No. 2007-1130

IN THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

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

Petitioners.

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

BRIEF OF *AMICI CURIAE* DELL INC., MICROSOFT CORPORATION, AND SYMANTEC CORPORATION IN SUPPORT OF NEITHER PARTY

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CERTIFICATE OF INTEREST

Counsel for *Amici Curiae* certifies that following in compliance with Federal Circuit Rule 47.4:

1. The full name of every *amicus* represented by me is:

   Dell Inc.
   Microsoft Corporation
   Symantec Corporation

2. The names of the real parties in interest represented by me are:

   None.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the *amici curiae* represented by me are:

   None.

4. ⊗ There is no such corporation as listed in paragraph 3.

5. The names of all law firms and the partners or associates that appeared for the *amici* now represented by me in the trial court or agency or are expected to appear in this Court are:

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STATEMENT OF INTEREST OF *AMICI CURIAE*

Amici Curiae Dell Inc., Microsoft Corporation, and Symantec Corporation are leading computer, information technology, and software companies. Although their interests with respect to many legal questions diverge, *Amici* join in urging this Court to adopt a standard for determining whether process inventions satisfy 35 U.S.C. § 101, which will give meaning and effect to the statutory language and provide needed guidance to the Patent and Trademark Office, the lower courts, and the patent bar.

Amici both own process patents and are frequently defendants in suits alleging infringement of such patents owned by others. They thus have a profound interest in the standard that governs whether such patents claim patent-eligible subject matter. They also have an interest in the patent system as a whole and in the harm done to that system by the issuance of patents that claim nothing more than abstract concepts. By requiring that process inventions, like machines, manufactures, and compositions of matter, must be physical in nature and must produce a result that has specific practical utility — a result that is, in this Court's words, "useful, concrete and tangible" — this Court can restore proper balance to the system and provide guidance to the courts, the PTO, the bar, and the public.

INTRODUCTION

The Bilski patent application claims a process — specifically, "a method for managing the consumption risk costs of a commodity." The claimed process neither requires the use of a machine or other apparatus, nor effects a transformation of physical subject matter into a different state or thing. The claimed process is, however, arguably useful, with practical, real-world applications. The question before the Court, then, is whether such a process, unbounded by any physical limitations but with practical utility, is a *patentable* process within the meaning of 35 U.S.C. § 101.

It is not. In the trilogy of *Benson*, *Flook*, and *Diehr*, the Supreme Court set out the principles that govern whether a process claim describes patent-eligible subject matter under Section 101. Those principles require that, to be eligible for patenting, a process must be more than merely an abstract idea or concept, even if it unquestionably is a useful abstract idea or concept. Rather, a *patentable* process must make use of or operate upon something physical, be it uncured rubber, or electrical circuitry, or signals made up of electrons or photons or electromagnetic impulses. This requirement is apparent in the Supreme Court's repeated direction that a "process" within the meaning of Section 101 must be tied to a specific apparatus or must effect the transformation or reduction of subject matter to a different state or thing. Although the Supreme Court has never

attempted an exhaustive articulation of how to demonstrate that a process claim defines non-abstract, patent-eligible subject matter, it also has never suggested that a physical foundation is unnecessary. This understanding of "process" as tied to something fundamentally physical in nature places process inventions on the same footing as the other Section 101 categories — machine, manufacture, composition of matter — all of which are physical by definition.

These principles are easily applied to the process claims at issue here, which can be construed to consist of nothing more than "mental steps" that neither effect a transformation of physical subject matter nor are tied to a specific apparatus. Such "mental steps," divorced from any physical foundation, do not constitute a patentable process. In contrast, when a series of steps is tied to a particular apparatus or effects a transformation of physical subject matter, and produces a useful, concrete and tangible result, a patent-eligible invention under Section 101 has been claimed. As applied to software-related inventions, these fundamental principles lead to the following conclusions:

- Computer-implemented processes that produce useful, concrete, and tangible results are patent-eligible subject matter for at least two reasons: (1) they are tied to the use of a specific apparatus — a programmed computer, and (2) they effect a physical transformation, specifically, the transformation of physical subject matter (*e.g*, electrical or electromagnetic signals) into different physical subject matter.

- A computer that has been programmed to implement particular software instructions is itself patent-eligible subject matter, *i.e.*, a machine. It has distinct physical properties relative to an unprogrammed, or differently programmed, computer.

- This does not mean that an unpatentable abstract idea can become patentable merely by reciting that a computer should be used. Although such a recital may satisfy Section 101, that is only the first step on the road to a patent. Concerns with respect to the patentability of claims that include only general references to a computer or other apparatus are properly addressed not by engrafting unwritten requirements onto Section 101, but rather by rigorously enforcing Sections 102, 103, and 112.

