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

IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

In re BERNARD L. BILSKI and RAND A. WARSAW

Appellants.

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

BRIEF OF AMICI CURIAE YAHOO! INC. AND PROFESSOR ROBERT P. MERGES IN SUPPORT OF APPELLEE

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April 7, 2008

CERTIFICATE OF INTEREST

Pursuant to Fed. Cir. R. 47.4, counsel for amici curiae Yahoo! Inc. and Professor Robert P. Merges certifies the following:

1. The full name of every party or amicus represented by us is: Yahoo! Inc. and Robert P. Merges.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by us is: Not applicable.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by us are: Not applicable.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by us in the trial court or agency or are expected to appear in this court are: Harris, Wiltshire & Grannis LLP; Christopher J. Wright, Timothy J. Simeone, and Joseph C. Cavender.

April 7, 2008.

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Christopher J. Wright

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STATEMENT OF INTEREST

Yahoo! Inc. ("Yahoo!") provides services to approximately 500 million individuals each month worldwide and operates one of the world's most trafficked Internet destinations. Yahoo! is a leading innovator in the Internet, computer, and communications sectors, with a broad portfolio of patents relating to Internet technologies, products, and services. It relies on the patent system to protect its intellectual property and to enable it to invest millions of dollars in developing new technology. Yahoo! is also concerned about the danger of an excessive proliferation of patents that do not represent real technological innovation. Inappropriately granted patents increase costs to other innovators in many respects, from increased search costs, to increased costs associated with designing around patents, to litigation costs. Accordingly, Yahoo!'s interest is in a patent system that provides fair protection for real technological innovation.

Professor Robert Merges is the Wilson Sonsini Goodrich & Rosati Professor of Law & Technology at the University of California, Berkeley, School of Law (Boalt Hall). He has written extensively on a wide range of intellectual property topics, focusing on issues relating to modern technology. He joins this brief in his individual capacity and not as a representative of the University of California.

INTRODUCTION AND SUMMARY OF ARGUMENT

At the heart of this case is the question what standard should apply to determining whether a method or process qualifies as patent-eligible subject matter under Section 101 of the Patent Act. *Amici* submit this brief because, while each side of this dispute urges an approach to analyzing patent eligibility that it contends resolves this case, neither side advances a rule that is fully satisfying in the run of cases -- particularly the most difficult cases. Moreover, the rules advanced by both sides fail to take account of important aspects of Supreme Court and Federal Circuit jurisprudence on patent eligibility, and are ill-adapted to the ever-increasing pace of technological change in the American and world economies.

Appellant argues that any process that produces "a useful, concrete, and tangible result" is patentable, relying primarily on this Court's decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998). App. Supp. Br. 4-11. This test, however, gives insufficient weight to the Supreme Court's efforts to impose meaningful bounds on Section 101, including the Court's categorical exclusion of abstract ideas from the realm of patent eligibility. *See, e.g., Diamond v. Diehr*, 450 U.S. 175, 185 (1980); *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874).

Appellee suggests that Supreme Court precedents have recognized processes as within the statutory definition only when they were either tied to a particular

apparatus or operated to change materials to a "different state or thing." PTO Supp. Br. 6-14. In the context of today's advanced technologies, however, strict judicial efforts to identify a "particular apparatus" or a "change in materials" risk elevating form over substance. For sophisticated software applications, for example, the line between an apparatus and a process is indistinct at best -- technically skilled persons can often implement a desired series of functions in either "hardware" (*e.g.*, a computer chip) or "software" (*e.g.*, electronically encoded instructions for a computer). Similarly, at the level of electronic signals and magnetic impulses, some may find the inquiry into whether there has been change of materials to a "different state or thing" unsatisfying. Indeed, this Court's focus on *results* in cases like *State Street* and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) -- rather than on whether a process was machine implemented or involved a physical transformation -- stemmed from the fact that the more traditional inquiries were a poor fit in the technological contexts of those cases.

The PTO and some *amici* nonetheless urge this Court to dispose of the claims in this case by deeming machine implementation or physical transformation to be an absolute requirement of Section 101, although the Supreme Court has more than once explicitly refused to endorse such an approach. As further explained below, however, this seemingly straightforward approach may lead to

the unintended consequence of foreclosing patent eligibility for worthwhile inventions involving new, innovative processes. Rather than turning back the clock, this Court should preserve the core insight of *State Street* and *Excel* that a narrow focus on physicality requirements is not well suited to the electronic age. The Court should integrate the analysis in those cases with Supreme Court precedent to articulate a flexible but disciplined and forward-looking test that will enable the PTO, the lower federal courts, and the patent bar to meaningfully distinguish unpatentable abstract ideas from patent-eligible processes.

