: "What method can there be of saving steam or fuel in engines, but by some variation in the construction of them?" Id. at 478. The Justices who believed process patents were valid spoke in terms of manufacturing, machines, and compositions of matter, because the processes they believed fell within the statute were processes that "embodied and connected with corporeal substances." Id. at 495.

In 1799, on appeal from another case involving the same Watt patent, the validity of such process patents were upheld. Hornblower v. Boulton (K.B.1799), 8 T.R. 95. There, Chief Justice Lord Kenyon stated that "it evidently appears that the patentee claims a monopoly for an engine or machine, composed of material parts, which are to produce the effect described; and that the mode of producing this is so described, as to enable mechanics to produce it.... I have no doubt in saying, that this is a patent for a manufacture, which I understand to be something made by the hands of man." Id. at 99. Justice Grose agreed, finding that "Mr. Watt had invented a method of lessening the consumption of steam and fuel in [steam] engines", and this was "not a patent for a mere principle, but for the working and making of a new manufacture within the words and meaning of the statute." Id. at 101-02. He further noted, however, that "This method ... if not effected or accompanied by a manufacture, I should hardly consider as within the [statute]." Id. at 102-03 (emphasis added). Justice Lawrence similarly found such process pat-

ents to be permissible: "Engine and method mean the same thing, and may be the subject of a patent. 'Method,' properly speaking, is only placing several things and performing several operations in the most convenient order...." Id. at 106.

There is no suggestion in any of this early consideration of process patents that processes for organizing human activity were or ever had been patentable. Rather, the uniform assumption was that the only processes that were patentable were processes for using or creating manufactures, machines, and compositions of matter.

B

The dissenters here, by implication at least, appear to assume that this consistent English practice should somehow be ignored in interpreting the current statute because of technological change.[14] There are several responses to this.

The first of these is that the Supreme Court has made clear that when Congress intends to codify existing law, as was the case with the 1793 statute, the law must be interpreted in light of the practice at the time of codification. In Schmuck v. United States, 489 U.S. 705, 718-19, 109 S.Ct. 1443, 103 L.Ed.2d 734 (1989), for example, the Court considered the proper interpretation of Rule 31(c) of the Federal Rules of

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[14] See, e.g., Rader, J., dissenting op. at 1011 ("[T]his court ties our patent system to dicta from an industrial age decades removed from the bleeding edge."); id. ("[T]his court ... links patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes...."); Newman, J., dissenting op. at 1011 ("[T]his court now adopts a redefinition of 'process' in Section 101 that excludes forms of information-based and software-implemented inventions arising from new technological capabilities....").

Criminal Procedure. The rule, "which ha [d] not been amended since its adoption in 1944," was a restatement of an 1872 Act "codif[ying] the common law for federal criminal trials." Because of this fact, the Court found that the "prevailing practice at the time of the Rule's promulgation informs our under-standing of its terms." Id.; see also, e.g., Eldred v. Ashcroft, 537 U.S. 186, 200 n. 5, 123 S.Ct. 769, 154 L.Ed.2d 683 (2003) (considering the English practice at the time of the enactment of the 1790 copyright act); Tome v. United States, 513 U.S. 150, 159-60, 166, 115 S.Ct. 696, 130 L.Ed.2d 574 (1995) (looking to practice and noting that "a majority of common-law courts were performing [a task required by the common law] for well over a century" in interpreting a Federal Rule of Evidence that "was intended to carry over the common-law"); Harper & Row Publishers, Inc. v. Nation Enters., 471 U.S. 539, 549-554, 105 S.Ct. 2218, 85 L.Ed.2d 588 (1985) (relying on the history and practice of copyright fair-use when statutory provision reflected the "intent of Congress to codify the common-law doctrine"); Sprague v. Ticonic Nat'l Bank, 307 U.S. 161, 164-65, 59 S.Ct. 777, 83 L.Ed. 1184 (1939) (considering the English practice "which theretofore had been evolved in the English Court of Chancery" at the time of the 1789 Judiciary Act in determining availability of costs under equity jurisdiction).

Second, the Supreme Court language upon which the dissents rely[15] offers no warrant for rewriting the

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[15] See, e.g., Newman, J., dissenting op. at 981 ("'[C]ourts should not read into the patent laws limitations and conditions which the legislature has not expressed.'" (quoting Diehr, 450 U.S. at 182, 101 S.Ct. 1048)); Rader, J., dissenting op. at 1012 (same).

1793 Act. To be sure, Congress intended the courts to have some latitude in interpreting § 101 to cover emerging technologies, Chakrabarty, 447 U.S. at 316, 100 S.Ct. 2204, and the categorical terms chosen are sufficiently broad to encompass a wide range of new technologies. But there is no evidence that Congress intended to confer upon the courts latitude to extend the categories of patentable subject matter in a significant way. To the contrary, the Supreme Court made clear that "Congress has performed its constitutional role in defining patentable subject matter in § 101; we perform ours in construing the language Congress has employed. In so doing, our obligation is to take statutes as we find them, guided, if ambiguity appears, by the legislative history and statutory purpose." Id. at 315, 100 S.Ct. 2204. In Benson, the Court rejected the argument that its decision would "freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology." Gottschalk v. Benson, 409 U.S. 63, 71, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972). Instead, the Court explained that it "may be that the patent laws should be extended to cover [such onrushing technology], a policy matter to which we are not competent to speak" but that "considered action by the Congress is needed." Id. at 72-73, 93 S.Ct. 253.

Third, we are not dealing here with a type of subject matter unknown in 1793. One commentator has noted:

> The absence of business method patents cannot be explained by an absence of entrepreneurial creativity in Great Britain during the century before the American Revolution. On the contrary, 1720 is widely hailed as the beginning of a new

> era in English public finance and the beginning of major innovations in business organization.

Malla Pollack, The Multiple Unconstitutionality of Business Method Patents, 28 Rutgers Computer & Tech. L.J. 61, 96 (2002) (footnotes omitted).[16] In the hundreds of patents in Woodcroft's exhaustive list of English patents granted from 1612 to 1793, there appears to be only a single patent akin to the type of method Bilski seeks to claim. That sole exception was a patent granted to John Knox in 1778 on a "Plan for assurances on lives of persons from 10 to 80 years of age."[17] Later commentators have viewed this single patent as clearly contrary to the Statute of Monopolies:

> Such protection of an idea should be impossible .... It is difficult to understand how Knox's plan for insuring lives could be regarded as 'a new manner of manufacture'; perhaps the Law Officer was in a very good humour that day, or perhaps he had forgotten the wording of the statute; most likely he was concerned only with the promised 'very considerable Consumption of [Revenue] Stamps' which, Knox declared, would 'contribute to the increase of the Public Revenues.'

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[16] Similarly, another commentator states: "it might be wondered why none of the many ingenious schemes of insurance has ever been protected by patenting it." D.F. Renn, John Knox's Plan for Insuring Lives: A Patent of Invention in 1778, 101 J. Inst. Actuaries 285 (1974), available at http://www.actuaries.org.uk/_data/assets/pdf_file/0006/25278/0285-0289.pdf (last visited Oct. 3, 2008).

[17] Woodcroft, supra n.12 at 324.

Renn, supra n. 16 at 285. There is no indication that Knox's patent was ever enforced or its validity tested, or that this example led to other patents or efforts to patent similar activities. But the existence of the Knox patent suggests that as of 1793 the potential advantage of patenting such activities was well-understood.

In short, the need to accommodate technological change in no way suggests that the judiciary is charged with rewriting the statute to include methods for organizing human activity that do not involve manufactures, machines, or compositions of matter.

C

Since the 1793 statute was reenacted in 1952, it is finally important also to inquire whether between 1793 and 1952 the U.S. Patent Office and the courts in this country had departed from the English practice and allowed patents such as those sought by Bilski. In fact, the U.S. Patent Office operating under the 1793 Act hewed closely to the original understanding of the statute. As in the English practice of the time, there is no evidence that patents were granted under the 1793 Act on methods of organizing human activity not involving manufactures, machines or the creation of compositions of matter. The amicus briefs have addressed the early American practice, and some of them claim that human activity patents were allowed in the early period. To the contrary, the patents cited in the briefs are plainly distinguishable.

The earliest claimed human activity patent cited in the briefs issued in 1840, entitled "Improvement in the Mathematical Operation of Drawing Lottery-Schemes." Br. of Amicus Curiae Regulatory Datacorp

23 n.54. But that patent is fundamentally unlike the Bilski claim, since it does not claim a method of organizing human activity not involving manufactures, machines or the creation of compositions of matter. See U.S. Patent No. 1700 (issued July 18, 1840). Rather, it is directed to a scheme of combining different combinations of numbers onto a large number of physical lottery tickets (i.e., a method for manufacturing lottery tickets). Id. col.1. The other early-issued patents cited in the amicus briefs are similarly distinguishable.[18]

Likewise, Supreme Court decisions before the 1952 Patent Act assumed that the only processes that were patentable were those involving other types of patentable subject matter. In later cases the Supreme Court has recognized that these cases set forth the

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[18] See, e.g., Complemental Accident Insurance Policy, U.S. Patent No. 389,818 (issued Sept. 18, 1888) (claiming a "complemental insurance policy" as an apparatus consisting of two separate cards secured together); Insurance System, U.S. Patent No. 853,852 (issued May 14, 1907) (claiming a "two-part insurance policy" as "an article of manufacture").

A number of the amici also refer to the discussion and the patents cited in "A USPTO White Paper" (the "White Paper") to establish the historical foundation of business method patents. See, e.g., Br. of Amicus Curiae Accenture 14-15 n. 11. As Judge Mayer notes, dissenting op. at 1001-02 n. 4, the White Paper does not show this proposition. As the White Paper itself recognizes, the early financial patents it discusses were largely mechanical products and methods related to financial paper, not methods for organizing human activity. White Paper at 2. Thus, while the White Paper shows that inventions in the business realm of finance and management historically enjoyed patent protection, it does little to establish that business methods directed to the organization of human activity not involving manufactures, machines or the creation of compositions of matter were similarly patentable.

standard for process patents in the pre-1952 period. Diehr, 450 U.S. at 182-84, 101 S.Ct. 1048; Gottschalk, 409 U.S. at 69-70, 93 S.Ct. 253. The leading case is Corning v. Burden, 56 U.S. 252, 15 How. 252, 14 L.Ed. 683 (1853). There, the Supreme Court discussed the patentability of processes:

> A process, eo nomine, is not made the subject of a patent in our act of Congress. It is included under the general term 'useful art.' An art may require one or more processes or machines in order to produce a certain result or manufacture. The term machine includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result. But where the result or effect is produced by chemical action, by the operation or application of some element or power of nature, or of one substance to another, such modes, methods, or operations, are called 'processes.' A new process is usually the result of discovery; a machine, of invention. The arts of tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores, and numerous others are usually carried on by processes, as distinguished from machines.... It is for the discovery or invention of some practicable method or means of producing a beneficial result or effect that a patent is granted, and not for the result or effect itself. It is when the term process is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means which are not effected by mechanism or mechanical combinations.

Id. at 267-68 (emphases added). In Cochrane v. Deener, the Court clarified its understanding of a patentable "process":

> That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be disputed....A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process 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.

94 U.S. 780, 787-88, 24 L.Ed. 139 (1876) (emphases added). Finally, in Tilghman v. Proctor, 102 U.S. 707, 722, 26 L.Ed. 279 (1880), the Court noted:

> That a patent can be granted for a process there can be no doubt. The patent law is not confined to new machines and new compositions of matter, but extends to any new and useful art or manufacture. A manufacturing process is clearly an art, within the meaning of the law.

(Emphasis added). The Court's definition of a patentable process was well-accepted and consistently applied by the courts of appeals. See, e.g., P.E. Sharpless Co. v. Crawford Farms, 287 F. 655, 658-59 (2nd Cir.1923); Chicago Sugar-Refining Co. v. Charles Pope Glucose Co., 84 F. 977, 982 (7th Cir.1898).

Finally, nothing in the legislative history of the 1952 Act suggests that Congress intended to enlarge

the category of patentable subject matter to include patents such as the method Bilski attempts to claim. As discussed above, the only change made by the 1952 Act was in replacing the word "art" with the word "process." The Supreme Court has already concluded that this change did not alter the sub-stantive understanding of the statute. See Diehr, 450 U.S. at 182, 101 S.Ct. 1048 ("[A] process has historically enjoyed patent protection because it was considered a form of 'art' as that term was used in the 1793 Act.").

The House Report accompanying the 1952 bill includes the now-famous reference to "anything under the sun made by man":

> A person may have "invented" a machine or a manufacture, which may include anything under the sun made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.

H.R.1923 at 7. Although this passage has been used by our court in past cases to justify a broad inter-pretation of patentable subject matter, I agree with Judge Mayer that, when read in context, the statement undercuts the notion that Congress intended to expand the scope of § 101. See Mayer, J., dissenting op. at 1000. It refers to things "made by man," not to methods of organizing human activity. In this respect, the language is reminiscent of the 1799 use of the phrase "something made by the hands of man" by Chief Justice Lord Kenyon as a limitation on patentable subject matter under the Statute of Monopolies. The idea that an invention must be "made by man" was used to distinguish "a philosophical principle only, neither organized or capable of being organized" from a patentable manufacture. Hornblower, 8 T.R. at 98. Lord Kenyon held that the

patent before him was not based on a mere principle, but was rather "a patent for a manufacture, which I understand to be something made by the hands of man." Id. at 98 (emphases added); accord American Fruit Growers v. Brogdex Co., 283 U.S. 1, 11, 51 S.Ct. 328, 75 L.Ed. 801 (1931) (giving "anything made for use from raw or prepared materials" as one definition of "manufacture").

In short, the history of § 101 fully supports the majority's holding that Bilski's claim does not recite patentable subject matter. Our decision does not reflect "legislative" work, but rather careful and respectful adherence to the Congressional purpose.

NEWMAN, Circuit Judge, dissenting.

The court today acts en banc to impose a new and far-reaching restriction on the kinds of inventions that are eligible to participate in the patent system. The court achieves this result by redefining the word "process" in the patent statute, to exclude all processes that do not transform physical matter or that are not performed by machines. The court thus excludes many of the kinds of inventions that apply today's electronic and photonic technologies, as well as other processes that handle data and information in novel ways. Such processes have long been patent eligible, and contribute to the vigor and variety of today's Information Age. This exclusion of process inventions is contrary to statute, contrary to precedent, and a negation of the constitutional mandate. Its impact on the future, as well as on the thousands of patents already granted, is unknown.

This exclusion is imposed at the threshold, before it is determined whether the excluded process is new, non-obvious, enabled, described, particularly claimed, etc.; that is, before the new process is examined for patentability. For example, we do not know whether the Bilski process would be found patentable under the statutory criteria, for they were never applied.

The innovations of the "knowledge economy"-of "digital prosperity"-have been dominant contributors to today's economic growth and societal change. Revision of the commercial structure affecting major aspects of today's industry should be approached with care, for there has been significant reliance on the law as it has existed, as many amici curiae pointed out. Indeed, the full reach of today's change of law is not clear, and the majority opinion states that many

existing situations may require reassessment under the new criteria.

Uncertainty is the enemy of innovation. These new uncertainties not only diminish the incentives available to new enterprise, but disrupt the settled expectations of those who relied on the law as it existed. I respectfully dissent.

DISCUSSION

The court's exclusion of specified process inventions from access to the patent system is achieved by re-defining the word "process" in the patent statute. However, the court's redefinition is contrary to statute and to explicit rulings of the Supreme Court and this court. I start with the statute:

Section 101 is the statement of statutory eligibility

From the first United States patent act in 1790, the subject matter of the "useful arts" has been stated broadly, lest advance restraints inhibit the unknown future. The nature of patent-eligible subject matter has received judicial attention over the years, as new issues arose with advances in science and technology. The Supreme Court has consistently confirmed the constitutional and legislative purpose of providing a broadly applicable incentive to commerce and creativity, through this system of limited exclusivity. Concurrently, the Court early explained the limits of patentable subject matter, in that "fundamental truths" were not intended to be included in a system of exclusive rights, for they are the general foundations of knowledge. Thus laws of nature, natural phenomena, and abstract ideas are not subject to patenting. Several rulings of the Court have reviewed patent eligibility in light of these fundamentals. However, the Court explicitly negated today's restric-

tions. My colleagues in the majority are mistaken in finding that decisions of the Court require the per se limits to patent eligibility that the Federal Circuit today imposes. The patent statute and the Court's decisions neither establish nor support the exclusionary criteria now adopted.

The court today holds that any process that does not transform physical matter or require performance by machine is not within the definition of "process" in any of the patent statutes since 1790. All of the statutes contained a broad definition of patent-eligible subject matter, like that in the current Patent Act of 1952:

> 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 conditions and requirements of this title.

In Diamond v. Diehr, 450 U.S. 175, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) the Court explained that Section 101 is not an independent condition of patentability, but a general statement of subject matter eligibility. The Court stated:

> Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection "subject to the conditions and requirements of this title." Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty. The question therefore of whether a particular invention is novel is "wholly apart from whether the invention falls in a category of statutory subject matter."

Id. at 189-90, 101 S.Ct. 1048 (footnote omitted) (quoting In re Bergy, 596 F.2d 952, 961 (C.C.P.A.1979)).

"Process" is defined in the 1952 statute as follows:

> 35 U.S.C. § 100(b) The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

The 1952 Patent Act replaced the word "art" in prior statutes with the word "process," while the rest of Section 101 was unchanged from earlier statutes. The legislative history for the 1952 Act explained that "art" had been "interpreted by courts to be practically synonymous with process or method." S.Rep. No. 82-1979 (1952), reprinted in 1952 U.S.C.C.A.N. 2394, 2398, 2409-10. In Diehr the Court explained that a process "has historically enjoyed patent protection because it was considered a form of 'art' as that term was used in the 1793 Act." 450 U.S. at 182, 101 S.Ct. 1048.

The definition of "process" provided at 35 U.S.C. § 100(b) is not "unhelpful," as this court now states, maj. op. at 951 n. 3, but rather points up the errors in the court's new statutory interpretation. Section 100(b) incorporates the prior usage "art" and the term "method," and places no restriction on the definition. This court's redefinition of "process" as limiting access to the patent system to those pro-cesses that use specific machinery or that transform matter, is contrary to two centuries of statutory definition.

The breadth of Section 101 and its predecessor provisions reflects the legislative intention to accommodate not only known fields of creativity, but also the unknown future. The Court has consistently refrained from imposing unwarranted restrictions on

statutory eligibility, and for computer-implemented processes the Court has explicitly rejected the direction now taken. Nonetheless, this court now adopts a redefinition of "process" in Section 101 that excludes forms of information-based and software-implemented inventions arising from new technological capabilities, stating that this result is required by the Court's computer-related cases, starting with Gottschalk v. Benson, 409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972). However, the Court in Benson rejected the restriction that is imposed today:

This court's new definition of "process" was rejected in Gottschalk v. Benson

In Benson the claimed invention was a mathematical process for converting binary-coded decimal numerals into pure binary numbers. The Court explained that a mathematical formula unlimited to a specific use was simply an abstract idea of the nature of "fundamental truths," "phenomena of nature," and "abstract intellectual concepts," as have traditionally been outside of patent systems. 409 U.S. at 67, 93 S.Ct. 253. However, the Court explicitly declined to limit patent-eligible processes in the manner now adopted by this court, stating:

> 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. It is said that the decision precludes a patent for any program servicing a computer. We do not so hold.

Id. at 71, 93 S.Ct. 253. The Court explained that "the requirements of our prior precedents" did not pre-

clude patents on computer programs, despite the statement drawn from Cochrane v. Deener, 94 U.S. 780, 787-88, 24 L.Ed. 139 (1876), that "[t]rans-formation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." Benson, 409 U.S. at 70, 93 S.Ct. 253. Although this same statement is now relied upon by this court as requiring its present ruling, maj. op at 956 & n. 11, the Court in Benson was explicit that: "We do not hold that no process patent could ever qualify if it did not meet [the Court's] prior pre-cedents." The Court recognized that Cochrane's statement was made in the context of a mechanical process and a past era, and protested:

> It is said we freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology. Such is not our purpose.

Benson, 409 U.S. at 71, 93 S.Ct. 253. Instead, the Court made clear that it was not barring patents on computer programs, and rejected the "argu[ment] 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'" in order to satisfy Section 101. Id. Although my colleagues now describe these statements as "equivocal," maj. op. at 956, there is nothing equivocal about "We do not so hold." Benson, 409 U.S. at 71, 93 S.Ct. 253. Nonetheless, this court now so holds.

In Parker v. Flook the Court again rejected today's restrictions

The eligibility of mathematical processes next reached the Court in Parker v. Flook, 437 U.S. 584,

98 S.Ct. 2522, 57 L.Ed.2d 451 (1978), where the Court held that the "process" category of Section 101 was not met by a claim to a mathematical formula for calculation of alarm limits for use in connection with catalytic conversion of hydrocarbons and, as in Benson, the claim was essentially for the mathematical formula. The Court later summarized its Flook holding, stating in Diamond v. Diehr that:

> The [Flook] application, however, did not purport to explain how these other variables were to be determined, nor did it purport "to contain any disclosure relating to the chemical processes at work, the monitoring of the process variables, nor 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."

Diehr, 450 U.S. at 186-87, 101 S.Ct. 1048 (quoting Flook, 437 U.S. at 586, 98 S.Ct. 2522).

The Court explained in Flook that a field-of-use restriction to catalytic conversion did not distinguish Flook's mathematical process from that in Benson. However, the Court reiterated that patent eligibility of computer-directed processes is not controlled by the "qualifications of our earlier precedents," again negating any limiting effect of the usages of the past, on which this court now places heavy reliance. The Court stated:

> The statutory definition of "process" is broad. An argument can be made, however, 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." 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.[1]

Flook, 437 U.S. at 589 n. 9, 98 S.Ct. 2522 (quoting Cochrane, 94 U.S. at 787). This statement directly contravenes this court's new requirement that all processes must meet the court's "machine-or-transformation test" or be barred from access to the patent system.

The Court in Flook discussed that abstractions and fundamental principles have never been subject to patenting, but recognized the "unclear line" between an abstract principle and the application of such principle:

> The line between a patentable "process" and an unpatentable "principle" is not always clear. Both are "conception[s] of the mind, seen only by [their] effects when being executed or performed."

Flook, 437 U.S. at 589, 98 S.Ct. 2522 (alterations in original) (quoting Tilghman v. Proctor, 102 U.S. 707, 728, 26 L.Ed. 279 (1880)).

The decision in Flook has been recognized as a step in the evolution of the Court's thinking about computers. See Arrhythmia Res. Tech., Inc. v. Corazonix Corp., 958 F.2d 1053, 1057 n. 4 (Fed.Cir.1992) ("it appears to be generally agreed that these decisions represent evolving views of the Court") (citing R.L. Gable & J.B. Leaheey, The Strength of Patent Pro-tection

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[1] My colleagues cite only part of this quotation as the Court's holding in Flook, maj. op. at 955, ignoring the qualifying words "[a]n argument can be made" as well as the next sentence clarifying that this argument was rejected by the Court in Benson and is now again rejected in Flook.

for Computer Products, 17 Rutgers Computer & Tech. L.J. 87 (1991); D. Chisum, The Patentability of Algorithms, 47 U. Pitt. L.Rev. 959 (1986)). That Flook does not support today's per se exclusion of forms of process inventions from access to the patent system is reinforced in the next Section 101 case decided by the Court:

In Diamond v. Chakrabarty the Court again rejected per se exclusions of subject matter from Section 101

In Diamond v. Chakrabarty, 447 U.S. 303, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980), the scope of Section 101 was challenged as applied to the new fields of biotechnology and genetic engineering, with respect to the patent eligibility of a new bacterial "life form." The Court explained the reason for the broad terms of Section 101:

> The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting "the Progress of Science and the useful Arts" with all that means for the social and economic benefits envisioned by Jefferson. Broad general language is not necessarily ambiguous when congressional objectives require broad terms.

Id. at 315, 100 S.Ct. 2204 (quoting U.S. Const., art. I, § 8). The Court referred to the use of "any" in Section 101 ("Whoever invents or discovers any new and useful process ... or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title"), and reiterated that the statutory language shows that Congress "plainly contemplated that the patent laws would be given wide scope." Id. at 308, 100 S.Ct.

2204. The Court referred to the legislative intent to include within the scope of Section 101"anything under the sun that is made by man," id. at 309, 100 S.Ct. 2204 (citing S. Rep. 82-1979, at 5, U.S.Code Cong. & Admin.News 1952, pp. 2394, 2399; H.R. Rep. 82-1923, at 6 (1952)), and stated that the unforeseeable future should not be inhibited by judicial restriction of the "broad general language" of Section 101:

> A rule that unanticipated inventions are without protection would conflict with the core concept of the patent law that anticipation undermines patentability. Mr. Justice Douglas reminded that the inventions most benefiting mankind are those that push back the frontiers of chemistry, physics, and the like. Congress employed broad general language in drafting § 101 precisely because such inventions are often unforeseeable.

Id. at 315-16, 100 S.Ct. 2204 (citations and internal quotation marks omitted). The Court emphasized that its precedents did not alter this understanding of Section 101's breadth, stating that " Flook did not announce a new principle that inventions in areas not contemplated by Congress when the patent laws were enacted are unpatentable per se." Id. at 315, 100 S.Ct. 2204.