By making clear that patent-eligible processes must be physical, this Court can rationalize seemingly inconsistent precedent, subject process inventions to the same fundamental requirement that applies to machines, manufactures, and compositions of matter, and provide the PTO, the lower courts, and the public with a standard that will enable them to determine which inventions satisfy the Section 101 threshold, and which do not.

DISCUSSION

I. BASIC PRINCIPLES GOVERNING APPLICATION OF SECTION 101.

A. The Statute And Early Precedent.

The Constitution's Patent Clause empowers Congress to "promote the Progress of Science and the Useful Arts.…" U.S. Const. Art. 1, § 8. Congress has implemented this grant in Section 101 by identifying certain subject matter, the

invention or discovery of which may merit a patent: "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 terms used in Section 101 have been used for over 200 years — since the beginning of the American patent system — to define the scope of patent-eligible subject matter. *See In re Chatfield*, 545 F.2d 152, 159 (CCPA 1976) (Rich, J., dissenting); 1 D. Chisum, *Patents* § 1.01 (1993).

Thus, the Patent Act of 1793 defined statutory subject matter as "any new and useful art, machine, manufacture or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, ch. 11, § 1, 1 Stat. 318. Although "process" did not appear in the statute until 1952, it is settled that this change in language was not a change in substance, for the original statutory term, "art," encompassed processes. *See Diamond v. Diehr*, 450 U.S. 175, 182 (1981). What qualified as a patent-eligible "art" or process is also settled. As the Supreme Court explained in *Diehr*, "the nature of a patentable process" had been "defin[ed]" over 100 years earlier: "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…." *Diehr*, 450 U.S. at 183, *quoting Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877).

To be sure, Section 101's description of patent-eligible subject matter is broad, intended by Congress to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952), *reprinted in* 1952 USCCAN 2394, 2399. But it is also unquestionably not without boundaries. *See Diehr*, 450 U.S. at 185 ("[E]very discovery is *not* embraced within the statutory terms.") (emphasis added). Most fundamentally, patent-eligible subject matter cannot be abstract. Thus, as early as *Le Roy v. Tatham*, 55 U.S. 156 (1852), the Supreme Court explained that "[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." *Id*. at 175. Since then, the principle that abstract ideas are unpatentable has repeatedly been confirmed. *See*, *e.g.*, *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874) ("An idea of itself is not patentable"); *Diehr*, 450 U.S. at 185; *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) ("The laws of nature, physical phenomena, and abstract ideas have been held not patentable."); *Parker v. Flook*, 437 U.S. 584, 589 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972).

From the text of the statute and the Supreme Court's consistent construction of that text, then, two prerequisites for patent-eligible subject matter can be discerned. First, a patent-eligible invention, whatever its form, is fundamentally physical — a machine, manufacture, composition of matter, or

process ("an act, or a series of acts, performed upon the subject-matter to be transformed …," *Cochrane*, 94 U.S. at 787-88). And, second, although a patent-eligible invention may not consist of an abstract idea, law of nature, or physical phenomenon, the *application* of an abstract idea, law of nature, or physical phenomenon to produce a new machine, manufacture, or composition of matter having a useful, concrete and tangible result may be patent-eligible.

B. These Fundamental Principles Continue to Apply in the Modern Electronic Age.

These principles, despite their age and their roots in the pre-electronic era, remain the touchstone for applying Section 101. The Supreme Court made this clear in *Diehr*, and its predecessors, *Benson* and *Flook*, all of which presented claims that involved, in one way or another, computer-related technology.[1] This Court, too, has recognized that *Benson*, *Flook*, and *Diehr* continue to provide the foundation for the Section 101 analysis, regardless of the technology or field of endeavor involved. *See*, *e.g.*, *In re Alappat*, 33 F.3d 1526, 1543-44 (Fed. Cir. 1994) (*en banc*); *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998); *In re Comiskey*, 499 F.3d 1365, 1375-76

[1] More recently, although the Supreme Court has not squarely confronted Section 101, several Justices have made clear that the Court's prior decisions continue to apply. *See Laboratory Corporation of America Holdings v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 2925-28 (2006) (Breyer, J. dissenting, joined by Stevens, J. and Souter, J.) (*citing Benson, et al.*).

(Fed. Cir. 2007); *In re Nuitjen*, 500 F.3d 1346, 1363-64 (Fed. Cir. 2007). As an examination of the controlling precedent makes clear, that Section 101 foundation is physical.

1. *Gottschalk v. Benson*

The applicant in *Benson* sought to patent "a method of programming a general-purpose digital computer." 409 U.S. at 65. The claims were not limited to any particular apparatus or end use, *id*. at 64, but their result — converting binary-coded decimals into pure binary numerals — was indisputably useful, *id*. at 65. The claims also described a "process," as ordinarily understood. *See Flook*, 437 U.S. at 588-89 (*Benson* claims described a "process").