The decisions of this Court and the Supreme Court provide a firm foundation for such a standard. First, it is certainly true that a patent-eligible process must produce "a useful, concrete, and tangible result." *State Street*, 149 F.3d at 1373. But Supreme Court precedent makes clear that an analysis focused solely on the *result* is not sufficient to fully assess patent eligibility. The Supreme Court's decisions indicate that, in addition to producing a "useful, concrete, and tangible result," the *process* itself must be stable, predictable, and reproducible. *See, e.g.*, *Diehr*, 450 U.S. at 184-87 (finding claims setting forth "in detail a step-by-step method" for accomplishing a specific, unvarying result to describe patent-eligible subject matter even though representing an application of an abstract mathematical formula). Thus, while a process need not necessarily be completely

machine-implemented, it must be defined with enough specificity so that it can be regularly performed—it must, in a word, be "machine-like."

In sum, under the precedents of this Court and the Supreme Court, any process involving abstract concepts should be deemed patent eligible only when (1) the claim sets forth clearly defined steps permitting a result to be reached in a way that is stable, predictable, and regularly reproducible; and (2) it produces a result that is "useful, concrete, and tangible." Appellants' claim 1 does not satisfy this test. The implementing steps of the claim are insufficiently defined and, as a result, no stable, predictable, reproducible result could be achieved by following those steps. The decision of the Board of Patent Appeals and Interferences should be affirmed.

ARGUMENT

I. A STANDARD ANALYZING BOTH WHETHER CLAIMS SET FORTH A PROCESS THAT IS STABLE, PREDICTABLE, AND REPRODUCIBLE *AND* WHETHER THE RESULT IS "USEFUL, CONCRETE, AND TANGIBLE" HARMONIZES THE DECISIONS OF THIS COURT AND THE SUPREME COURT AND IS APPROPRIATE FOR TODAY'S ADVANCED TECHNOLOGIES.

A. Patent Eligibility for Processes Is Not Limited to Those Implemented by a "Particular Apparatus" or Resulting in Transformation to a "Different State or Thing."

The Patent Act authorizes patents for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement

thereof." 35 U.S.C. § 101. The Act further defines a process as a "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).

While Section 101 sweeps broadly, the Supreme Court has recognized that it is not without limits. Laws of nature, physical phenomena, and abstract ideas are not patentable. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980). These exceptions, however, are narrow. For example, while a newly discovered wild plant is not patentable subject matter, a man-made organism is. *See id*. at 309-10. Likewise, while ideas are not patentable, a concrete application of an idea to a practical problem is the essence of invention. *Cf. Diehr*, 450 U.S. at 189 n.12 ("[A]ll [patentable] inventions can be reduced to [unpatentable] underlying principles of nature.").

Despite Congress's desire to protect a wide range of subject matter, *see* S. Rep No. 1979, 82d Cong., 2d Sess., 5 (1952) (citing "anything under the sun that is made by man" as patentable subject matter), the PTO advances a cramped view of what qualifies as patent eligible subject matter. The PTO's Supplemental Brief contains a heading claiming that "a Section 101 'process' must either be tied to a particular apparatus or transform an article to a different state or thing." PTO Supp. Br. 6. As the PTO itself appears later to acknowledge, however (*see id*. at 8-9), the Supreme Court has never found Section 101 to be so limited. To the

contrary, in *Gottschalk v. Benson*, 409 U.S. 63 (1972), the Court expressly rejected this position:

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

Id. at 71. The Court then explained that it "is not our purpose" to "freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology." *Id.* Almost a decade later, the Court reaffirmed this intent in *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978):

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

Benson and *Flook* thus reflect the Supreme Court's view that patent eligibility analysis must be flexible enough to take account of "new, onrushing technology."

The Supreme Court's most recent decision addressing the scope of patentable subject matter, *Diehr*, is consistent with that core principle. In that case, the Court held that "when 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. *Diehr* thus notes "transforming or reducing an article to a different state or thing" as *examples* of functions the patents laws are meant to protect, but does not impose any rigid formula *limiting* patentability to such circumstances. To the contrary, *Diehr* indicates that for claims involving an abstract formula or concept the focus should be on whether that formula is claimed as part of the kind of "structure or process" that the patent laws are designed to protect. *See also id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

B. Consistent with the Supreme Court's Desire not to "Freeze" Patent Eligibility, this Court's Cases Have Properly Rejected a Strict Focus on Physicality in the Context of New Technologies.

In *Benson* and *Flook*, the Supreme Court indicated that patent eligibility analysis must take account of advances in technology. Such advances have of course occurred. In particular, in a world in which the line between "machines" (hardware executing software) and "processes" (software, as executed) has become increasingly blurred, an analysis focused on whether a process is machine-implemented becomes both more difficult to perform and less meaningful. Similarly, when the physical transformations involved in a claimed process are

transformations of electronic signals, an inquiry into whether a physical transformation has taken place may be less probative than in more material contexts.