Whether the applications of physics and chemistry that are manifested in advances in computer hardware and software were more or less foreseeable than the advances in biology and biotechnology is debatable, but it is not debatable that these fields of endeavor have become primary contributors to today's economy and culture, as well as offering an untold potential for future advances. My colleagues offer no reason now to adopt a policy of exclusion of the un-

known future from the subject matter now embraced in Section 101.

Soon after Chakrabarty was decided, the Court returned to patentability issues arising from computer capabilities:

In Diamond v. Diehr the Court directly held that computer-implemented processes are included in Section 101

The invention presented to the Court in Diehr was a "physical and chemical process for molding precision synthetic rubber products" where the process steps included using a mathematical formula. The Court held that the invention fit the "process" category of Section 101 although mathematical calculations were involved, and repeated its observation in Chakrabarty that "courts should not read into the patent laws limitations and conditions which the legislature has not expressed." Diehr, 450 U.S. at 182, 101 S.Ct. 1048 (internal quotation marks omitted) (citing Chakrabarty, 447 U.S. at 308, 100 S.Ct. 2204).

The Court distinguished a claim that would cover all uses of a mathematical formula and thus is an abstract construct, as in Benson, from a claim that applies a mathematical calculation for a specified purpose, as in Diehr. The Court stated that "a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer," id. at 187, 101 S.Ct. 1048, and explained that the line between statutory and nonstatutory processes depends on whether the process is directed to a specific purpose, see id. ("It is now commonplace that an application of a law of nature or mathemati-

cal formula to a known structure or process may well be deserving of patent protection."(emphasis in original)). The Court clarified that Flook did not hold that claims may be dissected into old and new parts to assess their patent eligibility. Id. at 189 n. 12, 101 S.Ct. 1048.

However, the Court did not propose the "machine-or-transformation" test that this court now insists was "enunciated" in Diehr as a specific limit to Section 101. Maj. op. at 953-54. In Diehr there was no issue of machine or transformation, for the Diehr process both employed a machine and produced a chemical transformation: the process was conducted in "an openable rubber molding press," and it cured the rubber. In discussing the known mathematical formula used by Diehr to calculate the relation between temperature and the rate of a chemical reaction, the Court recited the traditional exceptions of "laws of nature, natural phenomena, and abstract ideas," 450 U.S. at 185, 101 S.Ct. 1048, and explained that the entirety of the process must be considered, not an individual mathematical step.

The Court characterized the holdings in Benson and Flook as standing for no more than the continued relevance of these "long-established" judicial exclusions, id., and repeated that a practical application of pure science or mathematics may be patentable, citing Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86, 94, 59 S.Ct. 427, 83 L.Ed. 506 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge and scientific truth may be."). The Court explained that the presence of a mathematical formula does not preclude patentability when the structure or

process is performing a function within the scope of the patent system, stating:

> [W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101.

450 U.S. at 192, 101 S.Ct. 1048. This statement's parenthetical "e.g." is relied on by the majority for its statement that Diehr requires today's "machine-or-transformation" test. However, this "e.g." does not purport to state the only "function which the patent laws were designed to protect." Id. This "e.g." indeed describes the process in Diehr, but it does not exclude all other processes from access to patenting.

It cannot be inferred that the Court intended, by this "e.g." parenthetical, to require the far-reaching exclusions now attributed to it. To the contrary, the Court in Diehr was explicit that "an application of a law of nature or mathematical formula" may merit patent protection, 450 U.S. at 187, 101 S.Ct. 1048 (emphasis in original), and that the claimed process must be considered as a whole, id. at 188, 101 S.Ct. 1048. The Court recognized that a process claim may combine steps that were separately known, and that abstract ideas such as mathematical formulae may be combined with other steps to produce a patentable process. Id. at 187, 101 S.Ct. 1048. The steps are not to be "dissect[ed]" into new and old steps; it is the entire process that frames the Section 101 inquiry. Id. at 188, 101 S.Ct. 1048.

The Diehr Court did not hold, as the majority opinion states, that transformation of physical state is a requirement of eligibility set by Section 101 unless the process is performed by a machine. It cannot be inferred that the Court silently imposed such a rule. See maj. op. at 956 (relying on lack of repetition in Diehr of the Benson and Flook dis-claimers of requiring machine or transformation, as an implicit rejection of these disclaimers and tacit adoption of the requirement). There was no issue in Diehr of the need for either machine or trans-formation, for both were undisputedly present in the process of curing rubber. It cannot be said that the Court "enunciated" today's "definitive test" in Diehr.[2]

Subsequent Supreme Court authority reinforced the breadth of Section 101

In J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc., 534 U.S. 124, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001), the Court described Section 101 as a "dynamic provision designed to encompass new and unforeseen inventions," id. at 135, 122 S.Ct. 593, that case arising in the context of eligibility of newly developed plant varieties for patenting. The Court stated: "As in Chakrabarty, we decline to narrow the reach of § 101 where Congress has given us no indica-

[2] Many amici curiae pointed out that the Supreme Court did not adopt the test that this court now attributes to it. See, e.g., Br. of Amicus Curiae Am. Intellectual Property Law Ass'n at 18 & n.16; Br. of Amicus Curiae Biotechnology Industry Org. at 17-21; Br. of Amicus Curiae Boston Patent Law Ass'n at 6-8; Br. of Amicus Curiae Business Software Alliance at 13; Br. of Amicus Curiae Federal Circuit Bar Ass'n at 21; Br. of Amicus Curiae Regulatory Datacorp, Inc. at 12-13; Br. of Amicus Curiae Accenture at 16-17; Br. of Amicus Curiae Washington State Patent Law Ass'n at 10-11.

tion that it intends this result." Id. at 145-46, 122 S.Ct. 593. The Court reiterated that "Congress plainly contemplated that the patent laws would be given wide scope," id. at 130, 122 S.Ct. 593 (quoting Chakrabarty, 447 U.S. at 308, 100 S.Ct. 2204), and that the language of Section 101 is "extremely broad," id. This is not language of restriction, and it reflects the statutory policy and purpose of inclusion, not exclusion, in Section 101.

The Court's decisions of an earlier age do not support this court's restrictions of Section 101

My colleagues also find support for their restrictions on patent-eligible "process" inventions in the pre-Section 101 decisions O'Reilly v. Morse, 56 U.S. (15 How.) 62, 14 L.Ed. 601 (1853), Cochrane v. Deener, 94 U.S. 780, 24 L.Ed. 139 (1876), and Tilghman v. Proctor, 102 U.S. 707, 26 L.Ed. 279 (1880). Although the Court in Benson and in Flook took care to state that these early decisions do not require the restrictions that the Court was rejecting, this court now places heavy reliance on these early decisions, which this court describes as "consistent with the machine-or-transformation test later articulated in Benson and reaffirmed in Diehr." Maj. op. at 955. As I have discussed, no such test was "articulated in Benson " and "reaffirmed in Diehr."

However, these early cases do show, contrary to the majority opinion, that a "process" has always been a distinct category of patentable invention, and not tied to either apparatus or transformation, as this court now holds. For example, in Tilghman v. Proctor the Court considered a patent on a process for separating fats and oils, and held that the process was not restricted to any particular apparatus. The Court held

that a process is an independent category of invention, and stated:

> That a patent can be granted for a process, there can be no doubt. The patent law is not confined to new machines and new compositions of matter, but extends to any new and useful art or manufacture.

102 U.S. at 722; see also Corning v. Burden, 56 U.S. (15 How.) 252, 268, 14 L.Ed. 683 (1853) ("It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted, and not for the result or effect itself.") The difference between a process and the other categories of patent-eligible subject matter does not deprive process inventions of the independent status accorded by statute, by precedent, and by logic, all of which negate the court's new rule that a process must be tied to a particular machine or must transform physical matter.

The majority also relies on O'Reilly v. Morse, citing the Court's rejection of Morse's Claim 8 for "the use of the motive power of the electro or galvanic current, which I call electromagnetism, however developed, for making or printing intelligible characters, signs or letters at any distances...." The Court explained:

> In fine he claims an exclusive right to use a manner and process which he has not described and indeed had not invented, and therefore could not describe when he obtained his patent. The Court is of the opinion that the claim is too broad, and not warranted by law.

56 U.S. (15 How.) at 113. However, the claims that were directed to the communication system that was described by Morse were held patentable, although

no machine, transformation, or manufacture was required. See Morse's Claim 5 ("The system of signs, consisting of dots and spaces, and horizontal lines, for numerals, letters, words, or sentences, substantially as herein set forth and illustrated, for telegraphic purposes."). I cannot discern how the Court's rejection of Morse's Claim 8 on what would now be Section 112 grounds, or the allowance of his other claims, supports this court's ruling today. Indeed, Morse's claim 5, to a system of signs, is no more "tangible" than the systems held patentable in Alappat and State Street Bank, discussed post and now cast into doubt, or the Bilski system here held ineligible for access to patenting.

The majority opinion also relies on Cochrane v. Deener, particularly on certain words quoted in subsequent opinions of the Court. In Cochrane the invention was a method for bolting flour, described as a series of mechanical steps in the processing of flour meal. The question before the Court was whether the patented process would be infringed if the same steps were performed using different machinery. The answer was "that a process may be patentable, irrespective of the particular form of the instrumentalities used." 94 U.S. at 788. The Court stressed the independence of a process from the tools that perform it:

> A process is a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the

> process itself may be altogether new, and produce an entirely new result. The process 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.

94 U.S. at 788. The Court did not restrict the kinds of patentable processes; the issue in Cochrane was whether the process must be tied to the machinery that the patentee used to perform it.

This court now cites Cochrane's description of a process as "acts performed upon subject-matter to be transformed and reduced to a different state or thing," id., this court stating that unless there is transformation there is no patentable process. That is not what this passage means. In earlier opinions this court and its predecessor court stated the correct view of this passage, as has the Supreme Court. The Court of Customs and Patent Appeals observed:

> [This Cochrane passage] has sometimes been misconstrued as a 'rule' or 'definition' requiring that all processes, to be patentable, must operate physically on substances. Such a result misapprehends the nature of the passage quoted as dictum, in its context, and the question being discussed by the author of the opinion. To deduce such a rule from the statement would be contrary to its intendment which was not to limit process patentability but to point out that a process is not limited to the means used in performing it.

In re Prater, 56 C.C.P.A. 1381, 415 F.2d 1393, 1403 (1969). Again in In re Schrader, 22 F.3d 290, 295 n. 12 (Fed.Cir.1994) this court noted that Cochrane did not limit patent eligible subject matter to physical

transformation, and that transformation of "intangibles" could qualify for patenting. In AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1358 (Fed.Cir.1999), this court described physical transformation as "merely one example of how a mathematical algorithm may bring about a useful application."

The Court saw the Cochrane decision in its proper perspective. Both Flook and Benson rejected the idea that Cochrane imposed the requirement of either specific machinery or the transformation of matter, as discussed ante. See Flook, 437 U.S. at 588 n. 9, 98 S.Ct. 2522; Benson, 409 U.S. at 71, 93 S.Ct. 253. Nontransformative processes were not at issue in either Cochrane or Diehr, and there is no endorsement in Diehr of a "machine-or-transformation" requirement for patentable processes.

These early cases cannot be held now to require exclusion, from the Section 101 definition of "pro-cess," of all processes that deal with data and information, whose only machinery is electrons, photons, or waves, or whose product is not a transformed physical substance.

The English Statute of Monopolies and English common law do not limit "process" in Section 101

I comment on this aspect in view of the proposal in the concurring opinion that this court's new two-prong test for Section 101 process inventions was implicit in United States law starting with the Act of 1790, because of Congress's knowledge of and importation of English common law and the English Statute of Monopolies of 1623. The full history of patent law in England is too ambitious to be achieved within

the confines of Bilski's appeal,[3] and the concurring opinion's selective treatment of this history may propagate misunderstanding.

The concurrence places primary reliance on the Statute of Monopolies, which was enacted in response to the monarchy's grant of monopolies "to court favorites in goods or businesses which had long before been enjoyed by the public." Graham v. John Deere Co., 383 U.S. 1, 5, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966) (citing Peter Meinhardt, Inventions, Patents and Monopoly 30-35 (1946)). The Statute of Monopolies outlawed these "odious monopolies" or favors of the Crown, but, contrary to the concurring opinion, the Statute had nothing whatever to do with narrowing or eliminating categories of inventive subject matter

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[3] Scholarly histories include M. Frumkin, The Origin of Patents, 27 J.P.O.S. 143 (1945); E. Wyndham Hulme, Privy Council Law and Practice of Letters Patent for Invention from the Restoration to 1794, 33 L.Q. Rev. 63 (Part I), 180 (Part II) (1917); Hulme, On the History of Patent Law in the Seventeenth and Eighteenth Centuries, 18 L.Q. Rev. 280 (1902); Hulme, The History of the Patent System Under the Prerogative and at Common Law, 12 L.Q. Rev. 141 (1896); Ramon A. Klitzke, Historical Background of the English Patent Law, 41 J.P.O.S 615 (1959); Christine MacLeod, Inventing the Industrial Revolution: The English Patent System 1660-1800 (1988); Frank D. Prager, Historic Background and Foundation of American Patent Law, 5 Am. J. Legal Hist. 309 (1961); Brad Sherman & Lionel Bently, The Making of Modern Intellectual Property Law: The British Experience, 1760-1911 (1999); Edward C. Walterscheid, The Early Evolution of the United States Patent Law: Antecedents, printed serially at J. Pat. & Trademark Off. Soc'y ("J.P.T.O.S.") 76:697 (1994) (Part 1); 76:849 (1994) (Part 2); 77:771, 847 (1995) (Part 3); 78:77 (1996) (Part 4); 78:615 (1996) (Part 5, part I); and 78:665 (1996) (Part 5, part II) (hereinafter "Early Evolution"); and Edward C. Walterscheid, To Promote the Progress of Useful Arts: American Patent Law and Administration, 1798-1836 (1998).

eligible for a British patent. See Prager, Historical Background and Foundation of American Patent Law, 5 Am. J. Legal Hist. at 313 ("The statute [of Monopolies] said nothing about meritorious functions of patents, nothing about patent disclosures, and nothing about patent procedures; it was only directed against patent abuses.").

Patents for inventions had been granted by the Crown long before 1623. See Hulme, The History of the Patent System Under the Prerogative and at Common Law, 12 L.Q. Rev. at 143 (the first patent grant to the "introducer of a newly-invented process" was in 1440); Klitzke, Historical Background of the English Patent Law, 41 J.P.O.S. at 626-27 (discussing first patents for "invention" in England in the fifteenth century). That practice was unaffected by the terms of the Statute of Monopolies, which rendered "utterly void" all "Monopolies and all Commissions, Grants, Licenses, Charters and Letters Patent" that were directed to "the sole Buying, Selling, Making, Working or Using any Thing within this Realm," 21 Jac. 1, c.3, § I (Eng.), but which specifically excepted Letters Patent for inventions from that exclusion, id. § VI. The only new limitation on patents for invention was a fourteen-year limit on the term of exclusivity. See Klitzke, Historical Background of the English Patent Law, 41 J.P.O.S. at 649.

The usage "Letters Patent" described one of the forms of document whereby the Crown granted various rights, whether the grant was for an odious monopoly that the Statute of Monopolies eliminated, or for rights to an invention new to England. That usage was not changed by the Statute of Monopolies. Nor were other aspects of the British practice which differed from that enacted in the United States, par-

ticularly the aspect whereby a British patent could be granted to a person who imported something that was new to England, whether or not the import was previously known or the importer was the inventor thereof. In England, "[t]he rights of the inventor are derived from those of the importer, and not vice versa as is commonly supposed." Hulme, The History of the Patent System Under the Prerogative and at Common Law, 12 L.Q.R. at 152; see also MacLeod, Inventing the Industrial Revolution 13 ("The rights of the first inventor were understood to derive from those of the first importer of the invention.").

In contrast, in the United States the patent right has never been predicated upon importation, and has never been limited to "manufactures." See, e.g., Walterscheid, To Promote the Progress of Useful Arts 93, 137-38, 224; see also Prager, Historic Background and Foundation of American Patent Law, 5 Am. J. Legal Hist. at 309 ("The American Revolution destroyed many of the ancient customs; it brought a sweeping reorientation of patent law, with new forms, new rules, new concepts, and new ideals."). The differences between the American and English patent law at this nation's founding were marked, and English judicial decisions interpreting the English statute are of limited use in interpreting the United States statute. In all events, no English decision supports this court's new restrictive definition of "process."

The concurrence proposes that the Statute of Monopolies provides a binding definition of the terms "manufacture," "machine," "composition of matter," and "process" in Section 101 of the U.S. Patent Act. See concurring op. at 968-70. The only one of these terms that appears in the Statute of Monopolies is

"manufacture", a broad term that reflects the usage of the period. Even at the time of this country's founding, the usage was broad, as set forth in Samuel Johnson's Dictionary of the English Language (3d. ed. 1768), which defines "manufacture" as "any thing made by art," and defines "art" as "the power of doing something not taught by nature and instinct"; "a science"; "a trade"; "artfulness"; "skill"; "dexterity." Historians explain that England's primary motive for patenting was to promote "[a]cquisition of superior Continental technology" at a time when England lagged behind, see MacLeod, Inventing the Industrial Revolution 11; this cannot be interpreted to mean that England and perforce the United States intended to eliminate "processes" from this incentive system. It is inconceivable that on this background the Framers, and again the enactors of the first United States patent statutes in 1790 and 1793, intended sub silentio to impose the limitations on "process" now created by this court.

Congress' earliest known draft patent bill included the terms "art, manufacture, engine, machine, invention or device, or any improvement upon the same." Walterscheid, To Promote the Progress of Useful Arts 92. The 1793 Act explicitly stated "any new and useful art," § 1, 1 Stat. 318 (1793), a usage that was carried forward until "art" was replaced with "process" in 35 U.S.C. § 101 and defined in § 100(b). Historians discuss that Congress' inclusion of any "art" or "process" in the patent system was a deliberate clarification of the English practice. See Walterscheid, To Promote the Progress of Useful Arts 93 ("[The first patent bill] appears to be an obvious attempt to deal legislatively with issues that were beginning to be addressed by the English courts.... [I]t states unequivocally that improvement inventions are pat-

entable and expands the definition of invention or discovery beyond simply 'manufacture.'"); Karl B. Lutz, Patents and Science: A Clarification of the Patent Clause of the U.S. Constitution, 32 J.P.O.S. 83, 86 (1950) ("By the year 1787 it was being recognized even in Great Britain that the phrase 'new manufactures' was an unduly limited object for a patent system, since it seems to exclude new processes.... [This question was] resolved in the United States Constitution by broadening the field from 'new manufactures' to 'useful arts'....").

In interpreting a statute, it is the language selected by Congress that occupies center stage: "[O]ur obligation is to take statutes as we find them, guided, if ambiguity appears, by the legislative history and statutory purpose." Chakrabarty, 447 U.S. at 315, 100 S.Ct. 2204. The Court has "perceive[d] no ambiguity" in Section 101, leaving no need for foreign assistance. Id. The legislative choice to afford the patent system "wide scope," id. at 308, 100 S.Ct. 2204, including "process" inventions, evolved in the United States independent of later developments of the common law in England.

The concurrence concludes that the Statute of Monopolies foreclosed the future patenting of any-thing that the concurrence calls a "business method"-the term is not defined-whether or not the method is new, inventive, and useful. But the Statute of Monopolies only foreclosed "odious" monopolies, illustrated by historical reports that Queen Elizabeth had granted monopolies on salt, ale, saltpeter, white soap, dredging machines, playing cards, and rape seed oil, and on processes and services such as Spanish leather-making, mining of various metals and ores, dying and dressing cloth, and iron tempering. See

Walterscheid, Early Evolution (Part 2), 76 J.P.T.O.S. at 854 n.14; Klitzke, Historical Background of the English Patent Law, 41 J.P.O.S. at 634-35. These and other grants, many of which were implemented by Letters Patent, were the "odious monopolies" that were rendered illegal. They included several classes of known activity, product and process, and had nothing to do with new "inventions." The Statute of Monopolies cannot be held to have restricted the kinds of new processes that can today be eligible for patenting in the United States, merely because it outlawed patents on non-novel businesses in England. The presence or absence of "organizing human activity," a vague term created by the concurrence, has no connection or relevance to Parliament's elimination of monopoly patronage grants for old, established arts. The Statute of Monopolies neither excluded nor included inventions that involve human activity, although the words "the sole working or making in any manner of new manufactures" pre-suppose human activity. 21 Jac. 1, c.3, § VI (emphases added). We are directed to no authority for the proposition that a new and inventive process involving "human activity" has historically been treated differently from other processes; indeed, most inventions involve human activity.

The concurrence has provided hints of the complexity of the evolution of patent law in England, as in the United States, as the Industrial Revolution took hold. Historians have recognized these complexities. See, e.g., Walterscheid, To Promote the Progress of Useful Arts 5 ("[T]he American patent law almost from its inception departed from its common law counterpart in the interpretation that would be given to the definition of novelty...."); Klitzke, Historical Background of the English Patent Law, 41 J.P.O.S.

at 638 (noting that in Elizabethan times, novelty only required a showing that "the industry had not been carried on within the realm within a reasonable period of time", while today "the proof of a single public sale of an article" or a "printed publication" can negate patentability).

I caution against over-simplification, particularly in view of the uncertainties in English common law at the time of this country's founding. See Boulton v. Bull, 2 H. Bl. 463, 491 (C.P.1795) (Eyre, C.J.) ("Patent rights are no where that I can find accurately discussed in our books."); MacLeod, Inventing the Industrial Revolution 61 ("It was only from the time when the Privy Council relinquished jurisdiction that a case law on patents began to develop.... But it was a slow process and even the spate of hard-fought patent cases at the end of the eighteenth century did little to establish a solid core of judicial wisdom."). The English judicial opinions of the eighteenth century were not as limiting on the United States as my colleagues suggest. See Walterscheid, The Nature of the Intellectual Property Clause: A Study in Historical Perspective 355 (2002) ("In the eighteenth century, patentees and those who gave advice con-cerning patents were certainly of the view that the Statute did not preclude the patenting of general principles of operation."); see also MacLeod, Inventing the Industrial Revolution 63-64.

It is reported that in the century and a half following enactment of the Statute of Monopolies, the English patent registers were replete with inventions claimed as "processes." See Walterscheid, Early Evolution (Part 3), 77 J.P.T.O.S. at 856 ("As one of the earliest texts on the patent law stated in 1806: "most of the patents now taken out, are by name, for

the method of doing particular things....”). The concurrence agrees; but it is also reported that because patents were not litigated in the common law courts until the Privy Council authorized such suits in 1752, judicial interpretation of various aspects of patent law were essentially absent until about the time this country achieved independence, leading to the variety of views expressed in Boulton v. Bull. The legislators in the new United States cannot now be assigned the straightjacket of law not yet developed in England. Indeed, the first patent granted by President Washington, upon examination by Secretary of State Jefferson, was for a method of “making Pot-ash and Pearl-ash,” a process patent granted during the period that the concurrence states was fraught with English uncertainty about process patents. See The First United States Patent, 36 J.P.O.S. 615, 616-17 (1954).

The concurrence lists some English process patents predating the United States’ 1793 Patent Act, and argues that processes not sufficiently “like” these archaic inventions should not now be eligible for patenting. I refer simply to Flook, 437 U.S. at 588 n. 9, 98 S.Ct. 2522, where the Court stated: “As in Benson, we assume that a valid process patent may issue even if it does not meet one of the qualifications of our earlier precedents.” Similarly, the Chakrabarty Court stated: “[A] statute is not to be confined to the particular applications ... contemplated by the legislators. This is especially true in the field of patent law.” Chakrabarty, 447 U.S. at 315-16, 100 S.Ct. 2204 (citing Barr v. United States, 324 U.S. 83, 90, 65 S.Ct. 522, 89 L.Ed. 765 (1945); Browder v. United States, 312 U.S. 335, 339, 61 S.Ct. 599, 85 L.Ed. 862 (1941); Puerto Rico v. Shell Co., 302 U.S. 253, 257, 58 S.Ct. 167, 82 L.Ed. 235 (1937)). The meaning of the

statutory term "process" is not limited by particular examples from more than two hundred years ago.

However, I cannot resist pointing to the "business method" patents on Woodcroft's list. See concurring op. at 973 (citing No. 1197 to John Knox (July 21, 1778) ("Plan for assurances on lives of persons from 10 to 80 years of age.")). Several other process patents on Woodcroft's list appear to involve financial subject matter, and to require primarily human activity. See, e.g., No. 1170 to John Molesworth (Sept. 29, 1777) ("Securing to the purchasers of shares and chances of state-lottery tickets any prize drawn in their favor."); No. 1159 to William Nicholson (July 14, 1777) ("Securing the property of persons purchasing shares of State-lottery tickets."), cited in Bennet Woodcroft, Alphabetical Index of Patentees of Inventions 383, 410 (U.S. ed.1969). Other English process patents from the several decades following 1793 can aptly be described as "business methods," although not performed with the aid of computers. E.g., No. 10,367 to George Robert D'Harcourt (Oct. 29, 1844) ("Ascertaining and checking the number of checks or tickets which have been used and marked, applicable for railway officers.").

While most patents of an earlier era reflect the dominant mechanical and chemical technologies of that era, modern processes reflect the dramatic advances in telecommunications and computing that have occurred since the time of George III. See USPTO White Paper, Automated Financial or Management Data Processing Methods (Business Methods) 4 (2000), available at http://www.uspto.gov/web/menu/busmethp/ whitepaper.pdf (hereinafter USPTO White Paper) ("The full arrival of electricity as a component in business data processing system[s]

was a watershed event."). It is apparent that economic, or "business method," or "human activity" patents were neither explicitly nor implicitly foreclosed from access to the English patent system.