They did not, however, describe a *patentable* process. The claims in *Benson* recited only "a generalized formulation for programs to solve mathematical problems of converting one form of numerical representation to another." 409 U.S. at 65. Although "programs may be developed as specific applications" from "the generic formulation" of the claims, *id*., Benson's claims did not purport to do so. Rather, they were "abstract and sweeping," *id*. at 68, and properly understood, sought "a patent on the algorithm itself." *Id*. at 71-72.

In this sense, the *Benson* claims suffered from the same defect as Samuel Morse's broad claim to any use of electromagnetism to produce signs for telegraphy, which the Court rejected in *O'Reilly v. Morse*, 50 U.S. 62 (1853). Just

as Morse's eighth claim sought to patent a fundamental principle without tying it to specific process steps or a specific apparatus, so too did the claims in *Benson* seek to patent an abstract idea, a mathematical algorithm. Morse, however, unlike Benson, also claimed specific physical process steps and an apparatus, which made his other claims patentable. *Id*. at 123. It was in this context that the Court in *Benson*, relying on its 19th Century precedents concerning "arts" or processes, explained that the "clue to patentability" of a process claim is that the process as claimed must be "tied to a particular machine or apparatus or must operate to change articles or materials to a 'different state or thing.'" 409 U.S. at 70-71. Although other such "clues" conceivably might exist, *id*. at 71, Benson's "abstract and sweeping" claims did not describe a patent-eligible process.

2. *Parker v. Flook*

The fundamental principles articulated in *Benson* were easily applied to the claims at issue in *Flook*. Those claims, according to the Supreme Court, provided only "a formula for computing an updated alarm limit," 437 U.S. at 586, a numerical parameter used in chemical processes. The Court assumed that the formula was useful, *id*. at 588, and it agreed that the claims literally described a "process," *id.* That "purely literal" definition, however, was not the definition contemplated by Section 101. *Id*.

In reaching this conclusion, the Supreme Court held, as it had in *Benson*, that a patent-eligible "process" is physical in nature — *i.e.*, "tied to a particular apparatus" or operating "to change materials to a 'different state or thing.'" *Id*. at 589, *quoting Cochrane*, 94 U.S. at 787-88. Although the *Flook* claims referred to particular catalytic conversion processes, they provided no disclosure of those process steps. *Id*. at 586. As the Court explained in *Diehr*, the *Flook* claims "did not purport to explain how the variables used in the formula were to be selected," 450 U.S. at 192 n.14, nor did they "contain any disclosure relating to the chemical processes at work, the monitoring of the process variables, or the means of setting off an alarm system." *Id*. at 187. The *Flook* claims also were not tied to any particular apparatus, either for implementing the claimed method itself or for the underlying chemical processes. *See* 437 U.S. at 596-97. The claimed invention was, in short, nothing more than an improved method of mathematical calculation — *i.e.*, an abstract idea and not the kind of process covered by Section 101. *Id*. at 593-95.

3. *Diamond v. Diehr*

The claims in *Diehr* were, on a superficial level, very similar to those in *Flook*: they described the use of a mathematical formula to improve the operation of an industrial process. The relevant teaching of *Diehr* emerges from consideration of the *differences* between the *Flook* and *Diehr* claims.

The key difference is that, unlike the claims in *Flook* (and *Benson*), the claims in *Diehr* described a step-by-step process for converting one physical substance, uncured rubber, into another, precision-cured rubber. They did not merely claim, as in *Benson*, an algorithm for converting one form of number into another, 450 U.S. at 185-86, nor did they claim, as in *Flook*, "'a formula for computing an updated alarm limit,'" *id.* at 187, *quoting Flook*, 437 U.S. at 586. Although the *Benson* and *Flook* inventions both could be put to practical use as parts of patentable processes, the claims themselves did not describe such processes. The *Diehr* claims did:

> That respondents' claims involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing cannot be disputed. The respondents' claims describe in detail a step-by-step method for accomplishing such, beginning with the loading of a mold with raw, uncured rubber and ending with the eventual opening of the press at the conclusion of the cure. Industrial processes such as this are the types which have historically been eligible to receive the protection of our patent laws.