This Court has, however, been obliged to address the patent eligibility of "new, onrushing technology" against the backdrop of Supreme Court cases from a more corporeal age emphasizing physical structure. Accordingly, in *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), when this Court ruled on a claim involving a programmed computer that translated analog electrocardiograph signals into digital form, it found the fact that the mathematical algorithm was directed to a physical apparatus described in the patent specification significant. *Id.* at 1060-61. Two years later, in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994), this Court again sought a connection to a physical apparatus in determining whether Alappat's rasterizer -- a computer programmed to display waveform data in a way that smoothed out the effects of noise and other distractions -- was patentable subject matter. The Court determined that the programming that allowed the computer to act as a rasterizer effectively creates a new, patent-eligible machine. *Id.* at 1545.

This Court's decisions in *State Street* and *Excel*, however, took a somewhat different path. Responding to the fact that a patent-eligibility analysis focused on physical structures was analytically unsatisfying in an electronic age, the Court

focused on the results an invention would produce. Specifically, *State Street* found that "for the purposes of a 101 analysis, it is of little relevance whether [a patent's claim] is directed to a 'machine' or a 'process,' as long as it falls within at least one of the four enumerated categories of patentable subject matter." *State Street*, 149 F.3d at 1372. *State Street* further concluded that a process applying a mathematical algorithm is patentable if it produces a "useful, concrete and tangible result." The Court held that a claimed data processing system for managing investment accounts produced such a result: "a final share price momentarily fixed for recording and reporting purposes." *Id.* at 1373. The *Excel* decision reinforced *State Street*'s departure from the *Arrhythmia/Alappat* focus on physical structure. In rejecting Excel's argument that physical limitations must be set forth in the claims, this Court "focus[ed] on the inquiry deemed 'the ultimate issue' by *Alappat*," *Excel*, 172 F.3d at 1359 -- "whether the claim as a whole is drawn to statutory subject matter." *id.*

The core insight of *State Street* and *Excel* -- that a patent eligibility standard focusing solely on physicality requirements, developed in the context of claims for traditional electromechanical devices, is ill-adapted to today's technologies -- is a valuable one this Court should not abandon. As further set forth directly below, those cases, together with the relevant precedents of the Supreme Court, provide the foundation for a forward-looking test that will enable the PTO, the lower

federal courts, and the patent bar to meaningfully distinguish unpatentable abstract ideas from patent-eligible processes.

C. Looking Both at Whether the Patent Claims Set Forth a Process That is Stable, Predictable, and Reproducible and at Whether the Result is "Useful, Concrete, and Tangible" Best Harmonizes the Precedents of this Court and the Supreme Court.

As the discussion above suggests, the PTO's briefing in this case focuses too much on physicality requirements. While that focus may be convenient in resolving certain marginal cases, this Court in *State Street* and *Excel* correctly perceived that it is less helpful in resolving the hard cases of process claims at the cutting edge of technology. On the other hand, contrary to appellant's arguments, the fact that a focus on physical structure is often misplaced in today's world does not mean that *any* process that produces "a useful, concrete, and tangible result" should be patentable. Yahoo! submits that, properly understood, the cases of both this Court and the Supreme Court require more. Specifically, drawing the line between patentable and unpatentable subject matter requires not only analyzing the end result of a process, but also whether the application describes the process in a specific, step-by-step manner, which if followed would reliably produce the end result in a stable, predictable manner. For the reasons set forth below, a process sufficiently stable, predictable, and reproducible as to be essentially mechanical or

"machine-like" satisfies the patent eligibility requirements of Section 101 regardless of whether it is implemented by a particular apparatus.

As discussed *supra* at 5-7, Supreme Court precedent indicates that while patentable subject matter is very broad, it nonetheless has limits -- in particular, "laws of nature, natural phenomena, and abstract ideas" are outside the realm of patentability. *See, e.g.*, *Diehr*, 450 U.S. at 185. The present case does not involve the first two categories, but poses the question how to draw the line between "abstract ideas" and a "process" that may *incorporate* abstract ideas but nonetheless sets forth novel steps for achieving a practical result in sufficient detail so as to represent patentable "Progress of Science and the Useful Arts." U.S. Const. Art. 1, § 8.