Evolution of process patents in the United States

The United States' history of patenting establishes the same point. The PTO has located various patents predating modern computer usages that can be described as financial or business methods. The USPTO White Paper at 3-4 and appendix A describes the history of financial apparatus and method patents dating back to 1799, including patents on bank notes, bills of credit, bills of exchange, check blanks, detecting and preventing counterfeiting, coin counting, interest calculation tables, and lotteries, all within the first fifty years of the United States patent system. It is a distortion of these patents to describe the processes as "tied to" another statutory category-that is, paper and pencil. Concurring op. at 974-75 & n. 18. Replacement of paper with a computer screen, and pencil with electrons, does not "untie" the process. Fairly considered, the many older financial and business-oriented patents that the PTO and many of the amici have identified are of the same type as the Bilski claims; they were surely not rendered patent-eligible solely because they used "paper" to instantiate the financial strategies and transactions that comprised their contribution.

I do not disagree with the general suggestion that statutes intended to codify the existing common law are to be interpreted in light of then-contemporary practice, including, if relevant, the English cases. See concurring op. at 972-73. However, the court must be scrupulous in assessing the relevance of decisions that were formulated on particularized facts involv-

ing the technology of the period. The United States Supreme Court has never held that "process" inventions suffered a second-class status under our statutes, achieving patent eligibility only derivatively through an explicit "tie" to another statutory category. The Court has repeatedly disparaged efforts to read in restrictions not based on statutory language. See Diehr, 450 U.S. at 182, 101 S.Ct. 1048; Chakrabarty, 447 U.S. at 308, 100 S.Ct. 2204. Yet second-class status is today engrafted on "process" inventions. There is plainly no basis for such restriction, which is a direct path to the "gloomy thought" that concerned Senator O.H. Platt in his Remarks in Congress at the Centennial Proceedings of the United States Patent System:

> For one, I cannot entertain the gloomy thought that we have come to that century in the world's life in which new and grander achievements are impossible.... Invention is a prolific mother; every inventive triumph stimulates new effort. Man never is and never will be content with success, and the great secrets of nature are as yet largely undiscovered.

Invention and Advancement (1891), reprinted in United States Bicentennial Commemorative Edition of Proceedings and Addresses: Celebration of the Beginning of the Second Century of the American Patent System 75-76 (1990).

In sum, history does not support the retrogression sponsored by the concurrence.

This court now rejects its own CCPA and Federal Circuit precedent

The majority opinion holds that there is a Supreme Court restriction on process patents, "enunciated" in

Benson, Flook, and Diehr; and that this restriction was improperly ignored by the Federal Circuit and the Court of Customs and Patent Appeals, leading us into error which we must now correct. Thus this court announces that our prior decisions may no longer be relied upon. Maj. op. at 959-60 & nn. 17, 19. The effect on the patents and businesses that did rely on them is not considered.

The Court's decisions in Benson, Flook, and Diehr all reached the Supreme Court by way of the CCPA, and the CCPA successively implemented the Court's guidance in establishing the Freeman/Walter/Abele test for eligibility under Section 101. The Federal Circuit continued to consider computer-facilitated processes, as in Arrhythmia Research Technology, 958 F.2d at 1059-60, where patent-eligibility was confirmed for a computer-assisted mathematical analysis of electrocardiograph signals that determined the likelihood of recurrence of heart attack. This court now rules that this precedent "should no longer be relied on." Maj. op. at 959 n. 17.

In In re Alappat, 33 F.3d 1526 (Fed.Cir.1994) (en banc) the question was the eligibility for patent of a rasterizer that mathematically transforms data to eliminate aliasing in a digital oscilloscope. The court held that a computer-implemented system that produces a "useful, concrete, and tangible result" is Section 101 subject matter. Id. at 1544. This court now rules that "a 'useful, concrete and tangible result' analysis should no longer be relied on." Maj. op. at 960 n. 19.

The Alappat court stressed the intent, embodied in the language of the statute, that the patent system be broadly available to new and useful inventions:

> The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and other parts of Title 35.

33 F.3d at 1542. This court looked to the Supreme Court's guidance in its Section 101 decisions, and explained:

> A close analysis of Diehr, Flook, and Benson reveals that the Supreme Court never intended to create an overly broad, fourth category of [mathematical] subject matter excluded from § 101. Rather, at the core of the Court's analysis in each of these cases lies an attempt by the Court to explain a rather straightforward concept, namely, that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, and thus that subject matter is not, in and of itself, entitled to patent protection.

Id. at 1543 (emphasis in original). The court cited the Supreme Court's distinction between abstract ideas and their practical application, and stated of the claimed rasterizer: "This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." Id. at 1544.

This principle was applied to a computer-implemented data processing system for managing pooled mutual fund assets in State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed.Cir.1998), and to a method for

recording and processing telephone data in AT&T v. Excel. The court explained that processes that include mathematical calculations in a practical application can produce a useful, concrete, and tangible result, which in State Street Bank was "expressed in numbers, such as price, profit, percentage, cost, or loss." 149 F.3d at 1375. In AT&T v. Excel the court applied State Street Bank and Diehr, and stated that "physical transformation ... is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application" and thus achieve a useful, concrete, and tangible result. 172 F.3d at 1358. This analysis, too, can no longer be relied on. Maj. op. at 960 n. 19.

The now-discarded criterion of a "useful, concrete, and tangible result" has proved to be of ready and comprehensible applicability in a large variety of processes of the information and digital ages. The court in State Street Bank reinforced the thesis that there is no reason, in statute or policy, to exclude computer-implemented and information-based inventions from access to patentability. The holdings and reasoning of Alappat and State Street Bank guided the inventions of the electronic age into the patent system, while remaining faithful to the Diehr distinction between abstract ideas such as mathematical formulae and their application in a particular process for a specified purpose. And patentability has always required compliance with all of the requirements of the statute, including novelty, non-obviousness, utility, and the provisions of Section 112.

The public has relied on the rulings of this court and of the Supreme Court

The decisions in Alappat and State Street Bank confirmed the patent eligibility of many evolving

areas of commerce, as inventors and investors explored new technological capabilities. The public and the economy have experienced extraordinary advances in information-based and computer-managed processes, supported by an enlarging patent base. The PTO reports that in Class 705, the examination classification associated with "business methods" and most likely to receive inventions that may not use machinery or transform physical matter, there were almost 10,000 patent applications filed in FY 2006 alone, and over 40,000 applications filed since FY 98 when State Street Bank was decided. See Wynn W. Coggins, USPTO, Update on Business Methods for the Business Methods Partnership Meeting 6 (2007) (hereinafter "PTO Report"), available at http://www.uspto.gov/web/menu/pbmethod/partnership.pps. An amicus in the present case reports that over 15,000 patents classified in Class 705 have issued. See Br. of Amicus Curiae Accenture, at 22 n.20.[4] The industries identified with information-based and data-handling processes, as several amici curiae explain and illustrate, include fields as diverse as banking and finance, insurance, data processing, industrial engineering, and medicine.

Stable law, on which industry can rely, is a foundation of commercial advance into new products and processes. Inventiveness in the computer and information services fields has placed the United States in a position of technological and commercial preeminence. The information technology industry is

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[4] The PTO recognizes that patents on "business methods" have been eligible subject matter for two centuries. See USPTO White Paper 2 ("Financial patents in the paper-based technologies have been granted continuously for over two hundred years.").

reported to be "the key factor responsible for reversing the 20-year productivity slow-down from the mid-1970s to the mid-1990s and in driving today's robust productivity growth." R.D. Atkinson & A.S. McKay, Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution 10 (Info. Tech. & Innovation Found.2007), available at http://www.itif.org/files/digital_prosperity.pdf. By revenue estimates, in 2005 the software and information sectors constituted the fourth largest industry in the United States, with significantly faster growth than the overall U.S. economy. Software & Info. Indus. Ass'n, Software and Information: Driving the Knowledge Economy 7-8 (2008), http://www.siia.net/estore/globecon-08.pdf. A Congressional Report in 2006 stated:

> As recently as 1978, intangible assets, such as intellectual property, accounted for 20 percent of corporate assets with the vast majority of value (80 percent) attributed to tangible assets such as facilities and equipment. By 1997, the trend reversed; 73 percent of corporate assets were intangible and only 27 percent were tangible.

H.R.Rep. No. 109-673 (accompanying a bill concerning judicial resources).

This powerful economic move toward "intangibles" is a challenge to the backward-looking change of this court's ruling today. Until the shift represented by today's decision, statute and precedent have provided stability in the rapidly moving and commercially vibrant fields of the Information Age. Despite the economic importance of these interests, the consequences of our decision have not been considered. I don't know how much human creativity and

commercial activity will be devalued by today's change in law; but neither do my colleagues.

The Section 101 interpretation that is now uprooted has the authority of years of reliance, and ought not be disturbed absent the most compelling reasons. "Considerations of stare decisis have special force in the area of statutory interpretation, for here, unlike in the context of constitutional interpretation, the legislative power is implicated, and Congress remains free to alter what [the courts] have done." Shepard v. United States, 544 U.S. 13, 23, 125 S.Ct. 1254, 161 L.Ed.2d 205 (2005) (quoting Patterson v. McLean Credit Union, 491 U.S. 164, 172-73, 109 S.Ct. 2363, 105 L.Ed.2d 132 (1989)); see also Hilton v. S.C. Pub. Railways Comm'n, 502 U.S. 197, 205, 112 S.Ct. 560, 116 L.Ed.2d 560 (1991) (in cases of statutory interpretation the importance of adhering to prior rulings is "most compelling"). Where, as here, Congress has not acted to modify the statute in the many years since Diehr and the decisions of this court, the force of stare decisis is even stronger. See Shepard, 544 U.S. at 23, 125 S.Ct. 1254.

Adherence to settled law, resulting in settled expectations, is of particular importance "in cases involving property and contract rights, where reliance interests are involved." Payne v. Tennessee, 501 U.S. 808, 828, 111 S.Ct. 2597, 115 L.Ed.2d 720 (1991); see also United States v. Title Ins. & Trust Co., 265 U.S. 472, 486, 44 S.Ct. 621, 68 L.Ed. 1110 (1924) (declining to overrule precedent where prior ruling "has become a rule of property, and to disturb it now would be fraught with many injurious results"). This rationale is given no weight by my colleagues, as this court gratuitously disrupts decades of law underlying our own rulings. The only

announced support for today's change appears to be the strained new reading of Supreme Court quotations. But this court has previously read these decades-old opinions differently, without objection by either Congress or the Court. My colleagues do not state a reason for their change of heart. See Benjamin N. Cardozo, The Nature of the Judicial Process 149 (1921) ("[T]he labor of judges would be increased almost to the breaking point if every past decision could be reopened in every case, and one could not lay one's own course of bricks on the secure foundation of the courses laid by others who had gone before him.").

It is the legislature's role to change the law if the public interest so requires. In Chakrabarty the Court stated: "The choice we are urged to make is a matter of high policy for resolution within the legislative process after the kind of investigation, examination, and study that legislative bodies can provide and courts cannot." 447 U.S. at 317, 100 S.Ct. 2204; see also Flook, 437 U.S. at 595, 98 S.Ct. 2522 ("Difficult questions of policy concerning the kinds of programs that may be appropriate for patent protection and the form and duration of such protection can be answered by Congress on the basis of current empirical data not equally available to this tribunal.").

It is, however, the judicial obligation to assure a correct, just, and reliable judicial process, and particularly to respect the principles of stare decisis in an area in which prior and repeated statutory interpretations have been relied upon by others. See, e.g., Shepard, 544 U.S. at 23, 125 S.Ct. 1254 ("[T]he claim to adhere to case law is generally powerful once a decision has settled statutory meaning."); Hilton, 502 U.S. at 202, 112 S.Ct. 560 ("Adherence to

precedent promotes stability, predictability, and respect for judicial authority."); Payne, 501 U.S. at 827, 111 S.Ct. 2597 ("Stare decisis is the preferred course because it promotes the evenhanded, predictable, and consistent development of legal principles, fosters reliance on judicial decisions, and contributes to the actual and perceived integrity of the judicial process."). These considerations appear to be abandoned.

Uncertain guidance for the future

Not only past expectations, but future hopes, are disrupted by uncertainty as to application of the new restrictions on patent eligibility. For example, the court states that even if a process is "tied to" a machine or transforms matter, the machine or transformation must impose "meaningful limits" and cannot constitute "insignificant extra-solution activity". Maj. op. at 961-62. We are advised that transformation must be "central to the purpose of the claimed process," id., although we are not told what kinds of transformations may qualify, id. at 962-63. These concepts raise new conflicts with precedent.

This court and the Supreme Court have stated that "there is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention in a combination patent." Allen Eng'g Corp. v. Bartell Industries, Inc., 299 F.3d 1336, 1345 (Fed.Cir.2002) (quoting Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336, 345, 81 S.Ct. 599, 5 L.Ed.2d 592 (1961)). This rule applies with equal force to process patents, see W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1548 (Fed.Cir.1983) (there is no gist of the invention rule for process patents), and is in accord with the rule that the invention must be considered as a whole, rather than

"dissected," in assessing its patent eligibility under Section 101, see Diehr, 450 U.S. at 188, 101 S.Ct. 1048. It is difficult to predict an adjudicator's view of the "invention as a whole," now that patent examiners and judges are instructed to weigh the different process components for their "centrality" and the "significance" of their "extra-solution activity" in a Section 101 inquiry.

As for whether machine implementation will impose "meaningful limits in a particular case," the "meaningfulness" of computer usage in the great variety of technical and informational subject matter that is computer-facilitated is apparently now a flexible parameter of Section 101. Each patent examination center, each trial court, each panel of this court, will have a blank slate on which to uphold or invalidate claims based on whether there are sufficient "meaningful limits", or whether a transformation is adequately "central," or the "significance" of process steps. These qualifiers, appended to a novel test which itself is neither suggested nor supported by statutory text, legislative history, or judicial precedent, raise more questions than they answer. These new standards add delay, uncertainty, and cost, but do not add confidence in reliable standards for Section 101.

Other aspects of the changes of law also contribute uncertainty. We aren't told when, or if, software instructions implemented on a general purpose computer are deemed "tied" to a "particular machine," for if Alappat's guidance that software converts a general purpose computer into a special purpose machine remains applicable, there is no need for the present ruling. For the thousands of inventors who

obtained patents under the court's now-discarded criteria, their property rights are now vulnerable.

The court also avoids saying whether the State Street Bank and AT&T v. Excel inventions would pass the new test. The drafting of claims in machine or process form was not determinative in those cases, for "we consider the scope of § 101 to be the same regardless of the form-machine or process-in which a particular claim is drafted." AT&T v. Excel, 172 F.3d at 1357. From either the machine or the transformation viewpoint, the processing of data representing "price, profit, percentage, cost, or loss" in State Street Bank is not materially different from the processing of the Bilski data representing commodity purchase and sale prices, market trans-actions, and risk positions; yet Bilski is held to fail our new test, while State Street is left hanging. The uncertainty is illustrated in the contemporaneous decision of In re Comiskey, 499 F.3d 1365, 1378-79 (Fed.Cir.2007), where the court held that "systems that depend for their operation on human intelligence alone" to solve practical problems are not within the scope of Section 101; and In re Nuijten, 500 F.3d 1346, 1353-54 (Fed.Cir.2007), where the court held that claims to a signal with an embedded digital watermark encoded according to a given encoding process were not directed to statutory subject matter under Section 101, although the claims included "physical but transitory forms of signal transmission such as radio broadcasts, electrical signals through a wire, and light pluses through a fiber-optic cable."

Although this uncertainty may invite some to try their luck in court, the wider effect will be a disincentive to innovation-based commerce. For inventors, investors, competitors, and the public, the

most grievous consequence is the effect on inventions not made or not developed because of uncertainty as to patent protection. Only the successes need the patent right.

The Bilski invention has not been examined for patentability

To be patentable, Bilski's invention must be novel and non-obvious, and the specification and claims must meet the requirements of enablement, description, specificity, best mode, etc. See 35 U.S.C. § 101 ("Whoever invents or discovers a new and useful process ... may obtain a patent therefor, subject to the conditions and requirements of this title."); Diehr, 450 U.S. at 190, 101 S.Ct. 1048 (the question of whether an invention is novel is distinct from whether the subject matter is statutory); State Street Bank, 149 F.3d at 1377 ("Whether the patent's claims are too broad to be patentable is not to be judged under § 101, but rather under §§ 102, 103, and 112."). I don't know whether Bilski can meet these requirements—but neither does this court, for the claims have not been examined for patentability, and no rejections apart from Section 101 are included in this appeal.

Instead, the court states the "true issue before us" is "whether Applicants are seeking to claim a fundamental principle (such as an abstract idea) or mental process," maj. op. at 952, and answers "yes." With respect, that is the wrong question, and the wrong answer. Bilski's patent application describes his process of analyzing the effects of supply and demand on commodity prices and the use of a coupled transaction strategy to hedge against these risks; this is not a fundamental principle or an abstract idea; it is not a mental process or a law of nature. It is a

"process," set out in successive steps, for obtaining and analyzing information and carrying out a series of commercial transactions for the purpose of "managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price." Claim 1, preamble.

Because the process Bilski describes employs complex mathematical calculations to assess various elements of risk, any practicable embodiment would be conducted with the aid of a machine—a programmed computer-but the court holds that since computer-implementation is not recited in claim 1, for that reason alone the process fails the "machine" part of the court's machine-or-transformation test. Maj. op. at 962. And the court holds that since Bilski's process involves the processing of data concerning commodity prices and supply and demand and other risk factors, the process fails the "transformation" test because no "physical objects or substances" are transformed. Maj. op. at 963-64. The court then concludes that because Bilski's Claim 1 fails the machine-or-transformation test it ipso facto preempts a "fundamental principle" and is thereby barred from the patent system under Section 101: an illogical leap that displays the flaws in the court's analysis.

If a claim is unduly broad, or if it fails to include sufficient specificity, the appropriate ground of rejection is Section 112, for claims must "particularly point out and distinctly claim[ ]" the invention. See In re Vaeck, 947 F.2d 488, 495-96 (Fed. Cir. 1991) (affirming rejection under Section 112 where "[t]here is no reasonable correlation between the narrow disclosure in applicant's specification and the broad scope of protection sought in the claims"); In re

Foster, 58 C.C.P.A. 1001, 438 F.2d 1011, 1016 (1971) (claims "not commensurate with appellants' own definition of what they are seeking to cover" are rejected under Section 112, rather than Section 101); In re Prater, 415 F.2d at 1403-04 (applying Section 112 to claims that included mental steps). The filing of a broader claim than is supported in the specification does not convert the invention into an abstraction and evict the application from eligibility for examination. A broad first claim in a patent application is routine; it is not the crisis event postulated in the court's opinion.

The role of examination is to determine the scope of the claims to which the applicant is entitled. See 37 C.F.R. § 1.104(a). The PTO's regulations provide:

> On taking up an application for examination or a patent in a reexamination proceeding, the examiner shall make a thorough study thereof and shall make a thorough investigation of the avail-able prior art relating to the subject matter of the claimed invention. The examination shall be complete with respect to both compliance of the application or patent under reexamination with the applicable statutes and rules and to the patentability of the invention as claimed, as well as with respect to matters of form, unless otherwise indicated.

Id. § 1.104(a)(1). The Manual of Patent Examining Procedure (MPEP) similarly instructs the examiners to conduct a "thorough search of the prior art" before evaluating the invention under Section 101. MPEP § 2106(III) (8th ed., rev.7, July.2008) ("Prior to evaluating the claimed invention under 35 U.S.C. § 101, USPTO personnel are expected to conduct a thorough search of the prior art."). The MPEP also

requires examiners to identify all grounds of rejection in the first official PTO action to avoid unnecessary delays in examination. Id.§ 2106(II) ("Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement."). I note that this requirement does not appear to have been here met.

Several amici curiae referred to the difficulties that the PTO has reported in examining patents in areas where the practice has been to preserve secrecy, for published prior art is sparse. The Federal Trade Commission recognized that the problem of "questionable" patents stems mostly from "the difficulty patent examiners can have in considering all the relevant prior art in the field and staying informed about the rapid advance of computer science." FTC, To Promote Innovation: The Proper Balance of Competition & Patent Law and Policy at ch. 3, pp. 44 (Oct.2003), available at http://www.ftc.gov/os/2003/10/innovationrpt.pdf. However, this problem seems to be remedied, for the PTO reported in 2007 that for Class 705, "[t]he cases the examiners are now working on have noticeably narrower claims" than the cases filed in or before FY 2000. PTO Report at 9. The PTO reports that its search fields have been enlarged, staff added, and supervision augmented. FTC Report at ch. 1, p. 30. ("Since the PTO introduced [these changes] the allowance rate for business method patents has decreased, and the PTO believes that this decreased allowance rate indicates improved PTO searches for prior art."). If this court's purpose now is to improve the quality of issued patents by eliminating access to patenting for large

classes of past, present, and future inventions, the remedy would appear to be excessive.

A straightforward, efficient, and ultimately fair approach to the evaluation of "new and useful" processes-quoting Section 101-is to recognize that a process invention that is not clearly a "fundamental truth, law of nature, or abstract idea" is eligible for examination for patentability. I do not suggest that basic scientific discoveries are a proper subject matter of patents (the Court in Chakrabarty mentioned $E=mc^2$ and the law of gravity), and I do not attempt an all-purpose definition of the boundary between scientific theory and technological application. But it is rare indeed that a question arises at the boundary of basic science; more usual is the situation illustrated by Samuel Morse's telegraph, in which the Court simply held that Morse's general claim was "too broad," exceeding the scope of his practical application.

Bilski's process for determining risk in commodity transactions does not become an abstraction because it is broadly claimed in his first claim. It may be claimed so broadly that it reads on the prior art, but it is neither a fundamental truth nor an abstraction. Bilski's ten other claims contain further details and limitations, removing them farther from abstraction. Although claim 1 may have been deemed "representative" with respect to Section 101, the differences among the claims may be significant with respect to Sections 102, 103, and 112. Bilski's application, now pending for eleven years, has yet to be examined for patentability.

CONCLUSION

In sum, the text of Section 101, its statutory history, its interpretation by the Supreme Court, and

its application by the courts, contravene this court's redefinition of the statutory term "process." The court's decision affects present and future rights and incentives, and usurps the legislative role. The judicial role is to support stability and predictability in the law, with fidelity to statute and precedent, and respect for the principles of stare decisis.

Patents provide an incentive to invest in and work in new directions. In United States v. Line Material Co., 333 U.S. 287, 332, 68 S.Ct. 550, 92 L.Ed. 701 (1948), Justice Burton, joined by Chief Justice Vinson and Justice Frankfurter, remarked that "the frontiers of science have expanded until civilization now depends largely upon discoveries on those frontiers to meet the infinite needs of the future. The United States, thus far, has taken a leading part in making those discoveries and in putting them to use." This remains true today. It is antithetical to this incentive to restrict eligibility for patenting to what has been done in the past, and to foreclose what might be done in the future.

MAYER, Circuit Judge, dissenting.

The en banc order in this case asked: "Whether it is appropriate to reconsider State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed.Cir.1998), and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed.Cir.1999), in this case and, if so, whether those cases should be overruled in any respect?" I would answer that question with an emphatic "yes." The patent system is intended to protect and promote advances in science and technology, not ideas about how to structure commercial transactions. Claim 1 of the application of Bernard L. Bilski and Rand A. Warsaw ("Bilski") is not eligible for patent protection because it is directed to a method of conducting business. Affording patent protection to business methods lacks constitutional and statutory support, serves to hinder rather than promote innovation and usurps that which rightfully belongs in the public domain. State Street and AT & T should be overruled.

I.

In discussing the scope of copyright protection, the Supreme Court has noted that "'a page of history is worth a volume of logic.'" Eldred v. Ashcroft, 537 U.S. 186, 200, 123 S.Ct. 769, 154 L.Ed.2d 683 (2003) (quoting New York Trust Co. v. Eisner, 256 U.S. 345, 349, 41 S.Ct. 506, 65 L.Ed. 963 (1921)). The same holds true with respect to patent protection. From a historical perspective, it is highly unlikely that the framers of the Constitution's intellectual property clause intended to grant patent protection to methods of conducting business. To the contrary, "those who formulated the Constitution were familiar with the long struggle over monopolies so prominent in English history, where exclusive rights to engage

even in ordinary business activities were granted so frequently by the Crown for the financial benefits accruing to the Crown only." In re Yuan, 38 C.C.P.A. 967, 188 F.2d 377, 380 (1951). The Statute of Monopolies,[1] enacted in 1624, curtailed the Crown's ability to grant "monopolies to court favorites in goods or businesses which had long before been enjoyed by the public." Graham v. John Deere Co., 383 U.S. 1, 5, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). When drafting the Constitution, the framers were well aware of the abuses that led to the English Statute of Monopolies and therefore "consciously acted to bar Congress from granting letters patent in particular types of business." In re Comiskey, 499 F.3d 1365, 1375 (Fed.Cir.2007); see also Malla Pollack, The Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Consideration, and Constitutional History, 28 Rutgers Computer & Tech. L.J. 61, 90 (2002) ("[T]he ratifying generation did not agree to invention patents on advances in trade itself, because trade monopolies were odious.").