450 U.S. at 184.

The mere fact that the *Diehr* process made use of a mathematical formula, and a computer, did not change the patent-eligible nature of the claimed process. The Court explained that although a formula or fundamental principle is not patentable "in isolation," "a novel and useful structure created with the aid" of that formula or principle satisfies the Section 101 threshold. *Id*. at 188, *quoting*

Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86, 94 (1939); *see also Diehr*, 450 U.S. at 192. The decisions in *Benson* and *Flook*, the Court explained, "stand for no more than these long-established principles." *Id*. at 185. Accordingly, a process that employs particular machines or effects the transformation of physical subject matter to a different state or thing is a "useful structure," and thus patent-eligible. *Id*. at 184, 192. And, although the Court again signaled, as it had in *Benson* and *Flook*, that "particular machines" or "transformation and reduction" may not be the only indicia of a patent-eligible process, *id*. at 192, the Court left no doubt that such a process is, like other Section 101 subject matter, physical in nature.

4. This Court's Application of *Benson*, *Flook*, and *Diehr*.

This Court consistently has applied these principles since the decisions in *Benson*, *Flook*, and *Diehr*. This is evident, for example, in decisions rejecting claims to processes that consisted entirely of so-called "mental steps." Thus, in *In re Schrader*, 22 F.3d 290 (Fed. Cir. 1994), this Court held unpatentable a "method constitut[ing] a novel way of conducting auctions" by allowing competitive bidding on a plurality of related items. *Id*. at 291. The fact that the process utilized machines was not determinative. Two of the alleged machines — a "display" in the front of the auction room and "a closed-circuit television system" for bidders in different cities — were not claimed, and the third — a "record" in

which bids could be entered — did not perform any particular function, and could have been "a piece of paper or a chalkboard." *Id*. at 293-94. The patent, therefore, impermissibly claimed a series of "mental steps."

Similarly, in *In re Warmerdam*, 33 F.3d 1354 (Fed. Cir. 1994), a process for controlling objects to avoid collisions was unpatentable because the claims described "nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea.'" *Id.* at 1360. A machine was not required, *id*. at 1358,[2] nor did the process transform any physical subject matter. *See also In re Meyer*, 688 F.2d 789, 795-96 (CCPA 1982) ("a mental process that a neurologist should follow" held not patentable because "not limited to any otherwise statutory process, machine, manufacture, or composition of matter."); *In re Maucorps*, 609 F.2d 481, 486 (CCPA 1979) (invention "directed toward optimizing the organization of sales representatives" held unpatentable).

Most recently, in *In re Comiskey*, the Court held that claims to an arbitration method that required no apparatus and did not describe "a process of manufacture or a process for the alteration of a composition of matter," 499 F.3d at 1379, are not patent-eligible under Section 101. The claims essentially sought to

[2] Indeed, underscoring that patent-eligible subject matter must be physical, the Court held that Warmerdam's Claim 5 was a claim to "a machine," and thus "is clearly patentable subject matter." 33 F.3d at 1360. Claim 5 simply claimed "A machine having a memory which contains data representing a bubble hierarchy generated by the method of any of Claims 1 through 4." *Id*. at 1358.

patent "the use of mental processes to resolve a legal dispute." They were, like the claims in *Schrader*, "directed to an abstract idea itself rather than a statutory category" of patentable subject matter. *Id*.

The requirement that a patentable invention have a physical foundation is evident as well in this Court's decisions approving claims that involved, in some fashion, mathematical algorithms, abstract concepts, or fundamental principles. In *Arrhythmia Res. Tech., Inc. v. Coranozix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), the Court considered a patent on a process and apparatus "for detecting and analyzing a specific heart activity signal…." *Id*. at 1058. The defendant argued that the claims were unpatentable because they embodied an abstract process or mathematical algorithm. The Court rejected that characterization because the claimed process physically transformed electrical signals generated by a particular apparatus. As the Court explained, the "claimed steps of 'converting,' 'applying,' 'determining,' and 'comparing' are physical process steps that transform one physical, electrical signal into another." *Id*. at 1059. This process involving physical subject matter satisfied Section 101.

The Court has applied the same analysis to machine or apparatus claims. In *Alappat*, the applicant claimed a machine, a "rasterizer," which employed circuits configured using mathematical algorithms to transform a waveform for display in an oscilloscope. The Court had little difficulty concluding

that an electrical apparatus configured to transform particular electronic signals into different signals was a "machine" under Section 101, and the fact that its circuits were configured using mathematical concepts did not remove it from Section 101's coverage. 33 F.3d at 1544-45. Moreover, because the claimed machine produced a "useful, concrete, and tangible result," it could not be said (as was true in *Benson*) that the claims effectively claimed only an abstract concept. It was patent-eligible subject matter under Section 101. *Id*. at 1544.

To the same effect is *State Street Bank*. The claims there described a machine, in means-plus-function form, and the specification disclosed the requisite structure. 149 F.3d at 1371. A "machine," consisting of specific physical components, is Section 101 subject matter. *Id*. at 1372. It was true, as in *Alappat*, that the claimed machine made use of mathematical operations. *Id*. It was undisputed, however, that the machine produced, as in *Alappat*, a "useful, concrete, and tangible result." *Id*. at 1375. The claimed invention, therefore, was not "merely abstract ideas constituting disembodied concepts or truths," *id*. at 1373. It complied with Section 101.

* * *

The governing principles are clear. The range of patent-eligible subject matter is very broad, but it is not unlimited. Among other limitations, it does not include abstract concepts. To be patent-eligible under Section 101, an

invention — whether process, machine, manufacture, or composition of matter — must be physical in nature; where a process is concerned, this means that the claimed steps must be tied to a particular apparatus or effect a transformation of physical subject matter. Moreover, to ensure that a claim to what appears to be patent-eligible subject matter is not in reality a claim to an abstract concept, the claimed invention must produce a "useful, concrete and tangible result."

II. APPLICATION OF THE SECTION 101 PRINCIPLES.

Measured against these principles, the Bilski claims plainly do not describe patent-eligible subject matter. The claimed invention, although it may have some practical utility, encompasses an abstract concept. It is neither tied to a particular apparatus, nor does it transform physical subject matter. It is thus indistinguishable from the inventions in *Flook*, *Schrader*, *Comiskey*, and other cases which involved arguably useful concepts where the claims when properly construed were wholly lacking in physical substance.

This Court's decision, however, will have significance far beyond Bilski's claim to a method for managing risk, for the principles that govern what is patent-eligible subject matter under Section 101 apply to all inventions, regardless of form, and all technologies, regardless of field. In particular, this Court's decision is likely to have direct application to information technology-related

inventions, including those implemented in software, combinations of software and hardware, firmware, and other current and future formats.

With respect to an invention implemented in software, a patentable claim must include physical limitations — *i.e.*, it must effect a physical transformation of subject matter or be tied to a particular apparatus. Software-implemented processes do just that in that they are tied to a specially programmed computing device and effect a transformation of physical matter, such as electrical or electromagnetic signals. Before software can be contained in and continuously performed by a computer, an actual *physical* embodiment of the software must be delivered by CD-ROM or some other means capable of interfacing with a computer. *See Microsoft Corp. v. AT&T Corp.*, 127 S. Ct. 1746, 1756 (2007). This is in contrast to the concept of software detached from any physical embodiment or activating medium, which, at that basic level, is merely a set of instructions. *Id.* The way in which this Court draws the line between that which is sufficiently physical and useful to satisfy Section 101 and that which is a mere abstract concept thus will have direct application to the Section 101 analysis of claims that involve computer software. *Amici* therefore propose the following approach.

A. The Requirement of Section 101 That a Patent-Eligible Invention Be Physical Is Satisfied by Computer Software-Implemented Processes and Programmed Computers Operating Pursuant To Software Instructions.

That software-related inventions must have a physical foundation is the inescapable conclusion of *Benson*, *Flook*, and *Diehr*, and this Court's decisions in their wake. What that means at a practical level may be less clear, but *Amici* submit that the Supreme Court's analysis of computer-related process inventions and this Court's analysis of computer-related machine claims point to the answer.

As for process inventions, the "clues" to their patentability are well settled and directly applicable to software-implemented processes. At the most basic level, a classic industrial process, like the rubber-curing process in *Diehr*, that is implemented using computer software plainly "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)." 450 U.S. at 192. The use of a programmed computer in an otherwise patent-eligible process does not remove it from the coverage of Section 101. *Id*. at 187. Moreover, as this Court has made clear, the physical subject matter that undergoes a physical transformation can include electrical signals, electromagnetic signals, and the like. "[C]omputer-performed operations transform a particular input signal to a different output signal, in accordance with the internal structure of the computer as configured by electronic instructions." *Arrhythmia Research*, 958 F.2d at 1060. These operations

"convert[] one physical thing into another physical thing," *In re Sherwood*, 613 F.2d 809, 819 (CCPA 1980), *i.e.*, they perform "a function which the patent laws were designed to protect." *Diehr*, 450 U.S. at 192. *See also Nuitjen*, 500 F.3d at 1355 (a "signal made of electrical or electromagnetic variances … is physical and real."); *id.* at 1356 (an electric or electromagnetic transmission "is man-made and physical — it exists in the real world and has tangible causes and effects").[3] So long as the product of these physical operations is not a mathematical abstraction, but rather is of "practical utility and specified application," *Arrhythmia Research*, 958 F.2d at 1061 — which will typically be the case — the threshold requirements of Section 101 have been satisfied.