There is nothing in the early patent statutes to indicate that Congress intended business methods to constitute patentable subject matter. See Patent Act of 1790 § 4, 1 Stat. 109, 111 (1790); Patent Act of 1793 § 1, 1 Stat. 318, 319 (1793); Pollack, supra at 106 ("[I]f any nation was ripe for invention patents on business methods, it was the newly freed colonies of

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[1] The Statute of Monopolies "grew out of abuses in the grant of exclusive franchises in various lines of business such as trading cards, alehouses and various staple products." Robert P. Merges, As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform, 14 Berkeley Tech. L.J. 577, 585 (1999).

British North America.... [H]owever, no business method patents seem to have been granted."). As early as 1869, the Commissioner of Patents said that "[i]t is contrary ... to the spirit of the law, as construed by the office for many years, to grant patents for methods of book-keeping," Ex parte Abraham, 1869 Dec. Comm'r Pat. 59, 59 (1869), and by 1893 the courts had concluded that "a method of transacting common business ... does not seem to be patentable as an art," United States Credit Sys. Co. v. Am. Credit Indem. Co., 53 F. 818, 819 (C.C.S.D.N.Y.1893), aff'd on other grounds, 59 F. 139 (2d Cir.1893). By 1952, when Congress enacted the current Patent Act, it was widely acknowledged that methods of doing business were ineligible for patent protection. See, e.g., Loew's Drive-In Theatres, Inc. v. Park-In Theatres, Inc., 174 F.2d 547, 552 (1st Cir.1949) ("[A] system for the transaction of business ... however novel, useful, or commercially successful is not patentable apart from the means for making the system practically useful, or carrying it out."); In re Patton, 29 C.C.P.A. 982, 127 F.2d 324 (1942) (noting that "a system of transacting business, apart from the means for carrying out such system" is not patentable); Hotel Sec. Checking Co. v. Lorraine Co., 160 F. 467, 469 (2d Cir.1908) ("A system of transacting business disconnected from the means for carrying out the system is not, within the most liberal interpretation of the term, an art."); In re Moeser, 27 App. D.C. 307, 310 (1906) (holding that a system for burial insurance contracts was not patentable because "contracts or proposals for contracts, devised or adopted as a method of transacting a particular class of ... business, [are] not patentable as an art"); see also 145 Cong. Rec. H6,947 (Aug. 3, 1999) (statement of Rep. Manzullo) ("Before the State

Street Bank and Trust case ... it was universally thought that methods of doing or conducting business were not patentable items.”).

In passing the 1952 Act, Congress reenacted statutory language that had long existed,[2] thus signaling its intent to carry forward the body of case law that had developed under prior versions of the statute. Because there is nothing in the language of the 1952 Act, or its legislative history, to indicate that Congress intended to modify the rule against patenting business methods, we must presume that no change in the rule was intended. See, e.g., Astoria Fed. Sav. & Loan Ass’n v. Solimino, 501 U.S. 104, 108, 111 S.Ct. 2166, 115 L.Ed.2d 96 (1991) (“[W]here a common-law principle is well established ... the courts may take it as given that Congress has legislated with an expectation that the principle will apply except when a statutory purpose to the contrary is evident.”(citations and internal quotation marks omitted)); Isbrandtsen Co. v. Johnson, 343 U.S. 779, 783, 72 S.Ct. 1011, 96 L.Ed. 1294 (1952) (“Statutes which invade the common law ... are to be read with a presumption favoring the retention of long-established and familiar principles, except when a statutory purpose to the contrary is evident.”); see also In re Schrader, 22 F.3d 290, 295 (Fed.Cir.1994) (“When Congress approved the addition of the term ‘process’ to the categories of patentable subject matter in 1952, it incorporated the definition of ‘process’ that had evolved in the courts.”(footnote omitted)). If

[2] Congress did substitute the word “process” for “art” in the 1952 Act, but “[a]nalysis of the eligibility of a claim of patent protection for a ‘process’ did not change with the addition of that term to § 101.” Diamond v. Diehr, 450 U.S. 175, 184, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981).

Congress had wished to change the established practice of disallowing patents on business methods, it was quite capable of doing so explicitly. See Parker v. Flook, 437 U.S. 584, 596, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) (stressing that courts "must proceed cautiously when ... asked to extend patent rights into areas wholly unforeseen by Congress").

State Street's decision to jettison the prohibition against patenting methods of doing business contravenes congressional intent. Because (1) "the framers consciously acted to bar Congress from granting letters patent in particular types of business," Comiskey, 499 F.3d at 1375, and (2) Congress evidenced no intent to modify the long-established rule against business method patents when it enacted the 1952 Patent Act, it is hard to fathom how the issuance of patents on business methods can be supported.

II.

Business method patents have been justified, in significant measure, by a misapprehension of the legislative history of the 1952 Patent Act. In particular, proponents of such patents have asserted that the Act's legislative history states that Congress intended statutory subject matter to "include anything under the sun that is made by man." AT & T, 172 F.3d at 1355 (Fed.Cir.1999) (citations and internal quotation marks omitted); see also Diamond v. Chakrabarty, 447 U.S. 303, 309, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980). Read in context, however, the legislative history says no such thing. The full statement from the committee report reads: "A person may have 'invented' a machine or a manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable

under section 101 unless the conditions of the title are fulfilled." S.Rep. No.1979, 82d Cong., 2d Sess. 5 (1952), U.S.Code Cong. & Admin.News 1952, pp. 2394, 2399 (emphasis added); H.R.Rep. No.1923, 82d Cong., 2d Sess. 6 (1952) (emphasis added).

This statement does not support the contention that Congress intended "anything under the sun" to be patentable. To the contrary, the language supports the opposite view: a person may have "invented" anything under the sun, but it is "not necessarily patentable" unless the statutory requirements for patentability have been satisfied. Thus, the legislative history oft-cited to support business method patents undercuts, rather than supports, the notion that Congress intended to extend the scope of section 101 to encompass such methods.

Moreover, the cited legislative history is not discussing process claims at all. The quoted language is discussing "machines" and "manufactures;" it is therefore surprising that it has been thought a fit basis for allowing patents on business processes.

III.

The Constitution does not grant Congress unfettered authority to issue patents. See U.S. Const. art. I, § 8.[3] Instead, the patent power is a "qualified authority ... [which] is limited to the promotion of advances in the 'useful arts.'" Graham, 383 U.S. at 5,

[3] Article I, § 8 provides that "The Congress shall have Power ... To promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." The patent power "is the only one of the several powers conferred upon the Congress which is accompanied by a specific statement of the reason for it." Yuan, 188 F.2d at 380.

86 S.Ct. 684; see also KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 127 S.Ct. 1727, 1746, 167 L.Ed.2d 705 (2007) (reaffirming that patents are designed to promote "the progress of useful arts"). What the framers described as "useful arts," we in modern times call "technology." Paulik v. Rizkalla, 760 F.2d 1270, 1276 (Fed.Cir.1985) (en banc). Therefore, by mandating that patents advance the useful arts, "[t]he Constitution explicitly limited patentability to ... 'the process today called technological innovation.'" Comiskey, 499 F.3d at 1375 (quoting Paulik, 760 F.2d at 1276); see also In re Foster, 58 C.C.P.A. 1001, 438 F.2d 1011 (1971) ("All that is necessary ... to make a sequence of operational steps a statutory 'process' within 35 U.S.C. § 101 is that it be in the technological arts."); Karl B. Lutz, Patents and Science: A Clarification of the Patent Clause of the U.S. Constitution, 18 Geo. Wash. L.Rev. 50, 54 (1949) ("The term 'useful arts' as used in the Constitution ... is best represented in modern language by the word 'technology.'"); James S. Sfekas, Controlling Business Method Patents: How the Japanese Standard for Patenting Software Could Bring Reasonable Limitations to Business Method Patents in the United States, 16 Pac. Rim. L. & Pol'y J. 197, 214 (2007) (At the time the Patent Clause was adopted, "the term 'useful arts' was commonly used in contrast to the ideas of the 'liberal arts' and the 'fine arts,' which were well-known ideas in the eighteenth century.").

Before State Street led us down the wrong path, this court had rightly concluded that patents were designed to protect technological innovations, not ideas about the best way to run a business.[4] We had

[4] "[D]espite the assertions in State Street and Schrader, very few in the patent community believe that business methods

have always been patentable. To the contrary, the dominant view is that the law has changed, and that the definition of patentable subject matter is now wider than it once was." R. Carl Moy, Subjecting Rembrandt to the Rule of Law: Rule-Based Solutions for Determining the Patentability of Business Methods, 28 Wm. Mitchell L.Rev. 1047, 1060 (2002) (footnotes omitted); see also Rochelle Cooper Dreyfuss, Are Business Method Patents Bad for Business?, 16 Santa Clara Computer & High Tech. L.J. 263, 265-66 (2000) (State Street gave "judicial recognition to business method patents."). Over the course of two centuries, a few patents issued on what could arguably be deemed methods of doing business, see, e.g., U.S. Patent No. 5,664,115 ("Inter-active Computer System to Match Buyers and Sellers of Real Estate, Businesses and Other Property Using the Internet"), but these patents were aberrations and the general rule, prior to State Street, was that methods of engaging in business were ineligible for patent protection. See Comiskey, 499 F.3d at 1374 (noting that "[a]t one time, '[t]hough seemingly within the category of process or method, a method of doing business [was] rejected as not being within the statutory classes.'" (quoting State Street, 149 F.3d at 1377)). One commentator has noted that although the United States Patent and Trademark Office ("USPTO") "in an attempt to deflect criticism [has] issued an apologia ... asserting that business method patents are as old as the United States patent system," this document is fundamentally flawed. See Pollack, supra at 73-75. She explains:

> The USPTO wants us to believe that it found no records of patents whose points of invention were business methods, because no one had time to invent any new business methods until the human race had run its mechanical ingenuity to the peak of computer software; seemingly we were all too busy inventing the computer to think about anything else-especially new ways of doing business. I thought that we granted patents because, otherwise, people would be too busy making money by running businesses to take time out to invent anything except business methods. The USPTO [document], furthermore, is eliding the printed matter exception to patentable subject matter with the business method exception.

Id. at 75 (footnote omitted).

thus rejected as unpatentable a method for coordinating firefighting efforts, Patton, 127 F.2d at 326-27, a method for deciding how salesmen should best handle customers, In re Maucorps, 609 F.2d 481 (CCPA 1979), and a computerized method for aiding a neurologist in diagnosing patients, In re Meyer, 688 F.2d 789 (CCPA 1982).[5] We stated that patentable pro-cesses must "be in the technological arts so as to be in consonance with the Constitutional purpose to pro-mote the progress of 'useful arts.'" In re Musgrave, 57 C.C.P.A. 1352, 431 F.2d 882, 893 (CCPA 1970) (emphasis added).

Business method patents do not promote the "useful arts" because they are not directed to any technological or scientific innovation. Although business method applications may use technology—such as computers—to accomplish desired results, the innovative aspect of the claimed method is an entrepreneurial rather than a technological one. Thus, although Bilski's claimed hedging method could theoretically be implemented on a computer, that alone does not render it patentable. See Diehr, 450 U.S. at 192 n. 14, 101 S.Ct. 1048 (Patentability cannot be

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[5] The claims in Patton were explicitly rejected on the basis that they were directed to a business method, while the claims in Maucorps and Meyer were rejected as attempts to patent mathematical algorithms. Subsequently, however, this court stated that the claimed processes in Maucorps and Meyer were directed toward business systems and should therefore not be considered patent eligible. In re Alappat, 33 F.3d 1526, 1541 (Fed.Cir.1994) (en banc). We noted that " Maucorps dealt with a business methodology for deciding how salesmen should best handle respective customers and Meyer involved a 'system' for aiding a neurologist in diagnosing patients. Clearly, neither of the alleged 'inventions' in those cases falls within any § 101 category." Id.

established by the "token" use of technology.); Gottschalk v. Benson, 409 U.S. 63, 64-66, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972) (finding unpatentable a method of programming a general purpose digital computer to convert signals from binary-coded decimal to pure binary form). Where a claimed business method simply uses a known machine to do what it was designed to do, such as using a computer to gather data or perform calculations, use of that machine will not bring otherwise unpatentable subject matter within the ambit of section 101. See Benson, 409 U.S. at 67, 93 S.Ct. 253 (finding a process unpatentable where "[t]he mathematical procedures [could] be carried out in existing computers long in use, no new machinery being necessary").

Although the Supreme Court has not directly addressed the patentability of business methods, several of its decisions implicitly tether patentability to technological innovation. See Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 63, 119 S.Ct. 304, 142 L.Ed.2d 261 (1998) ("[T]he patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time."(emphasis added)); Markman v. Westview Instruments, Inc., 517 U.S. 370, 390, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996) ("Congress created the Court of Appeals for the Federal Circuit as an exclusive appellate court for patent cases ... observing that increased uniformity would strengthen the United States patent system in such a way as to foster technological growth and industrial innovation."(citations and internal quotation marks omitted) (emphasis added)); Benson, 409 U.S. at 71, 93 S.Ct. 253 (refusing to "freeze [the patentability of] process patents to old technologies,

leaving no room for the revelations of the new, onrushing technology " (emphases added)). Indeed, the Supreme Court has repeatedly emphasized that what renders subject matter patentable is "the application of the law of nature to a new and useful end." Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130, 68 S.Ct. 440, 92 L.Ed. 588 (1948); see Diehr, 450 U.S. at 188 n. 11, 101 S.Ct. 1048; Benson, 409 U.S. at 67, 93 S.Ct. 253.[6] Applying laws of nature to new and useful ends is nothing other than "technology."[7] See, e.g., Microsoft Computer Dictionary 513 (5th ed. 2002) (The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions."); American

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[6] Laws of nature are those laws pertaining to the "natural sciences," such as biology, chemistry, or physics. See, e.g., Webster's New International Dictionary 1507 (3d ed. 2002) ("Natural sciences" are the "branches of science ([such] as physics, chemistry, [or] biology) that deal with matter, energy, and their interrelations and transformations or with objectively measured phenomena."). They must be distinguished from other types of law, such as laws of economics or statutory enactments. Laws of nature do not involve "judgments on human conduct, ethics, morals, economics, politics, law, aesthetics, etc." Musgrave, 431 F.2d at 890; see also Joy Y. Xiang, How Wide Should the Gate of "Technology" Be? Patentability of Business Methods in China, 11 Pac. Rim L. & Pol'y J. 795, 807 (2002) (noting that State Street's" 'useful, concrete and tangible result' test is inconsistent with the 'application of the law of nature' patent eligibility scope outlined by the U.S. Supreme Court and [the Federal Circuit prior to State Street].").

[7] One commentator notes that both Japan and the Republic of Korea explicitly define an "invention" as the application of a law of nature, and argues that the United States should follow a similar approach to patentability. See Andrew A. Schwartz, The Patent Office Meets the Poison Pill: Why Legal Methods Cannot be Patented, 20 Harv. J. Law & Tech. 333, 357 (2007).

Heritage Dictionary of the English Language 1777 (4th ed. 2000) ("Technology" is the "application of science, especially to industrial or commercial objectives."); see also Sfekas, supra at 214-15 ("The [Supreme] Court's holdings in Benson and Diehr are really stating a requirement that inventions must be technological."); Schwartz, supra at 357 (The "clear and consistent body of Supreme Court case law establishes that the term 'invention' encompasses anything made by man that utilizes or harnesses one or more 'laws of nature' for human benefit."). As the Supreme Court has made clear, "the act of invention ... consists neither in finding out the laws of nature, nor in fruitful research as to the operation of natural laws, but in discovering how those laws may be utilized or applied for some beneficial purpose, by a process, a device or a machine." United States v. Dubilier Condenser Corp., 289 U.S. 178, 188, 53 S.Ct. 554, 77 L.Ed. 1114 (1933).

Methods of doing business do not apply "the law of nature to a new and useful end." Because the innovative aspect of such methods is an entrepreneurial rather than a technological one, they should be deemed ineligible for patent protection. See, e.g., John R. Thomas, The Patenting of the Liberal Professions, 40 B.C. L.Rev. 1139 (1999) (arguing that affording patentability to business methods opens the door to obtaining patent protection for all aspects of human thought and behavior, and that patents should remain grounded in science and technology) (hereinafter "Thomas (1999)"). "[T]he primary purpose of our patent laws is not the creation of private fortunes for the owners of patents but is 'to promote the progress of science and useful arts.'" Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502, 511, 37 S.Ct. 416, 61 L.Ed. 871 (1917).

Although business method patents may do much to enrich their owners, they do little to promote scientific research and technological innovation.

IV.

State Street has launched a legal tsunami, inundating the patent office with applications seeking protection for common business practices.[8] Applications for Class 705 (business method) patents increased from fewer than 1,000 applications in 1997 to more than 11,000 applications in 2007. See United States Patent and Trademark Office, Class 705 Application Filings and Patents Issued Data, available at http://www.uspto.gov/web/menu/pbmethod/applicationfiling.htm (information available as of Jan. 2008); see Douglas L. Price, Assessing the Patentability of Financial Services and Products, 3 J. High Tech. L. 141, 153 (2004) ("The State Street case has opened the floodgates on business method patents.").

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[8] Congress has acted to ameliorate some of the negative effects of granting patents on methods of doing business. It passed the American Inventors Protection Act (commonly referred to as the First Inventor Defense Act) which provides an affirmative defense against a business method patent infringement action if the defendant "acting in good faith, actually reduced the subject matter to practice at least 1 year before the effective filing date of such patent, and commercially used the subject matter before the effective filing date of such patent." See35 U.S.C. § 273. Even where a defendant may qualify for this defense, however, he "still must engage in expensive litigation where [he] bears the burden of affirmatively raising and proving the defense." See Nicholas A. Smith, Business Method Patents and Their Limits: Justifications, History, and the Emergence of A Claim Construction Jurisprudence, 9 Mich. Telecomm. & Tech. L.Rev. 171, 199 (2002).

Patents granted in the wake of State Street have ranged from the somewhat ridiculous to the truly absurd. See, e.g., U.S. Patent No. 5,851,117 (method of training janitors to dust and vacuum using video displays); U.S. Patent No. 5,862,223 (method for selling expert advice); U.S. Patent No. 6,014,643 (method for trading securities); U.S. Patent No. 6,119,099 (method of enticing customers to order additional food at a fast food restaurant); U.S. Patent No. 6,329,919 (system for toilet reservations); U.S. Patent No. 7,255,277 (method of using color-coded bracelets to designate dating status in order to limit "the embarrassment of rejection"). There has even been a patent issued on a method for obtaining a patent. See U.S. Patent No. 6,049,811. Not surprisingly, State Street and its progeny have generated a thundering chorus of criticism. See Leo J. Raskind, The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business, 10 Fordham Intell. Prop. Media & Ent. L.J. 61, 61 (1999) ("The Federal Circuit's recent endorsement of patent protection for methods of doing business marks so sweeping a departure from precedent as to invite a search for its justification."); Pollack, supra at 119-20 (arguing that State Street was based upon a misinterpretation of both the legislative history and the language of section 101 and that "business method patents are problematical both socially and constitutionally"); Price, supra at 155 ("The fall out from State Street has created a gold-rush mentality toward patents and litigation in which companies .... gobble up patents on anything and everything.... It is a mad rush to get as many dumb patents as possible."(citations and internal quotation marks omitted)); Thomas (1999), supra at 1160 ("After State Street, it is hardly an exaggeration

to say that if you can name it, you can claim it."); Sfekas, supra at 226 ("[T]he U.S. courts have set too broad a standard for patenting business methods.... These business method patents tend to be of lower quality and are unnecessary to achieve the goal of encouraging innovation in business."); William Krause, Sweeping the E-Commerce Patent Minefield: The Need for a Workable Business Method Exception, 24 Seattle U.L.Rev. 79, 101 (2000) (State Street "opened up a world of unlimited possession to anyone quick enough to take a business method and put it to use via computer software before anyone else."); Moy, supra at 1051 ("To call [the situation following State Street] distressing is an understatement. The consensus ... appears to be that patents should not be issuing for new business methods.").

There are a host of difficulties associated with allowing patents to issue on methods of conducting business. Not only do such patents tend to impede rather than promote innovation, they are frequently of poor quality. Most fundamentally, they raise significant First Amendment concerns by imposing broad restrictions on speech and the free flow of ideas.

A.

"[T]he underlying policy of the patent system [is] that 'the things which are worth to the public the embarrassment of an exclusive patent,'... must outweigh the restrictive effect of the limited patent monopoly." Graham, 383 U.S. at 10-11, 86 S.Ct. 684 (quoting letter from Thomas Jefferson to Isaac McPherson (Aug. 1813)). Thus, Congress may not expand the scope of "the patent monopoly without regard to the ... advancement or social benefit gained thereby." Id. at 6, 86 S.Ct. 684.

Patents should be granted to those inventions "which would not be disclosed or devised but for the inducement of a patent." Id. at 11, 86 S.Ct. 684. Methods of doing business have existed since the earliest days of the Patent Act and have flourished even in the absence of patent protection. See Brian P. Biddinger, Limiting the Business Method Patent: A Comparison and Proposed Alignment of European, Japanese and United States Patent Law, 69 Fordham L.Rev. 2523, 2544-50 (2001). Commentators have argued that "the broad grant of patent protection for methods of doing business is something of a square peg in a sinkhole of uncertain dimensions" since "[n]owhere in the substantial literature on innovation is there a statement that the United States economy suffers from a lack of innovation in methods of doing business." Raskind, supra at 92-93. Instead, "the long history of U.S. business is one of innovation, emulation, and innovation again. It also is a history of remarkable creativity and success, all without business method patents until the past few years." Smith, supra at 178; see also Sfekas, supra at 213 ("While innovation in business methods is a good thing, it is likely that there would be the same level of innovation even without patents on [such methods].").

Business innovations, by their very nature, provide a competitive advantage and thus generate their own incentives. See Xiang, supra at 813 ("A business entity improves the way it does business in order to be more effective and efficient, to stay ahead of [the] competition, and to make more profit."). The rapid "growth of fast food restaurants, self-service gasoline stations, quick oil change facilities ... automatic teller devices ... and alternatives for long-distance telephone services" casts real doubt about the need for

the additional incentive of patent protection in the commercial realm. Raskind, supra at 93.

Although patents are not a prerequisite to business innovation, they are of undeniable importance in promoting technological advances. For example, the pharmaceutical industry relies on patent protection in order to recoup the large sums it invests to develop life-saving and life-enhancing drugs:

> [T]he "fully loaded" cost of developing a single new pharmaceutical molecule, taking it though laboratory and clinical trials, and securing FDA approval for its marketing is today about $800 million (including the cost of project failures). Furthermore, fewer than one in five drug candidates that make it out of the laboratory survive this tortuous process and reach the marketplace in the form of FDA-approved pharmaceuticals.... Only patent protection can make the innovator's substantial investment in development and clinical testing economically rational.

Jay Dratler, Jr., Alice in Wonderland Meets the U.S. Patent System, 38 Akron L.Rev. 299, 313-14 (2005) (footnotes omitted).

Business method patents, unlike those granted for pharmaceuticals and other products, offer rewards that are grossly disproportionate to the costs of innovation. In contrast to technological endeavors, business innovations frequently involve little or no investment in research and development. Bilski, for example, likely spent only nominal sums to develop his hedging method. The reward he could reap if his application were allowed-exclusive rights over methods of managing risks in a wide array of commodity

transactions-vastly exceeds any costs he might have incurred in devising his "invention."

B.

"[S]ometimes too much patent protection can impede rather than 'promote the Progress of Science and useful Arts,' the constitutional objective of patent and copyright protection." Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc., 548 U.S. 124, 126, 126 S.Ct. 2921, 165 L.Ed.2d 399 (2006) (Breyer, J., joined by Stevens and Souter, JJ., dissenting from dismissal of writ of certiorari) (emphasis in original). This is particularly true in the context of patents on methods of conducting business. Instead of providing incentives to competitors to develop improved business techniques, business method patents remove building blocks of commercial innovation from the public domain. Dreyfuss, supra at 275-77. Because they restrict competitors from using and improving upon patented business methods, such patents stifle innovation. When "we grant rights to exclude unnecessarily, we ... limit competition with no quid pro quo. Retarding competition retards further development." Pollack, supra at 76. "Think how the airline industry might now be structured if the first company to offer frequent flyer miles had enjoyed the sole right to award them or how differently mergers and acquisitions would be financed ... if the use of junk bonds had been protected by a patent." Dreyfuss, supra at 264. By affording patent protection to business practices, "the government distorts the operation of the free market system and reduces the gains from the operation of the market." Sfekas, supra at 214.

It is often consumers who suffer when business methods are patented. See Raskind, supra at 82. Patented products are more expensive because licens-

ing fees are often passed on to consumers. See Lois Matelan, The Continuing Controversy Over Business Method Patents, 18 Fordham Intell. Prop. Med. & Ent. L.J. 189, 201 (2007). Further, as a general matter, "quantity and quality [of patented products] are less than they would be in a competitive market." Dreyfuss, supra at 275.

Patenting business methods makes American companies less competitive in the global marketplace. American companies can now obtain exclusionary rights on methods of conducting business, but their counterparts in Europe and Japan generally cannot. See Biddinger, supra at 2546-47. Producing products in the United States becomes more expensive because American companies, unlike their overseas counterparts, must incur licensing fees in order to use patented business methods:

> [O]nce a United States patent application for a new method of doing business becomes publicly available, companies in Europe and Japan may begin using the method outside the United States, while American companies in competition with the patentee would be unable to use the method in the United States without incurring licensing fees. The result is that companies outside of the United States receive the benefit of the novel method without incurring either the research and development costs of the inventor, or the licensing fees of the patentee's American competitors.

Id. at 2545-46.

C.

Another significant problem that plagues business method patents is that they tend to be of poor overall

quality. See eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 397, 126 S.Ct. 1837, 164 L.Ed.2d 641 (2006) (Kennedy, J., joined by Stevens, Souter, and Breyer, JJ., concurring) (noting the "potential vagueness and suspect validity" of some of "the burgeoning number of patents over business methods"). Commentators have lamented "the frequency with which the Patent Office issues patents on shockingly mundane business inventions." Dreyfuss, supra at 268; see also Pollack, supra at 106 ("[M]any of the recently-issued business method patents are facially (even farcically) obvious to persons outside the USPTO."). One reason for the poor quality of business method patents is the lack of readily accessible prior art references. Because business methods were not patentable prior to State Street, "there is very little patent-related prior art readily at hand to the examiner corps." Dreyfuss, supra at 269.

Furthermore, information about methods of conducting business, unlike information about technological endeavors, is often not documented or published in scholarly journals. See Russell A. Korn, Is Legislation the Answer? An Analysis of the Proposed Legislation for Business Method Patents, 29 Fla. St. U.L.Rev. 1367, 1372-73 (2002). The fact that examiners lack the resources to weed out undeserving applications "has led to the improper approval of a large number of patents, leaving private parties to clean up the mess through litigation." Krause, supra at 97.

Allowing patents to issue on business methods shifts critical resources away from promoting and protecting truly useful technological advances. As discussed previously, the patent office has been deluged with business method applications in recent

years. Time spent on such applications is time not spent on applications which claim true innovations. When already overburdened examiners are forced to devote significant time to reviewing large numbers of business method applications, the public's access to new and beneficial technologies is unjustifiably delayed.

D.

Patenting business methods allows private parties to claim exclusive ownership of ideas and practices which rightfully belong in the public domain. "It is a matter of public interest that [economic] decisions, in the aggregate, be intelligent and well informed. To this end, the free flow of commercial information is indispensable." Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council, Inc., 425 U.S. 748, 765, 96 S.Ct. 1817, 48 L.Ed.2d 346 (1976). Thus, "the stringent requirements for patent protection seek to assure that ideas in the public domain remain there for the free use of the public." Aronson v. Quick Point Pencil Co., 440 U.S. 257, 262, 99 S.Ct. 1096, 59 L.Ed.2d 296 (1979).

Bilski's claimed method consists essentially of two conversations. The first conversation is between a commodity provider and a commodity consumer, while the second conversation is between the provider and "market participants" who have "a counter-risk position to ... consumers." His claims provide almost no details as to the contents of these conversations.

Like many business method applications, Bilski's application is very broadly drafted. It covers a wide range of means for "hedging" in commodity transactions. If his application were allowed, anyone who

discussed ways to balance market risks in any sort of commodity could face potential infringement liability. By adopting overly expansive standards for patentability, the government enables private parties to impose broad and unwarranted burdens on speech and the free flow of ideas. See Thomas F. Cotter, A Burkean Perspective on Patent Eligibility, 22 Berkeley Tech. L.J. 855, 880-82 (2007) (arguing that overly expansive patent eligibility standards can result in the granting of patents that threaten free speech, privacy and other constitutionally-protected rights); John R. Thomas, The Future of Patent Law: Liberty and Property in the Patent Law, 39 Hous. L.Rev. 569, 589 (2002) (arguing that "the patent law allows private actors to impose more significant restraints on speech than has ever been possible through copyright"); see also Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n of New York, 447 U.S. 557, 569-70, 100 S.Ct. 2343, 65 L.Ed.2d 341 (1980) (The First Amendment mandates that restrictions on free speech in commercial transactions be "no more extensive than necessary.").

To the extent that business methods are deemed patentable, individuals can face unexpected potential infringement liability for everyday conversations and commercial interactions. "[I]mplicit in the Patent Clause itself [is the understanding] that free exploitation of ideas will be the rule, to which the pro-tection of a federal patent is the exception." Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 151, 109 S.Ct. 971, 103 L.Ed.2d 118 (1989). In the wake of State Street, too many patent holders have been allowed to claim exclusive ownership of subject matter that rightfully belongs in the public domain.

V.

The majority's proposed "machine-or-transformation test" for patentability will do little to stem the growth of patents on non-technological methods and ideas. Quite simply, in the context of business method patent applications, the majority's proposed standard can be too easily circumvented. See Cotter, supra at 875 (noting that the physical transformation test for patentability can be problematic because "[i]n a material universe, every process will cause some sort of physical transformation, if only at the microscopic level or within the human body, including the brain"). Through clever draftsmanship, nearly every process claim can be rewritten to include a physical transformation. Bilski, for example, could simply add a requirement that a commodity consumer install a meter to record commodity consumption. He could then argue that installation of this meter was a "physical transformation," sufficient to satisfy the majority's proposed patentability test.

Even as written, Bilski's claim arguably involves a physical transformation. Prior to utilizing Bilski's method, commodity providers and commodity consumers are not involved in transactions to buy and sell a commodity at a fixed rate. By using Bilski's claimed method, however, providers and consumers enter into a series of transactions allowing them to buy and sell a particular commodity at a particular price. Entering into a transaction is a physical process: telephone calls are made, meetings are held, and market participants must physically execute contracts. Market participants go from a state of not being in a commodity transaction to a state of being in such a transaction. The majority, however, fails to explain how this sort of physical transformation is

insufficient to satisfy its proposed patent eligibility standard.

The majority suggests that a technological arts test is nothing more that a "shortcut" for its machine-or-transformation test. Ante at 964. To the contrary, however, the two tests are fundamentally different. Consider U.S. Patent No. 7,261,652, which is directed to a method of putting a golf ball, U.S. Patent No. 6,368,227, which is directed to a method of swinging on a swing suspended on a tree branch, and U.S. Patent No. 5,443,036, which is directed to a method of "inducing cats to exercise." Each of these "inventions" involves a physical transformation that is central to the claimed method: the golfer's stroke is changed, a person on a swing starts swinging, and the sedentary cat becomes a fit feline. Thus, under the majority's approach, each of these inventions is patent eligible. Under a technological arts test, however, none of these inventions is eligible for patent protection because none involves any advance in science or technology.[9]

Regardless of whether a claimed process involves a "physical transformation," it should not be patent eligible unless it is directed to an advance in science or technology. See Benson, 409 U.S. at 64-71, 93 S.Ct. 253 (finding a process unpatentable even though it "transformed" binary-coded decimals into pure binary numbers using a general purpose computer). Although the Supreme Court has stated that a patentable process will usually involve a transforma-

[9] The majority's approach will encourage rent-seeking on a broad range of human thought and behavior. For example, because organizing a country into a democratic or socialist regime clearly involves a physical transformation, what is to prevent patents from issuing on forms of government?

tion of physical matter, see id. at 70, 93 S.Ct. 253, it has never found a process patent eligible which did not involve a scientific or technological innovation. See Diehr, 450 U.S. at 192-93, 101 S.Ct. 1048 (finding a process patentable where it involved new technology for curing rubber).

The majority refuses to inject a technology requirement into the section 101 analysis because it believes that the terms "technological arts" and "technology" are "ambiguous." See ante at 960. To the contrary, however, the meaning of these terms is not particularly difficult to grasp. "The need to apply some sort of 'technological arts' criterion has hardly led other countries' and regions' patent systems to grind to a halt; it is hard to see why it should be an insurmountable obstacle for ours." Cotter, supra at 885. As discussed more fully in section III, a claimed process is technological to the extent it applies laws of nature to new ends. See Benson, 409 U.S. at 67, 93 S.Ct. 253 ("'If there is to be invention from ... a discovery, it must come from the application of the law of nature to a new and useful end.'" (quoting Funk Bros., 333 U.S. at 130, 68 S.Ct. 440)). By contrast, a process is non-technological where its inventive concept is the application of principles drawn not from the natural sciences but from disciplines such as business, law, sociology, or psychology. See Thomas (1999), supra at 1168 ("[F]ew of us would suppose that inventions within the domain of business, law or fine arts constitute technology, much less patentable technology."). The inventive aspect of Bilski's claimed process is the application of business principles, not laws of nature; it is therefore non-technological and ineligible for patent protection.

Unlike a technological standard for patentability, the majority's proposed test will be exceedingly difficult to apply. The standard that the majority proposes for inclusion in the patentability lexicon-"transformation of any physical object or substance, or an electronic signal representative of any physical object or substance," ante at 964—is unnecessarily complex and will only lead to further uncertainty regarding the scope of patentable subject matter. As noted in In re Nuijten, 500 F.3d 1346, 1353 (Fed.Cir.2007), defining the term "physical" can be an "esoteric and metaphysical" inquiry. Indeed, although this court has struggled for years to set out what constitutes sufficient physical transformation to render a process patentable, we have yet to provide a consistent or satisfactory resolution of this issue.

We took this case en banc in a long-overdue effort to resolve primal questions on the metes and bounds of statutory subject matter. The patent system has run amok, and the USPTO, as well as the larger patent community, has actively sought guidance from this court in making sense of our section 101 jurisprudence. See Supplemental Br. of Appellee at 3 ("[The Federal Circuit] should clarify the meaning of State Street and AT & T, as they have been too often misunderstood."); Br. of Fin. Serv. Indus. at 1 ("The rise of [business method patents] in recent years has ... led to uncertainty over the scope of the patents granted and, more fundamentally, the definition of patentable subject matter itself. [We] seek a workable standard defining the scope of patentable subject matter, one that ... provides clear guidance to the Patent and Trademark Office ... and the public."); Br. of Samuelson Law, Tech. and Public Policy Clinic at 1 ("Ever since State Street, the [USPTO] has been flooded with applications for a wide variety of non-

technological 'inventions' such as arbitration methods, dating methods, tax-planning methods, legal methods, and novel-writing methods. These applications have eroded public confidence in the patent system and driven up the cost and decreased the return for applicants seeking legitimate technological patents."(footnote omitted)); Br. of Assoc. of Am. Medical Colleges at 29 (arguing that "broad swaths of the public and certain industry sectors" have lost respect for the patent system and that "[the Federal Circuit] should act, even if its actions mean unsettling the settled expectations of some"). The majority, however, fails to enlighten three of the thorniest issues in the patentability thicket: (1) the continued viability of business method patents, (2) what constitutes sufficient physical transformation or machine-implementation to render a process patentable, and (3) the extent to which computer software and computer-implemented processes constitute statutory subject matter. The majority's "measured approach" to the section 101 analysis, see ante at 962, will do little to restore public confidence in the patent system or stem the growth of patents on business methods and other non-technological ideas.

VI.

Where the advance over the prior art on which the applicant relies to make his invention patentable is an advance in a field of endeavor such as law (like the arbitration method in Comiskey), business (like the method claimed by Bilski) or other liberal—as opposed to technological-arts, the application falls outside the ambit of patentable subject matter. The time is ripe to repudiate State Street and to recalibrate the standards for patent eligibility, thereby ensuring that the patent system can fulfill its con-

stitutional mandate to protect and promote truly useful innovations in science and technology. I dissent from the majority's failure to do so.

RADER, Circuit Judge, dissenting.

This court labors for page after page, paragraph after paragraph, explanation after explanation to say what could have been said in a single sentence: "Because Bilski claims merely an abstract idea, this court affirms the Board's rejection." If the only problem of this vast judicial tome were its circuitous path, I would not dissent, but this venture also disrupts settled and wise principles of law.

Much of the court's difficulty lies in its reliance on dicta taken out of context from numerous Supreme Court opinions dealing with the technology of the past. In other words, as innovators seek the path to the next tech no-revolution, this court ties our patent system to dicta from an industrial age decades removed from the bleeding edge. A direct reading of the Supreme Court's principles and cases on patent eligibility would yield the one-sentence resolution suggested above. Because this court, however, links patent eligibility to the age of iron and steel at a time of subatomic particles and terabytes, I must respectfully dissent.

I

The Patent Law of the United States has always embodied the philosophy that "ingenuity should receive a liberal encouragement." Writings of Thomas Jefferson 75-76 (Washington ed. 1871); see also Diamond v. Chakrabarty, 447 U.S. 303, 308-09, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980). True to this principle, the original Act made "any new and useful art, machine, manufacture or composition of matter" patent eligible. Act of Feb. 21, 1793, ch. 11, § 1, 1 Stat. 318 (emphasis supplied). Even as the laws have evolved, that bedrock principle remains at their

foundation. Thus, the Patent Act from its inception focused patentability on the specific characteristics of the claimed invention-its novelty and utility-not on its particular subject matter category.

The modern incarnation of section 101 holds fast to that principle, setting forth the broad categories of patent eligible subject matter, and conditioning patentability on the characteristics, not the category, of the claimed invention:

> 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 conditions and requirements of this title.

35 U.S.C. § 101 (2006) (emphases supplied). As I have suggested, the Supreme Court requires this court to rely on the "ordinary, contemporary, common meaning" of these words. Diamond v. Diehr, 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981). If this court would follow that Supreme Court rule, it would afford broad patent protection to new and useful inventions that fall within the enumerated categories and satisfy the other conditions of patentability. That is, after all, precisely what the statute says.

In Diehr, the Supreme Court adopted a very useful algorithm for determining patentable subject matter, namely, follow the Patent Act itself. After setting forth the procedural history of that case, the Supreme Court stated: "In cases of statutory construction, we begin with the language of the statute." Diehr, 450 U.S. at 182, 101 S.Ct. 1048.With an eye to the Benson language (so central to this court's reasoning) that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the

patentability of a process claim that does not include particular machines," Gottschalk v. Benson, 409 U.S. 63, 72, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972), the Court then noted:

> [I]n dealing with the patent laws, we have 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, 101 S.Ct. 1048 (citations omitted). Indeed section 101's term "process" contains no hint of an exclusion for certain types of methods. This court today nonetheless holds that a process is eligible only if it falls within certain subsets of "process." Ironically the Patent Act itself specifically defines "process" without any of these judicial innovations. 35 U.S.C. § 100(b). Therefore, as Diehr commands, this court should refrain from creating new circuitous judge-made tests.

Read in context, section 101 gives further reasons for interpretation without innovation. Specifically, section 101 itself distinguishes patent eligibility from the conditions of patentability-providing generously for patent eligibility, but noting that patentability requires substantially more. The language sweeps in "any new and useful process ... [and] any improvement." 35 U.S.C. § 101 (emphasis supplied). As an expansive modifier, "any" embraces the broad and ordinary meanings of the term "process," for instance. The language of section 101 conveys no implication that the Act extends patent protection to some subcategories of processes but not others. It does not mean "some" or even "most," but all.

Unlike the laws of other nations that include broad exclusions to eligible subject matter, such as Euro-

pean restrictions on software and other method patents, see European Patent Convention of 1973, Art. 52(2)(c) and (3), and prohibitions against patents deemed contrary to the public morality, see id. at Art. 53(a), U.S. law and policy have embraced advances without regard to their subject matter. That promise of protection, in turn, fuels the research that, at least for now, makes this nation the world's innovation leader.

II

With all of its legal sophistry, the court's new test for eligibility today does not answer the most fundamental question of all: why would the expansive language of section 101 preclude protection of innovation simply because it is not transformational or properly linked to a machine (whatever that means)? Stated even more simply, why should some categories of invention deserve no protection?

This court, which reads the fine print of Supreme Court decisions from the Industrial Age with admirable precision, misses the real import of those decisions. The Supreme Court has answered the fundamental question above many times. The Supreme Court has counseled that the only limits on eligibility are inventions that embrace natural laws, natural phenomena, and abstract ideas. See, e.g., Diehr, 450 U.S. at 185, 101 S.Ct. 1048 ("This Court has undoubtedly recognized limits to § 101 and every discovery is not embraced within the statutory terms. Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas."). In Diehr, the Supreme Court's last pronouncement on eligibility for "processes," the Court said directly that its only exclusions from the statutory language are these three common law exclusions: "Our recent hold-

ings ... stand for no more than these long-established principles." Id. at 185, 101 S.Ct. 1048.

This point deserves repetition. The Supreme Court stated that all of the transformation and machine linkage explanations simply restated the abstractness rule. In reading Diehr to suggest a non-statutory transformation or preemption test, this court ignores the Court's admonition that all of its recent holdings do no more than restate the natural laws and abstractness exclusions. Id.; see also Chakrabarty, 447 U.S. at 310, 100 S.Ct. 2204 ("Here, by contrast, the patentee has produced a new bacterium with markedly different characteristics from any found in nature and one having the potential for significant utility. His discovery is not nature's handiwork, but his own; accordingly it is patentable subject matter under § 101."); Parker v. Flook, 437 U.S. 584, 591-594, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) ("Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application."); In re Taner, 681 F.2d 787, 791 (C.C.P.A 1982) ("In Diehr, the Supreme Court made clear that Benson stands for no more than the long-established principle that laws of nature, natural phenomena, and abstract ideas are excluded from patent protection.").

The abstractness and natural law preclusions not only make sense, they explain the purpose of the expansive language of section 101. Natural laws and phenomena can never qualify for patent protection because they cannot be invented at all. After all, God or Allah or Jahveh or Vishnu or the Great Spirit

provided these laws and phenomena as humanity's common heritage. Furthermore, abstract ideas can never qualify for patent protection because the Act intends, as section 101 explains, to provide "useful" technology. An abstract idea must be applied to (transformed into) a practical use before it qualifies for protection. The fine print of Supreme Court opinions conveys nothing more than these basic principles. Yet this court expands (transforms?) some Supreme Court language into rules that defy the Supreme Court's own rule.

When considering the eligibility of "processes," this court should focus on the potential for an abstract claim. Such an abstract claim would appear in a form that is not even susceptible to examination against prior art under the traditional tests for patentability. Thus this court would wish to ensure that the claim supplied some concrete, tangible technology for examination. Indeed the hedging claim at stake in this appeal is a classic example of abstractness. Bilski's method for hedging risk in commodities trading is either a vague economic concept or obvious on its face. Hedging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class. In any event, this facially abstract claim does not warrant the creation of new eligibility exclusions.

III

This court's willingness to venture away from the statute follows on the heels of an oft-discussed dissent from the Supreme Court's dismissal of its grant of certiorari in Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc., 548 U.S. 124, 126 S.Ct. 2921, 165 L.Ed.2d 399 (2006). That dissent is premised on a fundamental misapprehension of the distinction

between a natural phenomenon and a patentable process.

The distinction between "phenomena of nature," "mental processes," and "abstract intellectual concepts" is not difficult to draw. The fundamental error in that Lab. Corp. dissent is its failure to recognize the difference between a patent ineligible relationship—i.e., that between high homocysteine levels and folate and cobalamin deficiencies—and a patent eligible process for applying that relationship to achieve a useful, tangible, and concrete result—i.e., diagnosis of potentially fatal conditions in patients. Nothing abstract here. Moreover, testing blood for a dangerous condition is not a natural phenomenon, but a human invention.

The distinction is simple but critical: A patient may suffer from the unpatentable phenomenon of nature, namely high homocysteine levels and low folate. But the invention does not attempt to claim that natural phenomenon. Instead the patent claims a process for assaying a patient's blood and then analyzing the results with a new process that detects the life-threatening condition. Moreover, the sick patient does not practice the patented invention. Instead the patent covers a process for testing blood that produces a useful, concrete, and tangible result: incontrovertible diagnostic evidence to save lives. The patent does not claim the patent ineligible relationship between folate and homocysteine, nor does it foreclose future inventors from using that relationship to devise better or different processes. Contrary to the language of the dissent, it is the sick patient who "embod[ies] only the correlation between homocysteine and vitamin deficiency," Lab. Corp., 548 U.S. at 137, 126 S.Ct. 2921, not the claimed process.

From the standpoint of policy, the Lab. Corp. dissent avoids the same fundamental question that the Federal Circuit does not ask or answer today: Is this entire field of subject matter undeserving of incentives for invention? If so, why? In the context of Lab. Corp. that question is very telling: the natural condition diagnosed by the invention is debilitating and even deadly. See U.S. Patent No. 4,940,658, col. 1, ll. 32-40 ("Accurate and early diagnosis of cobalamin and folate deficiencies... is important because these deficiencies can lead to life-threatening hematologic abnormalities.... Accurate and early diagnosis of cobalamin deficiency is especially important because it can also lead to incapacitating and life-threatening neuropsychiatric abnormalities."). Before the invention featured in Lab. Corp., medical science lacked an affordable, reliable, and fast means to detect this debilitating condition. Denial of patent protection for this innovation-precisely because of its elegance and simplicity (the chief aims of all good science)—would undermine and discourage future research for diagnostic tools. Put another way, does not Patent Law wish to encourage researchers to find simple blood tests or urine tests that predict and diagnose breast cancers or immunodeficiency diseases? In that context, this court might profitably ask whether its decisions incentivize research for cures and other important technical advances. Without such attention, this court inadvertently advises investors that they should divert their unprotectable investments away from discovery of "scientific relationships" within the body that diagnose breast cancer or Lou Gehrig's disease or Parkinson's or whatever.

IV

In sum, this court today invents several circuitous and unnecessary tests. It should have merely noted that Bilski attempts to patent an abstract idea. Nothing more was needed. Instead this opinion propagates unanswerable questions: What form or amount of "transformation" suffices? When is a "representative" of a physical object sufficiently linked to that object to satisfy the transformation test? (e.g., Does only vital sign data taken directly from a patient qualify, or can population data derived in part from statistics and extrapolation be used?) What link to a machine is sufficient to invoke the "or machine" prong? Are the "specific" machines of Benson required, or can a general purpose computer qualify? What constitutes "extra-solution activity?" If a process may meet eligibility muster as a "machine," why does the Act "require" a machine link for a "process" to show eligibility? Does the rule against redundancy itself suggest an inadequacy in this complex spider web of tests supposedly "required" by the language of section 101?

One final point, reading section 101 as it is written will not permit a flurry of frivolous and useless inventions. Even beyond the exclusion for abstractness, the final clause of section 101—"subject to the conditions and requirements of this title"—ensures that a claimed invention must still satisfy the "conditions and requirements" set forth in the remainder title 35. Id. These statutory conditions and requirements better serve the function of screening out unpatentable inventions than some vague "transformation" or "proper machine link" test.

In simple terms, the statute does not mention "transformations" or any of the other Industrial Age

descriptions of subject matter categories that this court endows with inordinate importance today. The Act has not empowered the courts to impose limitations on patent eligible subject matter beyond the broad and ordinary meaning of the terms process, machine, manufacture, and composition of matter. It has instead preserved the promise of patent protection for still unknown fields of invention.

Innovation has moved beyond the brick and mortar world. Even this court's test, with its caveats and winding explanations seems to recognize this. Today's software transforms our lives without physical anchors. This court's test not only risks hobbling these advances, but precluding patent protection for tomorrow's technologies. "We still do not know one thousandth of one percent of what nature has revealed to us." Attributed to Albert Einstein. If this court has its way, the Patent Act may not incentivize, but complicate, our search for the vast secrets of nature. When all else fails, consult the statute.

APPENDIX B

UNITED STATES COURT OF APPEALS,
FEDERAL CIRCUIT.

No. 2007-1130.

IN RE: BERNARD L. BILSKI AND RAND A. WARSAW.

Feb. 15, 2008.

ORDER

Before MICHEL, *Chief Judge*, NEWMAN, MAYER, LOURIE, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, PROST, and MOORE, *Circuit Judges*.

PER CURIAM.

This case was argued before a panel of this court on October 1, 2007. Thereafter, a poll of the judges in regular active service was conducted to determine whether the appeal should be heard en banc.

Upon consideration thereof, IT IS ORDERED THAT:

> The court by its own action grants a hearing en banc. The parties are requested to file supplemental briefs that should address the following questions:
>
> (1) Whether claim 1 of the 08/833,892 patent application claims patent-eligible subject matter under 35 U.S.C. § 101?
>
> (2) What standard should govern in determining whether a process is patent-eligible subject matter under section 101?

(3) Whether the claimed subject matter is not patent-eligible because it constitutes an abstract idea or mental process; when does a claim that contains both mental and physical steps create patent-eligible subject matter?

(4) Whether a method or process must result in a physical transformation of an article or be tied to a machine to be patent-eligible subject matter under section 101?

(5) Whether it is appropriate to reconsider *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed.Cir. 1998), and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed.Cir.1999), in this case and, if so, whether those cases should be overruled in any respect?

This appeal will be heard en banc on the basis of the original briefs and supplemental briefs addressing, inter alia, the issues set forth above. An original and thirty copies of all briefs shall be filed, and two copies served on opposing counsel. The parties shall file simultaneous supplemental briefs which are due in the court within 20 days from the date of filing of this order, *i.e.*, on March 6, 2008. No further briefing will be entertained. Supplemental briefs shall adhere to the type-volume limitations for principal briefs set forth in Federal Rule of Appellate Procedure 32 and Federal Circuit Rule 32.

Any amicus briefs will be due 30 days thereafter. Any such briefs may be filed without leave of court but otherwise must comply with Federal Rule of Appellate Procedure 29 and Federal Circuit Rule 29. Oral argument will be held on Thursday, May 8 at 2:00 p.m. in Courtroom 201.

APPENDIX C

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

BOARD OF PATENT APPEALS AND INTERFERENCES INFORMATIVE OPINION

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

EX PARTE BERNARD L. BILSKI AND RAND A. WARSAW

Appeal No. 2002-2257
Application 08/833,892[1]

HEARD: MARCH 8, 2006 [2]
MAILED: SEPTEMBER 26, 2006

Before FRANKFORT, McQUADE, BARRETT, BAHR, and NAGUMO, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-11.