Consideration of the other "clue" to patentability — that a patent-eligible process be "tied to a particular machine or apparatus," *Benson*, 409 U.S. at 70-71 — leads to the same conclusion. A computer operating pursuant to software instructions is "a particular machine or apparatus" — in the words of

[3] That the subject matter on which a patentable process operates may include electrical and electromagnetic signals is a well-established principle, long predating computer-related technology. For example, Alexander Graham Bell's process of transmitting speech employed electricity, "one of the forces of nature…. The art consists in so controlling the force as to make it accomplish the purpose," which Bell did by "changing the intensity of a continuous electric current." *The Telephone Cases*, 126 U.S. 1, 532 (1888). *See also Corning v. Burden*, 15 How. 252, 267-68 (1854) (a patentable process may employ "some element or power of nature"); *Nuitjen*, 500 F.3d at 1368 (Linn, J. dissenting) (discussing approved process claim in *O'Reilly v. Morse*, which used electromagnetism).

Arrhythmia Research, its "internal structure" has been "configured by electronic instructions." 958 F.2d at 1060. Programming "creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Alappat*, 33 F.3d at 1545; *see also Aristocrat Techs. Australia Pty. Ltd. v. Intl. Game Tech.*, No. 2007-1419, slip op. at 8 (Fed. Cir. March 28, 2008).[4] The fact that the program software, divorced from the computer or other physical medium, might be termed an algorithm or might incorporate mathematical concepts is irrelevant. All machines operate pursuant to algorithms, and computers are no different. Once the algorithm or software takes physical form as part of a computer (or other machine), Section 101 is satisfied, for "a computer … is apparatus, not mathematics." *Alappat*, 33 F.3d at 1545; *cf. Microsoft Corp. v. AT&T Corp.*, 127 S. Ct. at 1750 (machine within scope of patent's apparatus claim is created when computer is programmed with software).

The relevant Section 101 principles thus come down to this where computer software-related inventions are concerned: (1) A software-implemented

[4] This analysis rests on a solid technological foundation. When a program is installed on a computer, the program instructions change the machine's physical structure by aligning pairs of bands of magnetically-charged particles on the hard disk, with each pair corresponding to a "1" or "0" of the object code and causing one of the processor's internal switches to open or close. Ron White, *How Computers Work*, 144-45 (8th ed. 2006).

process is patent-eligible under Section 101 for two separate reasons — it effects a physical transformation of physical subject matter, *and* it is tied to a particular apparatus, the "special purpose" programmed computer; and (2) A programmed computer is itself patent-eligible subject matter under Section 101 because it is a new machine, having different physical properties relative to an unprogrammed or differently programmed computer.

B. The Court Should Make Clear That "Useful, Concrete and Tangible" Is Not An Independent Test Under Section 101.

Despite the clear precedent, it has been suggested that whether a process effects a physical transformation or is tied to a particular apparatus is beside the point, that the real test under Section 101 is simply whether a claimed process produces a "useful, concrete and tangible result."[5] *Amici* submit that this view rests on a misreading of this Court's decisions and that the *en banc* Court should dispel this misconception.

The cases in which the "useful, concrete and tangible" phrase originated — *Alappat*, *State Street*, and *AT&T Corp. v. Excel Comms., Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) — all involved claims with physical limitations that satisfied the essential requirement of Section 101 as articulated by the Supreme Court. As the Supreme Court also made clear, however, physical limitations do

[5] *See, e.g.*, Opening Brief of Appellants (March 12, 2007), at 10-11; Brief for *Amicus Curiae* AIPLA (April 30, 2007), at 13-15.

not necessarily satisfy Section 101, if the practical effect of allowing the claim, viewed as a whole, would be to grant patent rights on an abstract idea or fundamental principle. *See*, *e.g.*, *Diehr*, 450 U.S. at 191; *Flook*, 437 U.S. at 590; *Benson*, 409 U.S. at 72-73. Thus, where a process claim incorporates an abstract idea or fundamental principle, Section 101 requires confirmation that the claim is not simply a dressed-up version of that idea or principle — that is, does the claimed process, viewed as a whole, have specific, practical utility? *See*, *e.g.*, *Diehr*, 450 U.S. at 187. This Court's "useful, concrete and tangible" formulation is a useful analytical tool to confirm that an invention that is sufficiently physical in nature is indeed patent-eligible under Section 101. It does not, however, function as a stand-alone test or alternative to the requirement that a patent-eligible invention have a physical foundation. *See Nuitjen*, 500 F.3d at 1354 (*State Street* did *not* hold that the Section 101 inquiry is "subsumed into an overarching question about patentable utility.").[6]

[6] Confusion on this score has arisen, in part, because of the similarity of this inquiry to the independent Section 101 requirement that a claimed invention possess practical utility. *See Brenner v. Manson*, 383 U.S. 519, 528-29 (1966); *In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005) (patentable invention must have "real world value"). As the Supreme Court held in *Brenner*, "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion." 383 U.S. at 536. The practical utility requirement reflected in the "useful, concrete and tangible" inquiry operates to enforce this independent statutory requirement.