We affirm.

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[1] Application for patent filed April 10, 1997, entitled "Energy Risk Management Method," which claims the priority benefit under 35 U.S.C. § 119(e) of Provisional Application 60/015,756, filed April 16, 1996.

[2] The case was previously heard on April 3, 2003, by Administrative Patent Judges Barrett, Fleming, and Nagumo, but no decision was entered.

BACKGROUND

The invention relates to a method practiced by a commodity provider for managing (i.e., hedging) the consumption risks associated with a commodity sold at a fixed price. It is disclosed that energy consumers face two kinds of risk: price risk and consumption risk (specification, p. 1). The proliferation of price risk management tools over the last 5 years before the filing date allows easy management of price risk (specification, p. 2). However, consumption risk (e.g., the need to use more or less energy than planned due to the weather) is said to be not currently managed in energy markets, which is the problem addressed by the invention (specification, p. 2).

Claim 1 is reproduced below.

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

(b) identifying market participants for said commodity having a counter-risk position to said consumers; and

(c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

THE REJECTION

No references are applied in the rejection.

Claims 1-11 stand rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter.

Pages of the final rejection (Paper No. 15) are referred to as "FR__." Pages of the examiner's answer (Paper No. 18) are referred to as "EA__" Pages of the appeal brief (Paper No. 17) are referred to as "Br__" Pages of the reply brief (Paper No. 19) are referred to as "RBr__"

The examiner's position is summarized in the statement that, "[r]egarding [] claims 1-11, the invention is not implemented on a specific apparatus and merely manipulates [an] abstract idea and solves a purely mathematical problem without any limitation to a practical application, therefore, the invention is not directed to the technological arts" (FR4). That is, the examiner states that the invention is an "abstract idea," and apparently a "mathematical algorithm," and does not fall within the "technological arts" according to In re Musgrave, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970), where the examiner states (FR4): "The definition of 'technology' is the 'application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least improve human efficiency in some respect.' (Computer Dictionary 384 (Microsoft Press, 2d ed. 1994))." The examiner finds that no specific apparatus is disclosed to perform the steps, so "claims 1-11 are intended to be directed to the abstract method apart from the apparatus for performing the method" (FR4) and "[t]herefore, the claims are non-statutory, because they are directed solely to an abstract idea

and solve[] a purely mathematical problem without practical application in the technological arts" (FR4). Therefore, the final rejection relies on both the "abstract ideal" exclusion and a "technological arts" test for statutory subject matter.

In the examiner's answer, it is stated that "Applicant['s admission] that the steps of the method need not be performed on a computer (Appeal Brief at page 6) coupled with no disclosure of a computer or any other means to carry out the invention, make it clear that the invention is not in the technological arts" (EA4). The examiner states that the disclosure does not describe an implementation in the technological arts. The examiner states that the only way to perform the steps without a computer is by human means, and, therefore, the method is not technological because it does not "improve human efficiency" as required by the definition of "technology" (EA5-6). Thus, the examiner's answer relies primarily on a "technological arts" test.

DISCUSSION

The issue

The issue is whether the subject matter of claims 1-11 is directed to a statutory "process" under 35 U.S.C. § 101. We conclude that it is not.

Equally important is what test(s) should be applied in determining statutory subject matter.

Non-machine-implemented methods

The "useful arts" in the Constitution, are implemented by Congress in the statutory categories of eligible subject matter in 35 U.S.C. § 101: "process, machine, manufacture, or composition of matter, or any new and useful improvements thereof." Machines,

manufactures, and man-made compositions of matter represent tangible physical things invented by man and seldom raise a § 101 issue, except for the "special case" of claims to general purpose machines (usually computers) that merely perform abstract ideas (*e.g.*, mathematical algorithms), where the fact that the claim is nominally directed to a "machine" under, § 101 does not preclude it from being held nonstatutory. Machine-implemented methods also seldom have a problem being considered a process under § 101 because a "process" includes a new use for a known machine, § 100 (b), again except for the "special case" of machine-implemented abstract ideas. However, "non-machine-implemented" methods, because of their abstract nature, present § 101 issues.

This appeal involves "non-machine-implemented" method claims, i.e., the claims do not recite how the steps are implemented and are broad enough to read on performing the steps without any machine or apparatus (although performing the steps on a machine would, of course, infringe). The steps of claim 1: do not recite any specific way of implementing the steps; do not expressly or impliedly recite any physical transformation of physical subject matter, tangible or intangible, from one state into another; do not recite any electrical, chemical, or mechanical acts or results; do not directly or indirectly recite transforming data by a mathematical or non-mathematical algorithm; are not required to be performed on a machine, such as a computer, either as claimed or disclosed; could be performed entirely by human beings; and do not involve making or using a machine, manufacture, or composition of matter. We do not believe the outcome in this case is controlled by the Federal Circuit decisions in State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F. 3d 1368, 47

USPQ2d 1596 (Fed. Cir. 1998) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999) because we interpret those cases to involve the "special case" of transformation of data by a machine.

The question of whether this type of non-machine-implemented subject matter is patentable is a common and important one to the U.S. Patent and Trademark Office (USPTO), as the bounds of patentable subject matter are increasingly being tested. In recent years, the USPTO has been flooded with claims to "processes," many of which bear scant resemblance to classical processes of manipulating or transforming compositions of matter or forms of energy from one state to another. Many of these applications are referred to as so-called "business methods," but claims to methods of meditation, dating, physical sports moves, etc., are also presented. "Business methods" have long been considered statutory subject matter when performed by a machine. Technology Center 3600, Workgroup 3620, in the USPTO is entirely dedicated to "Electronic Commerce (Business Methods)" in Class 705, "Data Processing: Financial, Business Practice, Management, or Cost/Price Determination"; see http://www.uspto.gov /web/menu/pbmethod. The USPTO no longer rejects claims because the claimed subject matter does "business" instead of something else. See State Street, 149 F.3d at 1377, 47 USPQ2d at 1600 (referring to Examination Guidelines, 61 Fed. Reg. 7478, 7479 (1996)). Nevertheless, many questions remain about statutory subject matter and what the tests are for determining statutory subject matter. State Street and AT&T, often called "revolutionary," involved patented machines or machine-implemented processes that examiners have for sometime regarded as

nonexceptional. Perhaps encouraged by certain general language in these cases, however, a wide range of ever more general claims to "processes" come before the Office (although the present case predates both State Street and AT&T). Many, like the claimed process in the present case, are not limited to implementation via any particular technology or machine. Are such "processes" patentable because they are "useful"? Other "process claims" involve what seem to be insubstantial or incidental manipulations of physical subject matter—e.g., the mere recording of a datum: are these patentable processes? Still other process claims involve human physical activity—methods of throwing a ball or causing a fumble. Do these process claims cover patentable subject matter? Must the examiners analyze such claims for compliance with the written description and enablement requirements, and search the prior art for evidence of novelty and nonobviousness?

Given the difficulty for examiners to make § 101 rejections, and the clear disfavor for such rejections in the opinions of our reviewing court, the U.S. Court of Appeals for the Federal Circuit, and in the view of many patent practitioners, it would be much more administratively convenient if the USPTO did not have to examine claims for statutory subject matter under §101. Nevertheless, it is the USPTO's duty to examine claims for compliance with § 101 as well as the other statutory requirements of patentability. See Graham v. John Deere Co., 383 U.S. 1, 18, 148 USPQ 459, 467 (1966) ("[T]he primary responsibility for sifting out unpatentable material lies in the Patent Office. To await litigation is—for all practical purposes—to debilitate the patent system."). The USPTO rejects cases based on its understanding of § 101, not because it may be difficult to find prior art or to

examine the claims for novelty and unobviousness. Cf. In re Fisher, 421 F.3d 1365, 1378, 76 USPQ2d 1225, 1235 (Fed. Cir. 2005) ("The concerns of the government and amici [that allowing EST patents would discourage research, delay scientific discovery, and thwart progress in the 'useful Arts'], which may or may not be valid, are not ones that should be considered in deciding whether the application for the claimed ESTs meets the utility requirement of § 101. The same may be said for the resource and managerial problems that the PTO potentially would face if applicants present the PTO with an onslaught of patent applications directed to particular ESTs. Congress did not intend for these practical implications to affect the determination of whether an invention satisfies the requirements set forth in 35 U.S.C. §§ 101, 102, 103, and 112."). In questionable cases, we feel that the public interest is best served by making a rejection. The Federal Circuit cannot address rejections that it does not see. See Enzo Biochem, Inc. v. Gen-Probe Inc., 323 F.3d 956, 972, 63 USPQ2d 1609, 1619 (Fed. Cir. 2002) (Lourie, *J*., concurring in decision not to hear the case en banc) ("As for the lack of earlier cases on this issue, it regularly happens in adjudication that issues do not arise until counsel raise them, and, when that occurs, courts are then required to decide them.").

Only a very small fraction of the cases examined by the Examining Corps are ever appealed to the Board of Patent Appeals and Interferences (Board), and only a very small fraction of the rejections affirmed by the Board will ever be appealed to the Federal Circuit. The fact that not many § 101 cases get appealed should not be interpreted to mean that these are an insignificant problem to the USPTO and the public. As indicated by Justice Breyer dissenting

from the dismissal of certiorari in Laboratory Corp. of America Holdings v. Metabolite Labs., Inc., 126 S. Ct. 2921, 79 USPQ2d 1065 (2006) (Labcorp), there are still unresolved issues under § 101.

Legal analysis of statutory subject matter

Several major analyses of statutory subject matter have been published recently. We review two in detail in the following summary.

Ex parte Lundgren

To avoid repetition, this opinion expressly incorporates by reference the legal analysis of statutory subject matter in the concurring-in-part/dissenting-in-part opinion of Administrative Patent Judge Barrett in Ex parte Lundgren, 76 USPQ2d 1385, 1393-1429 (Bd. Pat. App. & Int. 2005) (precedential). That discussion tries to identify the questions that have not been answered in the analysis of patentable subject matter under § 101 and to identify existing tests for statutory subject matter, rather than create some new test. The USPTO is struggling to identify some way to objectively analyze the statutory subject matter issue instead of just saying "We know it when we see it."

The main points of Lundgren are summarized as follows:[3]

(1) The Constitution authorizes Congress "To promote the Progress of . . . useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries." U.S. Const., art. I, § 8, cl. 8. There is little evidence in the historical record about

[3] It should be understood that the citations to Lundgren are to the discussion and cases cited: the remarks of the concurrence/dissent have only persuasive value.

what is meant by the "useful arts," but it appears intended to refer to "arts" used in industry and the production of goods. See Alan L. Durham, "Useful Arts" in the Information Age, 1999 BYU L. Rev. 1419 (1999).

(2) "Technological arts" is the modern equivalent of "useful arts" in the Constitution. Lundgren, 76 USPQ2d at 1393-94.

(3) "Technology" is defined as the totality of means employed to provide objects necessary for human sustenance and comfort. Id. at 1394. The definition of "engineering" as "the application of science and mathematics by which the properties of matter and the sources of energy in nature are made useful to man in structures, machines, products, systems, and processes" (emphasis added) is considered a good description of "technology" and the "useful arts." Id.

(4) The "useful arts" provision in the Constitution is implemented by Congress in the statutory categories of eligible subject matter in 35 U.S.C. § 101: "process, machine, manufacture, or composition of matter, or any new and useful improvements thereof." Id. at 1396-97. The "utility" requirement of § 101 is separate from the eligible subject matter requirement. Id. at 1396.[4]

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[4] The Constitution authorizes Congress "To promote the Progress of . . . useful Arts." This provision can be mapped onto the statutory provisions as follows: "Arts" corresponds to the eligible statutory subject matter classes of "process, machine, manufacture, or composition of matter" in § 101 ("art" in the statute before 1952 had a different meaning than "useful arts" in the Constitution and was interpreted as practically synonymous with process or method, S. Rep. No. 1979, reprinted in 1952 U.S. Code Cong. & Admin. News at 2398); in the Constitution corresponds to the "useful" (utility) requirement in §101;

(5) The terms "invents" and "discovers" in § 101 are interpreted to require "invention," which is the conception and production of something that did not before exist, as opposed to "discovery," which is to bring to light that which existed before, but which was not known. Id. Of course, the practical application of a discovery of a law of nature may be patentable.

(6) The oft-quoted statement that "Congress intended statutory subject matter to 'include anything under the sun that is made by man'" Diamond v. Diehr, 450 U.S. 175, 182, 209 USPQ 1, 6 (1981), quotes from S. Rep. No. 1979, reprinted in 1952 U.S. Code Cong. & Admin. News at 2399:

> A person may have "invented" a machine or manufacture, which may include anything under the sun made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.

This sentence does not mention a "process" or a "composition of matter."[5] A "manufacture" has long

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"progress" in the Constitution corresponds to the "new" requirement in §101 which is defined in the conditions of novelty under § 102 and nonobviousness under § 103. The utility requirement is separate from the eligible subject matter requirement in § 101. See, eg., Fisher, 421 F.3d at 1378, 76 USPQ2d at 1236 (expressed sequence tag (EST) is a composition of matter that does not meet utility requirement of §101).

[5] As discussed by Justice Breyer at the oral argument in Labcorp (transcript on "http://www.supremecourtus.gov/oral_arguments/argument_transcripts.htm1," Argument 04-607, argued 3/21/06, p. 43, line 16, to p. 44, line 4):

> JUSTICE BREYER: Does that fall within it? I mean, I can't resist pointing, as one of these briefs did, the phrase anything under the sun that is made by man comes from a

been defined to be "anything made 'by hands of man' from raw materials, whether literally by hand or by machinery or by art." In re Hruby, 373 F.2d 997, 1000, 153 USPQ 61, 65 (CCPA 1967), discussing Riter- Conley Mfg. Co. v. Aiken, 203 F. 699 (3d Cir. 1913). We have no doubt that Congress intended statutory subject matter to include any tangible thing made by man, including man-made compositions of matter and man-made living organisms. However, there is a fundamental difference in nature between "machines, manufactures, or compositions of matter," which are things, and a "process," which refers to acts. Lundgren, 76 USPQ2d at 1397. It is not clear that "anything under the sun made by man" was intended to include every series of acts conceived by man.

(7) "Machines, manufactures, and compositions of matter," as defined by the Supreme Court, refer to physical things having physical structure or substance. Id. at 1397. Machines, manufactures, and man-made compositions of matter broadly cover every possible "thing made by man." Id.

A statutory subject matter problem in these categories arises only in the "special case" of transformation of data by a general purpose machine (e.g., a general purpose computer) claimed as a machine or a

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committee report that said something different. It said a person may have invented a machine or a manufacture, which may include anything under the sun that is made by man.

So referring to that doesn't help solve the problem where we're not talking about a machine or a manufacture. Rather we are talking about what has to be done in order to make an abstract idea fall within the patent act. Now, sometimes you can make that happen by connecting it with some physical things in the world and sometimes you can't.

machine-implemented process, or a manufacture (a computer program embodied in a tangible medium which is capable of performing certain functions when executed by a machine).[6] Where the

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[6] The "special case" arises where the claim recites a programmed general purpose "machine" (*e.g.*, a "computer" or "system"), instead of a new structure; i.e., where what applicant claims is the method to be performed on a known machine. The CCPA and the Federal Circuit have held that a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions. See In re Alappat, 33 F.3d 1526, 1554, 31 USPQ2d 1545, 1558 (Fed. Cir. 1994) (en banc). Nevertheless, a programmed general purpose machine which merely performs an abstract idea, such as a mathematical algorithm, has been held nonstatutory as an attempt to patent the abstract idea itself, see Gottschalk v. Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676(1972) ("nutshell" holding) and In re de Castelet, 562 F.2d 1236, 1243, 195 USPQ 439, 445 (CCPA 1977) (discussing "nutshell" language), whereas a claim directed to a new machine structure is clearly a patentable "machine" under § 101.

Although a case has not yet been presented, we believe that a similar "special case" exists for "manufactures" which store programs that cause a machine to perform an abstract idea, *e.g.*, a computer program to perform a mathematical algorithm stored on a tangible medium: the nominal recitation of a "manufacture" does not preclude the claim from being nonstatutory subject matter, just as the nominal recitation of a "machine" does not preclude a claim from being nonstatutory subject matter. Normally, "functional descriptive material," such as data structures and computer programs, on a tangible medium qualifies as statutory subject matter and the nature of the recorded material may not be ignored under the "printed matter" doctrine. See Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478, 7481-82 (February 28, 1996), 1184 Off. Gaz. Patent and Trademark Office (O.G.) 87, 89 (March 26, 1996) (defining "functional" and "nonfunctional descriptive material"); In re Lowry, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994). However, applicants should not be able to evade § 101 by a nominal claim to structure. Computer programs are distin-

transformation of data represents an "abstract idea" (e.g., a mathematical algorithm), the fact that the claimed subject matter would otherwise be considered statutory because it nominally recites a "machine" or machine implemented "process" or "manufacture" storing information to be read by a machine, will not prevent the claim from being held unpatentable. Id. at 1407-08 (citing cases where machine claims for performing mathematical algorithms were held nonstatutory).

(8) A "process" is the most difficult category of § 101 to define. Id. at 1398. Not every process in the dictionary sense constitutes a "process" under § 101. Id. When Congress approved changing "art" to "process" in the 1952 Patent Act, it incorporated the definition of "process" that had evolved in the courts. Id. "Art" in the pre-1952 statute is not the same as the "useful arts" in the Constitution. See footnote 4. The Supreme Court has arguably defined a "process" as "an act, or series of acts, performed on the subject matter to be transformed and reduced to a different state or thing." See Lundgren, 76 USPQ2d at 1398. The subject matter transformed may be tangible (matter) or intangible (some form of energy, such as the conversion of electrical signals or the conversion of heat into other forms of energy (thermodynamics)), but it must be physical. Id. at 1398-99. The transformation test also conforms to many individuals'

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guished from passive non-functional descriptive material stored on a medium (e.g., music or information stored on a compact disc), which is usually addressed as "printed matter" under § 103. But see Alappat, 33 F.3d at 1554, 31 USPQ2d at 1566 (Archer, C.J., concurring in part and dissenting in part) ("The discovery of music does not become patentable subject matter simply because there is an arbitrary claim to some structure.").

expectations that they only have to worry about patent infringement when dealing with methods associated with industry and the production of goods. The transformation definition of a "process" provides an objective test to analyze claims for statutory subject matter because one can identify, analyze, and discuss what and how subject matter is transformed.

The transformation test is not without problems as evidenced by the dissent in Labcorp, where the question was whether a "test" step that required a physical transformation of a blood sample made the claim statutory. Justice Breyer stated that "the process described in claim 13 is not a process for transforming blood or any other matter," Labcorp, 126 S. Ct. at 2927, 79 USPQ2d at 1070, which can be interpreted to mean that while the test step might require a transformation, no physical transformation steps are recited, and/or that the claim as a whole is not directed to a transformation (it is not to a method of performing a test). The CCPA and the Federal Circuit have addressed such limitations as "data gathering" steps. Lundgren, 76 USPQ2d at 1427-28.

(9) A generally recited "process" claim is not limited to the means disclosed for performing it. Id. at 1400-01. Methods tied to a machine generally qualify as a "process" under § 101 because machines inherently act on and transform physical subject matter, id. at 1400, and new uses for known machines are a "process" under 35 U.S.C. § 100 (b). The principal exception is the "special case" of general purpose machine-implemented processes that merely perform an "abstract idea" (the best known example of which is a mathematical algorithm); see id. at 1407-08 (cases where machine-implemented process claims for performing mathematical algorithms were

held nonstatutory). Statutory processes are evidenced by physical transformation steps, such as chemical, electrical, and mechanical steps. Id. at 1401. A statutory "process" involving a transformation of physical subject matter can be performed by a human. Id. at 1400-01. Not every step requiring a physical action results in a patentable physical transformation, e.g., "negotiating a contract," "convening a meeting, etc." Id.

(10) Some subject matter, although invented by man, does not fall within any of the four categories of § 101, e.g., data structures, computer programs, documents, music, art, and literature, etc. Id. at 1401-02.

(11) The judicially recognized exclusions are limited to "laws of nature, natural phenomena, and abstract ideas." Id. at 1402-03. There are no separate "mathematical algorithm" or "business method" exclusions. Id. Of course, this does not mean that "mathematical algorithms" and "business methods" are necessarily statutory, but only that claims cannot be rejected just because they contain mathematical steps or business concepts: the analysis must be framed in terms of the three recognized exclusions.

(12) "Laws of nature" and "natural phenomena" exclusions can be explained by the fact that the "discovery" of a preexisting law of nature, a principle of physical science, or a natural phenomenon does not meet the "invents" requirement of § 101: they are not inventions "made by man," but are manifestations of nature, free to all. Id. at 1403.

(13) "Abstract ideas" refer to disembodied plans, schemes, or theoretical methods. Id. at 1404. "Abstract ideas" can represent a discovery of a "law of nature" or a "physical phenomenon" or a man-made

invention.[7] Id. Mathematical algorithms are the most well known example of an abstract idea, but there is no reason why the abstract idea exception should be limited to mathematical algorithms. Id. Abstract ideas are usually associated with method claims

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[7] Judge Rader states:

> In determining what qualifies as patentable subject matter, the Supreme Court has drawn the distinction between inventions and mere discoveries. On the unpatentable discovery side fall "laws of nature, natural phenomena, and abstract ideas." On the patentable invention side fall anything that is "not nature's handiwork, but [the inventor's] own." [Citations omitted.]

Alappat, 33 F.3d at 1582, 31 USPQ2d at 1590 (Rader, *J.*, concurring). There is no question that any "machine, manufacture, or [man-made]-composition of matter" is a man-made physical thing, not a law of nature, natural phenomenon, or abstract idea, and is patentable eligible subject matter under § 101 (subject to the "special case" of general purpose machines and manufactures that merely perform "abstract ideas"). However, we disagree with Judge Rader's statement to the extent it implies that everything conceived by man and claimed as a method is a patentable invention. Unpatentable "abstract ideas" can represent "inventions" made by man as well as "discoveries" of things that existed in nature, and are easily claimed as a series of steps so as to appear to be a "process" under § 101. For example, mathematical algorithms (the best known example of an abstract idea) can be "abstract ideas" that do not represent a discovery of something that existed in nature. See In re Meyer, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems."). A claim to a method of government would appear to be an unpatentable abstract political idea even though it is a creation of human thinking that can be claimed as a method. Not every claim to a series of steps "invented by man" is a "process" under § 101.

because a "machine, manufacture, or composition of matter" are tangible things and not disembodied concepts. Abstract ideas performed on general purpose machines or embodied in a generic manufacture constitute a "special case" where subject matter that appears to be nominally within § 101 is nonstatutory.

One possible identifying characteristic of an abstract idea is the lack of transformation of any physical subject matter according to the definition of a "process" under § 101 described supra. Another possible identifying characteristic is if the claim is so broad that it covers (preempts) any and every possible way that the steps can be performed, because there is no "practical application" if no specific way is claimed to perform the steps. Id. at 1405. This may be illustrated by the claim discussed in the dissent in Labcorp, where the "words 'assaying a body fluid' refer to the use of any test at all, whether patented or not patented,"126 S. Ct. at 2924, 79 USPQ2d at 1067, and "Claim 13 . . . tells the user to use any test at all," – *id*. at 2927, 79 USPQ2d at 1070. See also Tilghman v. Proctor, 102 U.S. 707, 726-27 (1880) (discussing overbreadth of Morse's eighth claim in O'Reilly v. Morse, 56 U.S. 62 (1854) compared to the scope of enablement). Incidental physical limitations, such as data gathering, field of use limitations, and post-solution activity are not enough to convert an "abstract idea" into a statutory "process." Lundgren, 76 USPQ2d at 1405 and 1427-28. A method may not be considered an "abstract ideal" if it produces an objectively measurable result (*e.g*., a contract as a result of a negotiation method or a slower heartbeat as a result of a meditation technique), but it may still not qualify as a "process" under § 101 if it does not perform a transformation of physical subject matter.

(14) "Laws of nature, natural phenomena, and abstract ideas" can be thought of as "exclusions" or "exceptions," but the terms are not necessarily synonymous. An "exclusion" refers to subject matter that is not within § 101 by definition. See, e.g., Diamond v. Diehr, 450 U.S. at 185, 209 USPQ at 7 ("This Court has undoubtably recognized limits to §101 and every discovery is not embraced within the statutory terms. Excluded from such patent protection are laws of nature, physical phenomena and abstract ideas." (Emphasis added.)). The term "exclusion" (from the Latin, "to shut out") carries more of the connotaton a definition that does not encompass certain subject matter. An "exception" (from the Latin, "to take out") tends to refer to subject matter that would fall within § 101 "but for" some exceptional condition. The cases, like ordinary language, do not make strong distinctions between the two words and they tend to use them interchangeably. When the point of view is clear, the distinction is without a difference. Lundgren, 76 USPQ2d at 1405.

A great deal of confusion—not to say mischief—may arise when advocates (or decision makers) mistake the analytical process for the subject matter. For example, the position that not every series of steps is a "process" under § 101 is consistent with the idea that "abstract ideas" are excluded from § 101. On the other hand, if every series of steps is a "process" under § 101, then, in order to preserve the Supreme Court precedent that abstract thoughts are not patentable, it is necessary to recognize that certain "processes" are exceptions to the general rule.

(15) There is a long history of mathematical algorithms as abstract ideas before State Street and AT&T. Id. at 1406-11. One of the main issues after

Gottschalk v. Benson was the "special case" of determining when machine claims (including apparatus claims in "means-plus-function" format) and machine implemented process claims, which recited mathematical algorithms, were unpatentable. This led to the two-part Freeman-Walter-Abele test. Id. at 1409-10.

(16) We interpret the State Street and AT&T test of a "useful, concrete and tangible result" to be limited, at present, to claims to machines and machine-implemented processes, i.e., to the "special cases" of claims that might be within § 101 because they recite structure, but which involve an abstract idea issue. Id. at 1411-13. The Federal Circuit recognized that "certain-types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, *i.e.*, 'a useful, concrete and tangible result.'" State Street, 149 F.3d at 1373, 47 USPQ2d at 1600-01 (citing In re Alappat, 33 F.3d at 1544, 31 USPQ2d at 1557). The full statement in Alappat reads: "This [claimed invention] is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." (Emphasis added.) Alappat, 33 F.3d at 1544, 31 USPQ2d at 1557. Alappat, Arrhythmia Research Technology Inc. v. Corazonix Corp., 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992), State Street, and AT&T all involved transformation of data by a machine. The court specifically held that transformation of data representing some real world quantity (a waveform in Alappat, an electrocardiograph signals from a patient's heartbeat in Arrhythmia, or discrete dollar amounts in State Street) by a machine was a practical application of a mathematical algorithm,

formula, or calculation that produced "a useful, concrete and tangible result," and that a method of applying a PIC indicator "value through switching and recording mechanisms to create a signal useful for billing purposes," AT&T, 172 F. 3d at 1358, 50 USPQ2d at 1452, a machine-implemented process, was "a useful, concrete, tangible result." See Lundgren, 76 USPQ2d at 1411-16 (APJ Barrett, concurring-in-part and dissenting-in-part) (holding that the State Street test, so far, is limited to transformation of data by machines and machine-implemented processes). The test in Alappat may derive from the classical definition of a "machine": "The term machine includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. 252, 267 (1854).

However, the fact that the court in AT&T commented on In re Grams, 888 F.2d 835, 12 USPQ2d 1824 (Fed. Cir. 1989), and In re Schrader, 22 F.3d 290, 30 USPQ2d 1455 (Fed. Cir. 1994), which both involved non-machine-implemented process claims, as being "unhelpful" because they did not ascertain if the end result of the claimed process was useful, concrete, and tangible, AT&T, 172 F.3d at 1360, 50 USPQ2d at 1453, leaves open the question of whether the "useful, concrete and tangible result" test is intended to be extended past the original facts of the machine-implemented invention.

(17) Justice Breyer in his dissent in Labcorp stated in dicta that it is highly questionable whether the "useful, concrete and tangible result" test is a general test for statutory subject matter: "[State Street] does say that a process is patentable if it produces a 'useful, concrete, and tangible result.' 149 F.3d, at

1373. But this Court has never made such a statement and, if taken literally, the statement would cover instances where this Court has held the contrary." 126 S. Ct. at 2928.

(18) None of Alappat, State Street, or AT&T states where the "useful, concrete and tangible result" terms come from or how they are defined. It seems that "concrete" and "tangible" have essentially the same meaning, and that a "concrete and tangible result" is just the opposite of an "abstract idea." The term "useful" appears to refer to the requirement in § 101, which is a separate requirement from the patent eligible subject matter requirement. Id. at 1416. Thus, it is not clear to us what is meant by the test. It may be that the test is merely a restatement of existing principles rather than a completely new test. Id. Transformation of data by a machine which represents an abstract idea (for example, but not limited to, a mathematical algorithm) is not statutory just because it is nominally claimed as a machine or a machine-implemented process. Id. at 1407-8. Such "special cases" have always been difficult to address. For now, we interpret the State Street and AT&T test to be a test for when transformation of data by a machine is statutory subject matter. The test could be clarified by the facts of the cases: (1) transformation of data (i.e., electrical signals representing data) is by a machine; (2) the data corresponds to something in the "real world"; and (3) no physical acts need to occur outside of the machine (internal transformation of electrical signals by the machine is sufficient). Id. at 1411. If the Federal Circuit intends to create a new general test for statutory subject matter regardless of whether it involves transformation of data (signals) by a machine, then further explanation in an appropriate case is needed.

(19) Non-machine-implemented process claims present additional issues to analyze for statutory subject matter. "Process" claims recite acts and are fundamentally different from "machine, manufacture, or composition of matter" claims, which recite things. Process claims do not have to recite structure for performing the acts. Acts are inherently more abstract than structure. While there is seldom disagreement about physical things falling into one of the statutory classes, it is not always easy to determine when a series of steps is a statutory "process" under § 101.

Where the steps define a transformation of physical subject matter (tangible or intangible) to a different state or thing, as normally present in chemical, electrical, and mechanical cases, there is no question that the subject matter is statutory; e.g., "mixing" two elements or compounds is clearly a statutory transformation that results in a chemical substance or mixture although no apparatus is claimed to perform the step and although the step could be performed manually. Id. at 1417.

(20) There are several issues that complicate analysis of non-machine-implemented processes: (1) a claim that is so broad that it covers both statutory and nonstatutory subject matter; (2) the statement in In re Musgrave, 431 F.2d at 893, 167 USPQ at 289-90, that it makes no difference whether steps are performed by a machine or mentally, as long as they are in the "technological arts"; (3) how to determine when a transformation of physical subject matter takes place; (4) whether minor physical limitations can define a statutory process; and (5) whether methods that can only be performed by a human, e.g.,

sports moves, are patentable subject matter. Lundgren, 76 USPQ2d at 1417.

(21) Although this question does not appear to have been formally decided by the Federal Circuit, we are of the opinion that claims that read on statutory and nonstatutory subject matter should be rejected as unpatentable. Id. at 1417-24. This problem is most critical in method claims because method claims do not have to recite what structure is used to perform the steps, making them abstract in nature, whereas claims to things, "machines, manufactures, or compositions of matter," easily fall within § 101 (subject to the "special case" of abstract ideas performed on machines). The USPTO rejects method claims when they are interpreted to be so broad that they are directed to the abstract idea itself, rather than a practical implementation thereof; e.g., a series of steps without any recitation of how the steps are performed might be rejected as nonstatutory subject matter as an "abstract idea," whereas the same series of steps, if performed by a machine, might be statutory as a practical application of the abstract idea.

(22) The "technological arts" test for statutory subject matter originated in response to "mental steps" rejections. Where the steps of the claim were so broad that they could be performed mentally by a human operator (although the claim did not recite how the steps were performed), the claim was rejected as not defining statutory subject matter even though if the steps were performed by a machine it would constitute statutory subject matter. This is the situation of the claims reading on statutory and nonstatutory subject matter. The court in Musgrave declined to follow the approach of previous cases of determining whether the claim, interpreted reasona-

bly, read upon mental implementation of the process or was confined to a machine implementation. Id. at 1419. The court held that process claims which could be done by purely mental processes (what might today be called "abstract ideas"), as well as by machine, were statutory as long as the steps were in the "technological arts." Id. at 1420. It was not explained how "technological arts" were to be determined. Judge Baldwin concurred, objecting to the majority's analysis and writing, "suppose a claim happens to contain a sequence of operational steps which can reasonably be read to cover a process performable both within and without the technological arts? This is not too far fetched. Would such a claim be statutory? … We will have to face these problems some day." Musgrave, 431 F.2d at 896, 167 USPQ at 291. This test, as a separate test, seems to have been implicitly overruled by Gottschalk v. Benson. Lundgren, 76 USPQ2d at 1425.

The Board held in Lundgren that the "technological arts" test is not a separate and distinct test for statutory subject matter. Id. at 1388. Although commentators have read this as eliminating a "technology" requirement for patents, this is not what was stated or intended. As APJ Barrett explained, "[t]he 'technology' requirement implied by 'technological arts' is contained within the definitions of the statutory classes." Id. at 1430. All "machines, manufactures, or [man-made] compositions of matter" are things made by man and involve technology. Methods which define a transformation of physical subject matter from one state or thing to another involve technology and qualify as a statutory "process" under § 101. The definitions of the statutory classes and application of the exclusions are the proper tests. A process may involve technology because it meets the

transformation of physical subject matter definition of a "process" under §101, even though it does not require performance by a machine. Id. at 1428. The "technological arts" is not a useful, objective test because it was never defined as anything except as a more modern term for the "useful arts." The use of such a test would result in conclusory rejections, which are unreviewable, just as many claims in the past were rejected as "business methods" because they involved some business aspect (e.g., accounting).

(23) Not all physical limitations in a claim directed to an abstract idea (e.g., a mathematical algorithm) were sufficient to define a statutory process prior to State Street. This case law regarding data gathering, field-of-use limitations, and post-solution activity, which includes Supreme Court precedent, should still apply to determining whether non-machine-implemented process claims are directed to an abstract idea or a practical application of that idea. Id. at 1427-28; cf. Labcorp, 126 S. Ct. at 2927-28 (initial step of "assaying a body fluid" does not render the claim patentable). It is difficult to determine when such steps are enough to define statutory subject matter.

(24) Claims that can only be performed by a human, such as dance and sports moves, meditation techniques, etc., present difficult questions under—101. Id. at 1428-29. Surgical methods are performed by humans, but since they involve the application of scientific medical knowledge to transform human and animal tissue they are readily classifiable as a type of manufacturing process. Id. at 1429. This issue is not present in this case, but we believe any judicial review of this decision should recognize that the present case is only one in a broad spectrum of cases

involving what the USPTO perceives to be nonstatutory subject matter.

(25) The concurrence/dissent in Lundgren concludes that there are three possible existing tests for statutory subject matter of non-machine-implemented methods: (1) the definition of a "process" under, § 101 requires a transformation of physical subject matter (which is interpreted to mean matter or some form of energy) to a different state or thing; (2) the judicially recognized exclusions for "abstract ideas, laws of nature, or natural phenomena"; and (3) the "useful, concrete and tangible result" test of State Street. Id. at 1429-30.

(26) In summary, the concurrence/dissent in Lundgren makes the following conclusions about non-machine-implemented method claims, which hopefully will be addressed by the Federal Circuit.

(a) Not every process in the dictionary sense is a "process" under § 101; i.e., not every series of steps is a "process" under § 101.

(b) The definition of a "process" under § 101 requires a transformation of physical subject matter to a different state or thing.

(i) The physical subject matter transformed can be matter (an object or material) or some form of energy (e.g., heat into mechanical motion; electromagnetic waves progagating in space into electrical current in a wire; etc.).

(c) The oft-quoted statement that "Congress intended statutory subject matter to 'include anything under the sun that is made by man,'" is based on the Senate Report statement that "[a] person may have 'invented' a machine or manufac-

ture, which may include anything under the sun made by man." The Senate Report indicates that things made by man ("machines, manufactures, or [man-made] compositions of matter") are statutory, but does not imply that Congress intended every concept conceived by man that can be claimed as a method to be patentable subject matter.

(d) Some claims that nominally fall within § 101 because they recite a general purpose machine or a method performed on a general purpose machine (e.g., "a computer-implemented method comprising …") may nonetheless be nonstatutory subject matter if all that is performed is an "abstract idea." This is a "special case" because the subject matter is technically within § 101 by virtue of the machine, as opposed to an exclusion that was never within § 101.

(e) "Abstract ideas" can represent ideas "made by man."

(f) Possible indicia of an "abstract idea" may be (i) the lack of transformation of physical subject matter according to the definition of a "process" under § 101, and/or (ii) the claim covers (preempts) any and every possible way that the steps can be performed.

(g) Physical steps or limitations in a claim are not necessarily sufficient to convert the claim into statutory subject matter, e.g., data-gathering steps, field of use limitations, and minimal post-solution activity.

(h) It is possible that a non-machine-implemented method may be nonstatutory subject matter if it does not perform a transformation of physical subject matter even though it contains physical

steps that might prevent if from being labeled an "abstract idea."

(i) The holding of State Street is limited to transformation of data by a machine.

(j) AT&T involved a machine-implemented process claim.

(k) The "useful, concrete and tangible result" test of State Street and AT&T is presently limited to machine claims and machine-implemented process claims.

(l) The terms "useful, concrete and tangible" have not yet been defined.

(m) During prosecution, claims that read on statutory and nonstatutory subject matter should be held to be unpatentable.

(n) There is no separate "technological arts" test for statutory subject matter.

Interim Guidelines

After Lundgren, the USPTO published Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Interim Guidelines), 1300 Off. Gaz. Patent and Trademark Office (O.G.) 142 (Nov. 22, 2005). The Interim Guidelines do not track the analysis in Lundgren, which principally focused on non-machine-implemented method claims The Interim Guidelines indicate that statutory subject matter: (1) must fall within one of the statutory categories of § 101, 1300 O.G. at 145; and (2) must not fall within one of the judicially recognized exceptions for "laws of nature, natural phenomena, and abstract ideas," id. The Interim Guidelines state that while "laws of nature, natural phenomena, and

abstract ideas" are not eligible for patenting, a practical application may be patented, id. A practical application can be identified by tests: (a) a physical transformation of an article to a different state or thing, id. at 146; or (b) the production of a "useful, concrete and tangible result," id., i.e., the State Street test applied to all claims, whether or not machine-implemented. The Interim Guidelines also state that (c) the claim must not preempt every "substantial practical application" of the of nature, natural phenomena, or abstract idea, id.

Guidelines are intended to instruct examiners on how to apply the law to the facts. The Board is not bound by such guidelines,[8] but applies the law directly to the facts. The Interim Guidelines state: "Rejections will be based upon the substantive law and it is these rejections which are appealable. Consequently, any failure by USPTO personnel to follow the Guidelines is neither appealable nor petitionable." Id. at 142, under "Introduction." Although the analysis will apply the Interim Guidelines in the alternative, this exercise underscores, for this panel, several problems with the Interim Guidelines that limit their usefulness severely.

First, the Interim Guidelines implicitly concede that any series of steps is a "process" under § 101 and

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[8] From the movie Pirates of the Caribbean (Disney 2003):

> Elizabeth: You have to take me to shore! According to the Code of the Order of the Brethren.
>
> Barbossa: First, your return to shore was not part of our negotiations nor our agreement, so I 'must' do nothin'. And secondly, you must be a pirate for the pirate's code to apply, and you're not. And thirdly, the code is more what you call guidelines than actual rules. Welcome aboard the Black Pearl, Miss Turner.

does not address the case law that says that not every process in the dictionary sense is a "process" under § 101. See Gottschalk v. Benson, 409 U.S. at 64, 175 USPQ at 674 ("The question is whether the method described and claimed is a 'process' within the meaning of the Patent Act."); Parker v. Flook, 437 U.S. 584, 588 n.9, 198 USPQ 193, 196 n. 9 (1978) ("The statutory definition of 'process' is broad.… An argument can be made, however, 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.'"); id. at 589, 198 USPQ at 197 ("The holding [in Gottschalk v. Benson] that the discovery of that method could not be patented as a 'process' forecloses a purely literal reading of § 101."); Lundgren, 76 USPQ2d at 1398-1401. "Process" claims are inherently more abstract than "machine, manufacture, or composition of matter" claims, which are directed to physical things, because a "process" is not limited to, or required to recite, the means for performing the steps. Id. at 1400-01. If it is conceded that every series of steps is a "process" under § 101, then one possible statutory subject matter test is lost.

Second, the Interim Guidelines do not provide any directions for how examiners should determine whether the claimed invention is to an "abstract idea, law of nature, or natural phenomenon" except by finding that it is not a practical application as defined by tests (a), (b), and (c). The Interim Guidelines treat "abstract ideas, laws of nature, or natural phenomena" as exceptions rather than exclusions, i.e., claims are statutory "but for" some condition.

Third, the Interim Guidelines state that a transformation or reduction of an article to a different

state or thing is a statutory practical application. Interim Guidelines, 1300 O.G. at 146. This perpetuates the misunderstanding that "transformation" requires transformation of a tangible object or article, contrary to cases that explain that the subject matter transformed can be physical, yet intangible, phenomena such as electrical signals. See In re Schrader, 22 F.3d 290, 29 §n.12, 30 UPSQ2d 1455, 1459 n.12 (Fed. Cir. 1994) ("In the Telephone Cases, 126 U.S. 1 … (1887), the Court upheld the validity of a claim directed to a method for transmitting speech by impressing acoustic vibrations representative of speech onto electrical signals. If there was a requirement that a physical object be transformed or reduced, the claim would not have been patentable. … Thus, it is apparent that changes to intangible subject matter representative of or constituting physical activity or objects are included in this definition"); Lundgren, 76 USPQ2d at 1398-99.

Fourth, the Interim Guidelines adopt the "useful, concrete and tangible result" test of State Street as a general test for patentable subject matter without addressing the fact that the holding of State Street was qualified by transformation of data by a machine and that AT&T involved a machine-implemented process claim. Id. at 1411-13. It may be that the State Street test can be adapted as a general test, but the factual differences between machine claims or machine-implemented process claims and nonmachine-implemented process claims are significant and have not been addressed by the Federal Circuit. Machines inherently act to transform physical subject matter (tangible or intangible) to a different state or thing. As recognized in the earlier Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. at 7484, 1184 O.G. at 92: "There is always some form of

physical transformation within a computer because a computer acts on signals and transforms them during its operation and changes the state of its components during the execution of a process." Machine-implemented processes nominally fit within the definition of a "process" under § 101, but may not necessarily be statutory under the special circumstances involving transformation of data by a machine, which are addressed by the State Street test. The State Street "useful, concrete and tangible result" test is more readily understood and applied if it is limited to machine claims and machine-implemented process claims, which are already nominally within § 101, because a machine (almost always a programmed computer) that does no more than perform the steps of an abstract idea is not a practical application of the abstract idea. Thus, the State Street test requires that the practical application must be recited in the claims. The fact that an abstract idea is capable of being practically applied, and that a practical application is disclosed, does not make a broad claim to the abstract idea itself patentable. A claim which covers both statutory and nonstatutory subject matter should be held unpatentable, see Lundgren, 76 USPQ2d at 1417-24.

Fifth, the Interim Guidelines attempt to define the terms "useful," "concrete," and "tangible," but have not cited any support in § 101 cases dealing with patent eligible subject matter. Moreover, the proposed "definitions" seem to be circular and therefore unhelpful. The statutory categories of § 101 ("process, machine, manufacture, or composition of matter") define eligible subject matter, i.e., subject matter that can be patented. The terms "new and useful" in § 101 refer to other conditions for patentability. "It may be useful to think of eligibility as a precondition for

patentability, and of utility as one of the three fundamental conditions for patentability, together with novelty … and nonobviousness ….” Robert L. Harmon, Patents and the Federal Circuit 40 (4th ed. Bureau of National Affairs, Inc. 1998). See Lundgren, 76 USPQ2d at 1395-96. “Notwithstanding the words ‘new and useful’ in § 101, the invention is not examined under that statute for novelty because that is not the statutory scheme of things or the long-established administrative practice.” State Street, 149 F.3d at 1373 n.2, 47 USPQ2d at 1600 n.2 (citing In re Bergy, 569 F.2d 952, 960, 201 USPQ 352, 360 (CCPA 1979)). It seems that the “useful result” part of the State Street test refers to the “utility” requirement of § 101, which is a separate requirement from patent eligible subject matter, yet this is not questioned by the Interim Guidelines. The Interim Guidelines define “tangible” as the opposite of “abstract,” 1300 O.G. at 146, which adds nothing of substance or guidance to the abstract idea exception, and no case is cited for the definition. The Interim Guidelines define “concrete” as the opposite of “unrepeatable” or “unpredictable,” id., yet we find no dictionary that supports this definition. The case cited in support, In re Swartz, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000) (because asserted results in the area of cold fusion were “irreproducible,” claims were properly rejected under § 101), relates to utility, not to patent eligible subject matter. In our opinion, the terms “concrete and tangible” essentially say the same thing, that the result is not just an “abstract idea,” but is “actual and real.”

Sixth, the Interim Guidelines do not provide any guidance as to how examiners should determine

whether the claimed invention preempts an "abstract idea, law of nature, or natural phenomenon."

Analysis

Claim interpretation

The meaning of the claim language is not in dispute.

Technological arts

The Board held in Lundgren that the "technological arts" is not a separate and distinct test for statutory subject matter. Lundgren, 76 USP2d at 1388. Accordingly, the examiner's rejection in this case, to the extent that it is based on a "technological arts" test, is reversed.

Nevertheless, the examiner's reasoning that the method is not technological because no specific apparatus is disclosed to perform the steps and because the only way to perform the steps is by a human is not persuasive. "It is probably still true that, as stated in In re Benson, 'machines—the computers—are in the technological field, are a part of one of our best-known technologies, and are in the "useful arts" rather than the "liberal arts," as are all other types of "business machines," regardless of the uses to which their users may put them,' 441 F.2d at 688, 169 USPQ at 553, with the exception noted in Gottschalk v. Benson, that a machine which executes a mathematical algorithm is not patentable under § 101." Lundgren, 76 USPQ2d at 1416. The cases do not imply that a process is not in the technological arts if it is not performed on a machine. Musgrave, the case the examiner relies on for the "technological arts" test, did not require a machine and, in fact, held that steps performed mentally could be patentable.

Although we disagree that mental steps can be patentable, we conclude that a method performed by a human may be statutory subject matter if there is a transformation of physical subject matter from one state to another; e.g., "mixing" two elements or compounds to produce a chemical substance or mixture is clearly a statutory transformation although no apparatus is claimed to perform the step and although the step could be performed manually.

Application of the Lundgren and Guidelines tests

Lundgren

The three tests identified in the concurrence/dissent in Lundgren are applied below.

(1) Transformation

Claim 1, as is common with method claims, does not recite how the steps of "initiating a series of transactions between said commodity provider and consumers of said commodity," "identifying market participants," and "initiating a series of transactions between said commodity provider and said market participants," are implemented. Appellants acknowledge "that the steps of the method need not be 'performed' on a computer" (Br6) and, thus, there is no implicit transformation of electrical signals from one state to another as happens in a computer. The steps do not transform any physical subject matter (matter or some form of energy) into a different state or thing. Claim 1 does not involve transformation of data, at least not in the usual sense of a specific, well-defined series of steps (i.e., an algorithm) performed on data as in a computer-implemented process. The last clause of claim 1, "such that said series of market participant transactions balances the risk position of said series of consumer transaction,"

indicates that what are transformed are the non-physical financial risks and legal liabilities of the commodity provider, the consumer, and the market participants having a counter-risk position to the consumer. Accordingly, the steps of claim 1 do not define a statutory "process" under § 101 using the "transformation" test.

Claim 2 depends on claim 1 and defines the commodity as energy and the market participants as transmission distributors. Claim 3 depends on claim 2 and defines the consumption risk as a weather-related price risk. These claims limit the commodity, the market participants, and the type of risk, but do not add any physical transformation. That the method is limited to a particular environment does not make it statutory subject matter. Cf. Diamond v. Diehr, 450 U.S. at 191, 209 USPQ at 10 ("A mathematical formula as such is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." (Citations omitted.)). Claims 2 and 3 do not define a statutory "process" under § 101 using the test.

Independent claim 4 is similar to claim 1, as modified by claims 2 and 3, but also defines the "fixed price" in terms of a mathematical expression. The mathematical expression does not add any transformation of physical subject matter. Claim 4 is directed to nonstatutory subject matter because the claim as a whole does not perform a transformation of physical subject matter, not because it contains a mathematical expression.

Claim 5 depends on claim 4 and defines the location-specific weather indicator as at least one of heating degree days and cooling degree days. This

merely qualifies the data and does not add a transformation of physical subject matter. Claim 5 does not define a statutory "process" under §101 using the "transformation" test.

Claim 6 depends on claim 4 and states that the energy provider seeks a swap receipt to cover the marginal weather driven cost. It appears that a "swap receipt" is a payment from the other energy market participants, such as a distribution company, involved in the swap (specification, pages 5-6). A swap transaction does not involve a transformation of physical subject matter from one state to another, so claim 6 does not define a statutory "process" under § 101 using the "transformation" test.

Claims 7 and 10 depend on claim 4 and recite steps for determining the energy price. The assumptions and mathematical procedures on data do not recite a physical transformation. The claimed subject matter is unpatentable because it does not define a physical transformation, not because it contains mathematical operations. Claims 7 and 10 do not define a statutory "process" under § 101 using the "transformation" test.

Claims 8 and 11 depend on claim 4 and recite steps for establishing a cap on the weather-influenced pricing. The assumptions and mathematical procedures on data do not define a physical transformation of subject matter. Claims 8 and 11 do not define a statutory "process" under § 101 using the "transformation" test.

Claim 9 depends on claim 1 and states that the commodity provider seeks a swap receipt to cover the price risk of the consumer transaction. As noted with respect to claim 6, a swap receipt does not involve a statutory transformation. Claim 9 does not define a

statutory "process" under § 101 using the "transformation" test.

Therefore, claims 1-11 are directed to nonstatutory subject under 35 U.S.C. § 101 under the "transformation" test.

(2) "Abstract idea" exclusion

The subject matter of claim 1 is also directed to an "abstract idea" or, at least, it is nonstatutory because it broadly covers both a nonstatutory "abstract idea" and any specific physical implementation of it that might possibly be statutory. Claim 1 describes a plan or scheme for managing consumption risk cost in terms of a method. It is nothing but an disembodied "abstract idea" until it is instantiated in some physical way so as to become a practical application of the idea. The steps of "initiating a series of transactions" and the step of "identifying market participants" merely describe steps or goals in the plan, and do not recite how those steps are implemented in some physical way: the steps remain disembodied. Because the steps cover ("preempt") any and every possible way of performing the steps of the plan, by human or by any kind of machine or by any combination thereof, we conclude that the claim is so broad that it is directed to the "abstract idea" itself, rather than a practical implementation of the concept. While actual physical acts of individuals or organizations would, no doubt, be required to implement the steps, and while the actual implementation of the plan in some specific way might be considered statutory subject matter, the fact that claim 1 covers both statutory and nonstatutory subject matter does not make it patentable. Thus, we further hold that claim 1 is directed to nonstatutory subject matter under the "abstract idea" exclusion.