This is clear from *Alappat* and *State Street*, both of which first determined that the claims at issue presumptively described Section 101 subject matter — machines — and only then addressed the machines' "useful, concrete and tangible" output. *See Alappat*, 33 F.3d at 1544; *State Street*, 149 F.3d at 1373. It is clear as well from the myriad cases in which claimed inventions that produced useful results were nevertheless held unpatentable under Section 101 because they were "abstract" — *i.e.*, non-physical. *See, e.g.*, *Flook*, 437 U.S. at 590; *Benson*, 409 U.S. at 72-73; *Meyer*, 688 F.2d at 796; *Maucorps*, 609 F.2d at 486; *Comiskey*, 499 F.3d at 1375-76. To the extent that confusion exists on this score, it may flow from *AT&T v. Excel* and its suggestion that physical limitations are irrelevant when process claims are at issue. 172 F.3d at 1358. But the claims there in fact included physical limitations, requiring "the use of computers and switches," *id*. at 1355, and called for processing "through switching and recording mechanisms to create a signal useful for billing purposes," *id*. at 1358. As this Court explained in *Comiskey*, the *Excel* process claims satisfied Section 101 "because they claimed practical applications *and* were tied to specific machines." 499 F.3d at 1377 & n.14 (emphasis added). The question whether a process can be patented in the absence of physical limitations therefore was not presented in *Excel*, so any suggestion that such limitations are not required is not only contrary to controlling precedent, but also is *dictum*.

C. Concerns With Respect To Claims That Include Only General Recitations of Structure Are Properly Addressed Under Sections 102, 103, and 112, not Section 101.

The approach outlined above is subject to the criticism that its requirements can be easily circumvented, that an abstract series of steps can be converted into Section 101 subject matter merely by reciting, for example, that the steps should be implemented using a computer, and that a more stringent Section 101 standard is necessary. This criticism is not without substance, for it is indeed a simple matter to add "implemented by computer" to almost any otherwise abstract concept. The solution, however, lies not with Section 101 but with the other statutory requirements for patentability.

Section 101, as the Supreme Court reminded in *Diehr*, is only one doorway of several through which a claimed invention must pass on the way to a patent. It is "a general statement of the type of subject matter that is eligible for patent protection," subject to the other requirements of the statute. 450 U.S. at 189. The bedrock principle that a court should not read into a statute limitations that Congress did not adopt is of particular relevance to Section 101, for both its text and its legislative history make clear that Congress intended a broad scope. *See Diehr*, 450 U.S. at 182; *Chakrabarty*, 447 U.S. at 315. Indeed, much of the confusion in this area can likely be traced to the understandable desire to block unwarranted patents at the very first statutory threshold.

Amici respectfully submit that preventing the issuance of unwarranted patents is best achieved not by adding to Section 101 requirements not found in that general statute, but rather by rigorously enforcing the more specific requirements of Sections 102, 103, and 112 — novelty, nonobviousness, definiteness, written description, and enablement.

This Court reached just this conclusion in *In re Comiskey*. Several of the claims at issue there recited steps that involved no apparatus and no transformation of physical subject matter, while others explicitly required the use of a computer or other apparatus. 499 F.3d at 1376-78. The Court held that the former merely reflected mental processes, *i.e.*, abstract concepts, and thus did not satisfy Section 101. *Id*. at 1378. The claims requiring the use of an apparatus, however, were different because "[w]hen an unpatentable mental process is combined with a machine, the combination may produce patentable subject matter." *Id*. at 1379. The Court reached this conclusion even though these claims included only general language requiring the use of "the Internet, intranet, World Wide Web, … or other communication means." *Id*. at 1369-70. The Court noted that the "routine addition of modern electronics to an otherwise unpatentable invention typically creates a prima facie case of obviousness," but determined that this was a Section 103, not Section 101, issue. *Id*. at 1380.

Section 112 is another tool for ensuring that claims that merely add general recitations of structure to otherwise unpatentable subject matter do not mature into issued patents. Indeed, this Court has particular experience in applying Section 112 to claims that call for the use of computer devices, particularly claims in means-plus-function or step-plus-function form. In such cases, "this court has consistently required that the structure described in the specification be more than simply a general purpose computer or microprocessor." *Aristocrat Techs.*, slip op. at 7. Instead, Section 112 requires that such claims be supported by disclosure of specific structure or specific steps that will produce the claimed result, not merely by a general reference to a computer or microprocessor, as in *Comiskey*. *See, e.g.*, *id*., slip op. at 7-12; *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1249 (Fed. Cir. 2005); *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). If the specification fails to provide this disclosure, the claim is invalid. *See Aristocrat Techs.*, slip op. at 4, 7-16 (disclosure of "a standard microprocessor-based gaming machine with 'appropriate programming'" is not sufficient); *see also Tehrani v. Hamilton Med., Inc.*, 331 F.3d 1355, 1362 (Fed. Cir. 2003); *WMS Gaming*, 184 F.3d at 1358.