We consider the "abstract idea" test to be in addition to the transformation test. There may be times where it is easier to analyze the subject matter as an "abstract idea" or where the "abstract idea" test can be used as a backup check on the transformation test. However, there may be times where the steps cannot fairly be considered an "abstract idea," e.g., because of actual physical steps, but where the claims do not define a transformation of physical subject matter.

Claim 2 depends on claim 1 and defines the commodity as energy and the market participants as transmission distributors. Claim 3 depends on claim 2 and defines the consumption risk as a weather-related price risk. This limits the commodity, the market participants, and the type of risk, but does not describe any particular way of performing the steps that would define a practical application, instead of an abstract idea. Claims 2 and 3 are not patentable because they are to an "abstract idea."

Independent claim 4 is similar to claim 1, as modified by claims 2 and 3, but also defines the "fixed price" in terms of a mathematical expression. A mathematical expression by itself is an abstract idea and, therefore, the combined subject matter is also an "abstract idea." The claimed subject matter as a whole describes an "abstract idea."

Claim 5 depends on claim 4 and defines the location-specific weather indicator as at least one of heating degree days and cooling degree days. This merely qualifies the data and does not define a practical application. Claim 5 is directed to nonstatutory subject matter under the "abstract idea" exclusion.

Claim 6 depends on claim 4 and states that the energy provider seeks a swap receipt to cover the

marginal weather-driven cost. It appears that a "swap receipt" is a payment from the other energy market participants, such as a distribution company, involved in the swap (specification, pages 5-6). Since no specific method of seeking the swap receipt is claimed, no practical application of the abstract idea is claimed. Claim 6 is not patentable because it is an "abstract idea."

Claims 7 and 10 depend on claim 4 and recite steps for determining the energy price. Some of the steps involve assumptions and mathematical procedures on data, which are considered an "abstract idea," and the combined subject matter is therefore still an "abstract idea." Claims 7 and 10 are not statutory subject matter because they are an "abstract idea."

Claims 8 and 11 depend on claim 4 and recite steps for establishing a cap on the weather-influenced pricing. Some of the steps involve assumptions and mathematical procedures on data, which are considered an "abstract idea," and the combined subject matter is therefore still an "abstract idea." Claims 8 and 11 are an "abstract idea" and not statutory subject matter.

Claim 9 depends on claim 1 and states that the commodity provider seeks a swap receipt to cover the price risk of the consumer transaction. As noted with respect to claim 6, a swap receipt does not involve a practical application of the abstract idea. Claim 9 is an "abstract idea" and does not define statutory subject matter.

Therefore, claims 1-11 are directed to nonstatutory subject under 35 U.S.C. § 101 as an "abstract idea."

(3) Useful, concrete and tangible result

We held in (1) that the claimed subject matter on appeal does not fall within the definition of a "process" under § 101 because it does not transform physical subject matter to a different state or thing, and held in (2) that it is an "abstract idea." Claim 1 does not recite a "concrete and tangible result" or a "practical application" of the hedging plan under the State Street test, because a "concrete and tangible result" is interpreted to be the opposite of an "abstract idea" and requires some sort of physical instantiation. While the plan may be "useful" in the sense of having potential utility to society, a method that has not been implemented in some specific way is not considered practically useful in a patentability sense. Even if the method is "useful," the State Street test requires the result to be "useful" and "concrete" and "tangible," so merely being "useful" is not enough. In addition, it is the result of the claimed process that must be "useful, concrete and tangible," not just one or more steps. Therefore, we also hold that claim 1 is directed to nonstatutory subject matter because it does not recite a "practical application" or produce a "concrete and tangible result" under the State Street test, to the extent that State Street applies to non-machine-implemented process claims.

Claims 2-11 are also rejected as nonstatutory subject matter because they are directed to an "abstract idea," as discussed, and do not recite a "practical application" or produce a "concrete and tangible result" under the State Street test.

Therefore, claims 1-11 are directed to nonstatutory subject under 35 U.S.C. § 101 because they do not recite a "practical application" or a "concrete and tangible result" under the State Street test.

Interim Guidelines

The Interim Guidelines are applied as follows.

(1) Within a statutory category

The claims are drafted as a series of steps, which the Interim Guidelines considers to be a "process" under § 101.

(2) Judicially recognized exceptions

The Interim Guidelines state that while "laws of nature, natural phenomena, and abstract ideas" are not eligible for patenting, a practical application may be. Only the "abstract idea" category is at issue. The Interim Guidelines say that a practical application can be identified by: (a) a physical transformation of an article to a different state or thing; or (b) the production of a "useful, concrete and tangible result." Presumably, the Interim Guidelines consider the absence of (a) and (b) to indicate an "abstract idea." And, if the claim recites a practical application, (c) it must not preempt every "substantial practical application" of the law of nature, natural phenomena, or abstract idea.

(a) Transformation of article

The claims do not recite a transformation of an article to a different state or thing and, thus, do not recite a practical application under this test. Although we consider this to be too narrow a test, we apply the Interim Guidelines as written.

(b) "Useful, concrete and tangible result"

The Interim Guidelines define these terms, but the definitions are not based on any guidance in State Street or AT&T.

Since the method has use to society, we conclude that it recites a "useful result." It seems that the

utility requirement of § 101 is separate from the subject matter eligibility requirement, but this is not analyzed in the Interim Guidelines.

The Interim Guidelines state that "[t]he opposite of 'concrete' is unrepeatable or unpredictable," id., and cite a case dealing with utility under § 101. We do not find this definition of "concrete" in any dictionaries and, in our judgment, a case dealing with utility has little bearing on eligible subject matter. Accordingly, we do not apply this definition.

The Interim Guidelines state that "the opposite meaning of 'tangible' is 'abstract,'" 1300 O.G. at 146, so presumably a "tangible result" is the opposite of an "abstract idea." We determined in the Lundgren analysis that the claims are directed to an "abstract idea." Since the claims must meet all of the conditions of "useful" and "concrete" and "tangible," and claims 1-11 do not produce a "tangible result," they do not pass the "useful, concrete and tangible result test."

Therefore, claims 1-11 are directed to nonstatutory subject under 35 U.S.C. § 101 because they do not recite a "tangible result" under the Interim Guidelines.

(c) Preemption

We determined in the Lundgren analysis of the "abstract idea" exclusion that the claims are directed to the "abstract idea" because they cover any and every possible manner of performing the steps. Thus, it can also be said that the claims "preempt" the concept in the claimed methods. Therefore, claims 1-11 are directed to nonstatutory subject under 35 U.S.C. § 101 because they "preempt" under the Interim Guidelines.

Conclusion

For all of the reasons stated above, we conclude that claims 1-11 are not directed to statutory subject matter under 35 U.S.C. §101. Appellants' arguments, addressed next, have been considered in making this decision, but are not persuasive.

Appellants' arguments

Briefs

Appellants argue that they "are unaware of any requirement, statutory or otherwise, which requires a method claim to specify a specific apparatus upon which the method is to be performed" (Br5) and that "no 'specific apparatus upon which the process can be performed' need be specified when claiming a method" (Br5).

It is true that process claims are not required to recite the means (structure) for performing the steps. See Cochrane v. Deener, 94 U.S. 780, 787 (1877); Lundgren, 76 USPQ2d at 1400-01. Although the examiner rejected the claims as nonstatutory subject matter, in part, because they did not recite a specific apparatus, this does not form any part of the bases for our new ground of rejection. A method claim can be a "process" under §101 even when performed by hand. It is the presence of a transformation of physical subject matter that is important, not how the transformation is accomplished. Nevertheless, the absence of any apparatus in appellants' claims is evidence that the claims do not transform physical subject matter as a machine inherently would, and do not recite a practical application of the "abstract idea."

Appellants note that "[t]he specific computer hard ware or specific software that one might use to implement the process is not part of the invention" (Br6) and acknowledge "that the steps of the method need not be 'performed' on a computer" (Br6). It is argued that while some steps could be done with a computer, or aided by the use of a computer, they need not be (Br7).

This confirms that appellants do not intend to limit the claims to a machine implementation. Cf. In re Prater, 415 F.2d 1393, 162 USPQ 541 (1969) (the court held that process claim 9, which read on a mental process augmented by pencil and paper markings, which appellants acknowledged was not their invention, as well on as a machine implemented process, fails to comply with the requirement of §112, second paragraph, which requires "claims particularly pointing out and claiming the subject matter which the applicant regard as his invention"). The fact that the steps are not performed on a computer does not make the method nonstatutory. However, where, as here, no machine is claimed, there is no implied physical transformation of physical subject matter (e.g., electrical signals) from one state to another that would nominally indicate a statutory process (and invoke the State Street test).

Appellants argue that the Federal Circuit stated in AT&T that "[s]ince the claims at issue in this case are directed to a process in the first instance, a structural inquiry is unnecessary" and, thus, there is no requirement of a specific apparatus on which the process can be performed (Br8; RBr3).

It is true that process claims are not required to recite the means structure for performing the steps. Unlike claims written in means-plus-function lan-

guage, which require supporting structure in the written description, it is not necessary to inquire whether process steps are supported by physical structure in the specification. However, we contend that a "process" under § 101 must recite steps that transform physical subject matter and must recite more than the "abstract idea."

Appellants argue that the examiner has relied on outdated case law in support of the rejection (Br8-9). In particular, the examiner's reliance on Schrader is argued to be inappropriate because it uses the outdated Freeman-Walter-Abele test which focuses on the "physical limitations" requirement (Br8). It is argued (Br8) that the test for patentable subject matter is whether the end result of the claimed process is "useful, concrete and tangible." It is argued that Warmerdam does not apply because "the claimed method involves steps not directed to the solving of a mathematical equation or algorithm" (Br9).

We agree that the Freeman-Walter-Abele test in Schrader is no longer in vogue because it is no longer required to investigate whether a claim contains a mathematical algorithm. Although the examiner rejected the claims as nonstatutory subject matter, in part, because they "solve[] a purely mathematical problem" (FR4), our new ground of rejection is not based on the presence of mathematical algorithms, but focuses on the lack of a physical transformation and the lack of a practical application of the "abstract idea" of risk management in the claims as a whole. Nevertheless, we briefly comment on Schrader and Warmerdam. The court stated in AT&T that Schrader was because "[t]he focus of the court in Schrader was not on whether the mathematical

algorithm was applied in a practical manner since is ended its inquiry before looking to see if a useful, concrete, tangible result ensued," AT&T, 172 F. 3d at 1360, 50 USPQ2d at 1453. It is noted that Judge Plager authored both the AT&T and Schrader opinions. Schrader was to a nonmachine-implemented method of conducting an auction and Warmerdam was to a non-machine-implemented method for generating a data structure. It is not clear why the "practical application, i.e., 'a useful, concrete and tangible result'" test would necessarily be definitive in these situations since State Street and AT&T both involved transformation of data by a machine.

Appellants note that the examiner stated that the method was not drawn to the "technological arts" "because the specification does not disclose specific hardware or software" (Br9). It is argued that "[c]ase law has addressed the issue of whether or not an apparatus is required for a process to be in the "technological arts'" (Br9). It is urged (Br10) that "technological arts" is synonymous with "useful arts" as it appears in Article 1, Section 8 of the Constitution, citing Musgrave and Waldbaum, 457 F.2d 997, 173 USPQ 430 (CCPA 1972). Therefore, it is argued (Br10):

> One can therefore conclude that no special meaning need be given to the phrase "technological arts," a phrase that has been devised and defined by the courts, apart from the Constitutional requirement that an invention be in the "useful arts." It is clear from Musgrave that no apparatus need be specified for a process that can be carried out by a human without the aid of

> an apparatus, as can the present invention under appeal.

We agree with appellants that "technological arts" means "useful arts" as stated in the Constitution, and that apparatus is not required to be claimed in order for a method claim to be a "process" under § 101. The Board held in Lundgren that "technological arts" is not a separate and distinct test for statutory subject matter. Although commentators have read this as eliminating a "technology" requirement for patents, this is not what was stated or intended. "The 'technology' requirement implied by 'technological arts' is contained within the definitions of the statutory classes." Lundgren, 76 USPQ2d at 1430. All "machines, manufactures, or [man-made] compositions of matter" are things made by man and involve technology. Methods which recite a transformation of physical subject matter from one state or thing to another, and which do not fall within one of the exclusions for "laws of nature, physical phenomena, and abstract ideas" involve technology and are a "process" under § 101. In our opinion, the statement in Musgrave that a process that can be performed mentally or by a machine is statutory subject matter as long as it is in the "technological arts" has been implicitly overruled because it has never been adopted by the Supreme Court in Gottschalk v. Benson or subsequent cases, and the CCPA and the Federal Circuit have not continued to apply this line of reasoning. A method that is so broadly claimed that it reads on performing the steps mentally should be considered an "abstract idea."

Appellants argue that "[t]he claimed method is patentable because it produces a 'useful, concrete and tangible result'" (Br10). Appellants refer to the fol-

lowing statement in State Street, 149 F.3d at 1373, 47 USPQ2d at 1601:

> Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result" a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

It is argued that "even if the present claimed method only calculated 'first and second fixed rates' as it does in the steps (a) and (c), the method would be patentable, because the fixed rates would be considered a 'useful, concrete and tangible result' as was the share price in State Street [ ] (here, the fixed rates calculate represent a 'risk position')" (Br11).

Appellants fail to note that the holding in State Street is clearly limited to "transformation of data … by a machine." AT&T involved a machine-implemented process. Machines are physical things that nominally fall within the class of a "machine" in § 101, and machine-implemented methods inherently act on and transform physical subject matter, such as objects or electrical signals, and nominally fall within the definition of a "process" under § 101. No machine is required by the present claims. Until instructed otherwise, we interpret State Street and AT&T to address the "special case" of subject matter that nominally falls within § 101, a general purpose machine or machine-implemented process, but which is nonetheless unpatentable because the machine

performs an "abstract idea." A general purpose computer which merely performs a mathematical algorithm (one type of abstract idea) on data, where the data is not representative of physical activity or objects, does not produce a "useful, concrete and tangible result."

Appellants argue that the present method goes much further than merely applying a mathematical algorithm (which first appears in independent claim 4) to calculate the first and second fixed rates, and the calculations are only part of the overall process (Br11). It is argued (Br11): "The 'practical application' of the mathematical algorithm in this case is the transactions that are set up using the fixed rates as price points, thereby creating a 'risk position' which minimizes the risk involved with the fluctuation of the price of a commodity for both the buyer and the seller of the commodity." It is further argued (Br11-12):

> The overall method also provides a result that is "useful, concrete and tangible." The provision of energy in a cost-efficient manner for all parties involved has value to society in general, and is therefore "useful." Based on the risk positions established by the method disclosed in the application, various parties, including end users, utility companies and resource suppliers are risking real money: therefore, the result is "tangible" and "concrete."

It is argued that the test for statutory subject matter is set forth in *AT&T*, and "[w]ith respect to process, and especially processes involving mathematical algorithms, the result was whether or not a 'useful, concrete and tangible result' ensued from the applica-

tion of the process" (RBr3). It is further argued (RBr3):

> In this case, execution of the process results in the calculation of first and second fixed rates for the buying and selling of commodities, specifically, energy commodities. These fixed rates represent a "risk position." The rates are used by a commodity broker to establish buy/sell positions with both end users and suppliers of the commodity, with the risk for the established positions balancing each other. This is a "useful, concrete and tangible result" and, as a result, the Appellants submit that the process is statutory subject matter.

The present rejection does not rely on the presence of a mathematical algorithm. Claim 1 does not appear to directly or indirectly recite a mathematical algorithm. The Federal Circuit has said that the Freeman-Walter-Abele test is of little value, so there is no longer any need to investigate the presence of a mathematical algorithm. The holding in State Street is limited to the context of "transformation of data … by a machine" and AT&T involved a machine-implemented process. Thus, it does not appear that the "useful, concrete and tangible result" test applies in the present situation. To the extent the "useful, concrete and tangible result" test is generally applicable, appellants' arguments indicate the difficulty in applying terms that have never been defined. We conclude that a "concrete and tangible result" requires a transformation of physical subject matter and/or evidence that the subject matter is more than an "abstract idea." None of the claims recites a transformation of physical subject matter and the

claims recite an "abstract idea" rather than a practical implementation of that idea.

Appellants argue that the examiner errs in applying the Guidelines for Computer-Related Inventions, MPEP § 2106 (which is based on the guidelines at 61 Fed. Reg. 7478, 1184 O.G. 87, see footnote 6), "because the Appellants have made it clear that a computer is not part of the invention" (RBr2). It is argued that the examiner erred in applying the standards from the Computer Guidelines and then concluding that "because there is no computer claimed [sic], that no practical application exists, and, as a result, the invention is not statutory" (RBr2).

We agree with appellants that the Computer Guidelines do not apply to the instant non-machine-implemented process claims. We also agree that it was incorrect for the examiner to determine generally that there can be no practical application of a process without a computer and that subject matter cannot be within the "technological arts" without a computer. The presence of a computer makes it much easier to find statutory subject matter, but a method can be statutory subject matter without a machine.

It is argued that "although several steps of the claimed process can be aided through the use of a computer, a computer is not necessary to implement the process" (RBr2) and "[t]herefore it is unclear whether the claimed invention should be considered a computer-related invention or not" (RBr2-3). Appellants argue that "assuming, arguendo, that the claimed invention can be considered a computer-related invention, … it is still statutory subject matter" (RBr3).

We agree with appellants that the claims are not directed to a computer-related invention, but obvi-

ously do not agree that the claims are directed to statutory subject matter.

Oral argument

At the oral argument, it was argued that the claims are presumptively directed to a "process" under § 101 because they recite a series of steps. It was argued that § 101 states that "any … process" is patentable, the statute must be interpreted broadly, and that any change in up to Congress.

As we have made clear throughout this opinion, we disagree. It was stated in State Street:

> The plain and unambiguous meaning of § 101 is that any invention falling within one of the four stated categories of statutory subject matter may be patented, provided it meets the other requirements for patentability set forth in Title 35, i.e., those found in §§ 102, 103, and 112, ¶ 2.
>
> The repetitive use of the expansive term "any" in § 101 shows Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101. Indeed, the Supreme Court has acknowledged that Congress intended § 101 to extend to "anything under the sun that is made by man." Thus, it is improper to read limitations into § 101 on the subject matter that may be patented where the legislative history indicates that Congress clearly did not intend such limitations.
>
> …
>
> The Supreme Court has identified three categories of subject matter that are unpatentable, namely "laws of nature, natural phenomena, and

> abstract ideas." [Footnotes and citations omitted.]

149 F.3d at 1372-73, 47 USPQ2d at 1600. This is not inconsistent with our position that not every series of steps is a "process" under § 101 because the Supreme Court's definition of a "process" requires a transformation of physical subject matter from one state to another. It would be helpful if the Federal Circuit would address this question directly. If every series of steps is presumptively a "process" under § 101, then it would be almost impossible to hold that such a claim is directed to nonstatutory subject matter because the "abstract idea" exclusion technically refers to subject matter that is not within § 101 (although case law suggests it can refer to subject matter that is within § 101 "but for" some special condition).

Appellants stated that the "rule of nature" and "natural phenomenon" exclusions do not apply, so the rejection must be based on the "abstract idea" exclusion. It was argued that Alappat, 33 F.3d at 1542 n.18, 31 USPQ2d at 1556 n.18, states that abstract ideas constitute disembodied concepts or truths that are not useful until reduced to some practical application. Applicants proposed that the test should be that any series of steps having a "real world effect" is a "process" under § 101, because a claim having a real world effect is not an abstract idea and is useful, and under such a test it would not be necessary to look at exceptions. It was argued that the transfer of commodities and the assumption of risk in the claims are real world effects.

It is not clear that adding another test would be useful: it is no easier to determine if there is a "real world effect" than it is to determine whether there is

a "practical application." It is hard to define the line between a patentable "practical application" (or "real world effect") and an unpatentable "abstract idea." In this case, the fact that the claims are so broad that they cover ("preempt") any and every way to perform the steps indicates that what is being claimed is the "abstract idea" itself. That is, the claims read as if they are describing the concept without saying how any of the steps would be specifically implemented to produce a "real world effect." In our opinion, the transformation of physical subject matter test is a more objective way to perform the § 101 analysis for nonmachine- implemented method claims.

For the reasons stated above, we conclude that appellants' oral arguments are not persuasive.

CONCLUSION

The rejection of claims 1-11 under 35 U.S.C. § 101 is sustained.

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

AFFIRMED

BOARD OF PATENT APPEALS AND INTERFERENCES

/s/ CHARLES E. FRANKFORT
Administrative Patent Judge

/s/ LEE E. BARRETT
Administrative Patent Judge

/s/ JENNIFER D. BAHR
Administrative Patent Judge

/s/ MARK NAGUMO
Administrative Patent Judge

CONCURRING OPINION

MCQUADE Administrative Patent Judge, concurring.

The quest for a bright line test for determining whether a claimed invention embodies statutory subject matter under 35 U.S.C. § 101 is an exercise in futility.

35 U.S.C. § 101 provides that "[w]hoever 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 conditions and requirements of this title." Congress intended this provision to encompass anything under the sun that is made by man. See Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980). Nonetheless, § 101 has limits and does not embrace every discovery within its statutory terms. Excluded from patent protection are laws of nature, physical phenomena and abstract ideas. See id.; see also Diamond v. Diehr, 450 U.S. 175, 185 (1981); Parker v. Flook, 437 U.S. 584, 589 (1978); and Gottschalk v. Benson, 409 U.S. 63, 67 (1972).

The proper inquiry requires a claim to be considered as a whole. See Flook, 437 U.S. at 594; Diehr, 450 U.S. at 188; AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1357, 50 USPQ2d 1447, 1451 (Fed. Cir. 1999); and In re Alappat, 33 F.3d 1526, 1543-44, 31 USPQ2d 1545, 1557 (Fed. Cir. 1994). The focus here should center on the essential characteristics of the claimed subject matter rather than on the particular statutory category to which the claim is nominally directed: process, machine, manufacture, or composition of matter. See State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1375, 47 USPQ2d 1596, 1602

(Fed. Cir. 1998). In this regard, undue weight should not be given to the sort of claim limitations that exalt form over substance and would allow a competent draftsman to mask non-statutory subject matter. See Flook, 437 U.S. at 590.

Hence, any assessment to determine whether a claim recites statutory subject matter should be fact-specific and conducted on a case-by-case basis. This approach, of course, does not easily lend itself to a test. The pointlessness of nevertheless attempting to settle on a test is exemplified by the tortured rise and sudden fall of the so-called Freeman-Walter-Abele test.[1] See AT&T, 172 F.3d at 1359, 50 USPQ2d at 1453, quoting State Street, 149 F.3d at 1374, 47 USPQ2d at 1601 ("After Diehr and Chakrabarty, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter"). Moreover, the Supreme Court has implicitly cautioned against reliance on tests in this area. See Benson, 409 U.S. at 71 ("We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.… It is said we freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology. Such is not our purpose."). Per se rules or tests, while arguably easy to apply, simply do not afford the flexibility needed to keep pace with new developments in technology and the law.

As for the merits of the present case, the appellants have not separately argued the patentability of any

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[1] This test evolved from the holding in In re Freeman, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978), as modified by In re Walter, 618 F.2d 758, 205 USPQ 397 (CCPA 1980), and further by In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA 1982).

claim apart from the others. Thus, claims 1-11 stand or fall together. See In re Young, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); and In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978). Claim 1, reproduced in the majority opinion, is representative.

Claim 1 recites a method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price. In other words, claim 1 pertains to a method of doing business.[2]

As pointed out in the majority opinion, the steps recited in claim 1

> do not recite any specific way of implementing the steps; do not expressly or impliedly recite any physical transformation of physical subject matter, tangible or intangible, from one state into another; do not recite any electrical, chemical, or mechanical acts or results; do not directly or indirectly recite transforming data by a mathematical or non-mathematical algorithm; are not required to be performed on a machine, such as a computer, either as claimed or disclosed; could be performed entirely by human beings; and do not involve making or using a machine, manufacture, or composition of matter [page 6, supra].

Considered collectively, these are powerfully persuasive factual indicators (not tests) that the method recited in claim 1 is, at its core, a disembodied

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[2] This, in and of itself, does not render the subject matter recited in claim 1 non-statutory. The so-called "business method" exception to statutory subject matter was ill-conceived and has been put to rest. See State Street, 149 F.3d at 1375, 47 USPQ2d at 1602.

business concept representing nothing more than a non-statutory abstract idea. That the "initiating" and "identifying" steps recited in the claim are drafted as acts required to be performed is of no moment. Given the full context of the claim, these acts are nominal in nature and merely serve to superficially couch the appellants' abstract idea in a method or process format.

For these reasons, the examiner's determination that claim 1, and claims 2-11, which stand or fall therewith, are directed to non-statutory subject matter under 35 U.S.C. § 101 is well founded.

BOARD OF PATENT APPEALS AND INTERFERENCES

/s/ JOHN P. McQUADE
Administrative Patent Judge