Amici submit that concerns with overly broad or vague "machine-implemented" claims are best addressed by enforcing Section 112 as applied in these decisions, and Section 103 as suggested in *Comiskey*. To use Section 101 for

this purpose distorts its language and purpose, and produces uncertainty concerning its proper scope. Congress has provided the tools necessary to prevent abuse of the patent system, and those tools are, as the Supreme Court explained in *Diehr*, the "specific conditions for patentability" of Sections 102, 103, and 112. 450 U.S. at 189.

III. ANSWERS TO THE COURT'S SPECIFIC QUESTIONS.

Based on this analysis, *Amici*'s answers to the Court's specific questions can be briefly stated:

1. *Whether Claim 1 of the Bilski application claims patent-eligible subject matter under Section 101?*: No. As "a method of managing the consumption risk costs associated with a commodity sold at a fixed price for a given period," Claim 1's process does not effect a transformation of physical subject matter, nor is it tied to a specific apparatus. Therefore, it falls outside the scope of Section 101.

2. *What standard should govern in determining whether a process is patent-eligible subject matter under Section 101?*: As *Benson, Flook*, and *Diehr* make clear, and as this Court observed in *Alappat* and, most recently, *Comiskey*, a process, for purposes of Section 101, must be physical — that is, it must be tied to particular apparatus or effect a transformation of physical subject matter — and it must produce a useful, concrete and tangible result.

3. a. *Whether the claimed subject matter is not patent-eligible because it constitutes an abstract idea or mental process?*: It is not patent-eligible because it is not a process under Section 101 — it neither transforms physical subject matter, nor is it tied to a specific apparatus. A "process" that lacks such a physical foundation is an unpatentable abstract concept.

3. b. *When does a claim that contains both mental and physical steps create patent-eligible subject matter?*: A process claim is eligible for patent protection when the claimed process as a whole physically transforms physical subject matter or is tied to specific machines, and the result of the process is useful, concrete and tangible.

4. *Whether a 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?*: Patentability under Section 101 requires that a claimed invention be physical. Machines, manufactures, and compositions of matter are inherently physical; a "process," literally defined, is not. The Supreme Court has made clear, however, that the requirement that a patent-eligible invention be physical also applies to processes. Although other means of demonstrating that a process is physical in character are not foreclosed, the only means recognized thus far by the Supreme Court are that a process result in a transformation of the physical properties of specific physical subject matter or be tied to a specific apparatus.

5. *Whether it is appropriate to reconsider the State Street Bank and AT&T v. Excel decisions, and if so, whether those cases should be overruled in any respect?*: The outcome in both cases is consistent with the correct standard for patentability, so neither case need be overruled. Both cases, however, contain language that can be, and has been, read to relax patentability standards beyond what can be justified consistent with Supreme Court precedent — in particular, the "useful, concrete and tangible" result formulation. *State Street*, 149 F.3d at 1375-76; *Excel*, 172 F.3d at 1355. The *en banc* Court should make clear that this is not an independent patentability standard but rather is only a part of the Section 101 inquiry.

CONCLUSION

Amici Curiae respectfully submit that the Court should embrace the following principles to determine whether process inventions qualify as patent-eligible subject matter under Section 101:

- A patent-eligible process must be physical in nature — *e.g.*, it must be tied to a specific apparatus or effect a physical transformation of physical subject matter.
- Physical subject matter includes electrical and electromagnetic signals.
- The result or product of such a physical process must be useful, concrete and tangible. However, such a result is not itself sufficient for patentability. A patent-eligible process must *both* be physical in nature and must produce a useful, concrete and tangible result.

Amici submit that this standard properly implements Section 101 as a broad, but not unlimited, patentability threshold, and will enable the PTO, the courts, and the bar to determine whether Section 101 has been satisfied in a particular case, whatever the form of the claimed invention, the technology employed, or the field of endeavor.

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CERTIFICATE OF COMPLIANCE WITH FRAP 29(d) AND 32(a)(7)(B)

Counsel for *Amici* certifies that the body of this brief, beginning with the Statement of Interest of *Amici Curiae* on page 1 and ending with the last line of the "Conclusion" on page 30, contains 6,972 words, as measured by the word-processing system used to prepare this brief, in compliance with Federal Rules of Appellate Procedure 29(d) and 32(a)(7)(B).

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CERTIFICATE OF SERVICE

I hereby certify that on the 7th day of April 2008, two copies of the foregoing Brief of *Amici Curiae* were served upon:

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