When attempting to draw this line, the benefit of considering machine implementation or physical transformation is that these aspects of a process often supply the concreteness and specificity necessary to show that the claims are more than an abstract idea -- that they represent a scientific method for obtaining a practical result. There are, however, instances where claims referencing machine implementation or physical transformation in only a nominal or trivial manner remain abstract and unclear, with vaguely defined steps that would not necessarily lead to a reasonably stable, predictable, reproducible result. *See, e.g.*, *Flook*, 437 U.S. at 586. Distilled to their core, stability, predictability, and reproducibility are

the qualities of a patentable process; those qualities are usually present in cases of machine implementation because those characteristics are essentially mechanical ones. That fact, however, should not obscure the real point of the patent eligibility inquiry -- the point of the inquiry is not physicality for its own sake, but to distinguish abstract ideas from patentable inventions. An inquiry into the stability, reproducibility, and predictability of a sufficiently defined step-by-step process gets to the heart of the matter because those are characteristics of a machine-like or scientifically reproducible process. An inquiry into physicality is neither necessary nor sufficient.

The Supreme Court's cases recognize that the stability, predictability, and reproducibility of the process described by a patent application are central to evaluating whether that process represents only an abstract idea or rather a step-by-step method for obtaining a useful, tangible result. In *Flook*, for example, the Court found that claims including a mathematical formula for calculating an "alarm limit" to signal danger or inefficiency in a catalytic conversion process did not meet patentability requirements. The Court noted that it was clear the formula was intended for "computerized calculations." 437 U.S. at 586. But the Court found that the claims as a whole did not adequately disclose exactly *how* the calculated alarm limit would be applied to adjusting the catalytic conversion process:

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

Id. at 586; *see also Diehr*, 450 U.S. at 192 n.14 (emphasizing that these shortcomings had been critical to the decision in *Flook*). The Court thus demonstrated a concern with more than simply whether the process effected a physical transformation or whether the contemplated "computerized calculations" were to be implemented on a machine. Rather, the Court was interested in the steps of the process themselves. In short, the Supreme Court's analysis in *Flook* found the absence of stability, predictability, and reproducibility in the claimed process to be significant to the Section 101 analysis.

In contrast, the Court in *Diehr* found that the claims and application as a whole disclosed specific steps showing how an abstract mathematical formula would be applied in the claimed process to produce a practical, tangible result. The Court found that "respondents' claims describe in detail a step-by-step method for accomplishing [the curing of synthetic rubber] beginning with the loading of a mold with raw, uncured rubber and ending with the eventual opening of the press at the conclusion of the cure." 450 U.S. at 184. The Court explained that the "process admittedly employs a well-known mathematical equation, but

[respondents] 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 (emphasis added). Contrasting the case with *Benson* and *Flook*, the Court concluded that "respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process for curing synthetic rubber." 450 U.S. at 187. In the Court's view, then, the preciseness and completeness of the application's description of the process's steps -- the "detail" of the "step-by-step method" -- were critical to holding that the process as a whole was patent eligible. *Diehr* thus confirms that under Section 101 it is significant whether the claimed process is sufficiently stable, predictable, and reproducible, as well as whether there is a "useful, concrete, and tangible result."

Consistent with these Supreme Court precedents, this Court's cases have also addressed whether the steps set forth in process claims provide sufficient information about how any abstract concepts involved in the process would be specifically implemented to produce a "useful, concrete and tangible" result. In *Alappat*, for example, the Court wrote:

> Claim 15 as written is not "so abstract and sweeping" that it would "wholly pre-empt" the use of any apparatus employing the combination of mathematical calculations recited therein. *See Benson*, 409 U.S. at 68-72 (1972). Rather, claim 15 is limited to the use of a particularly claimed combination of elements performing the particularly claimed combination of calculations to transform, *i.e.*,

> rasterize, digitized waveforms (data) into anti-aliased, pixel illumination data to produce a smooth waveform."

Alappat, 33 F.3d at 1544. Similarly, in *State Street*, while this Court focused on that fact that the result of the claimed process was sufficiently "useful, concrete and tangible," that determination was supportable only because the claim at issue clearly indicated how the steps leading to the intended results were to be performed. 149 F.3d at 1373. The Court wrote that "claim 1, properly construed, claims a machine, namely, a data processing system for managing a financial services configuration of a portfolio established as a partnership, which machine is made up of, at the very least, *the specific structures disclosed in the written description*." *Id*. at 1372 (emphasis added).

Finally, in *AT&T v. Excel*, this Court also assessed whether the elements of the claims at issue were defined adequately to show how abstract concepts were transformed in a series of specific steps to yield a sufficiently practical result:

> It is clear from the written description of the '184 patent that AT&T is only claiming a process that uses the Boolean principle in order to determine the value of the PIC indicator. The PIC indicator represents information about the call recipient's PIC, a useful, non-abstract result that facilitates differential billing of long-distance calls made by an IXC's subscriber. 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 Section 101.

172 F.3d at 1358. The Court further observed that "our inquiry here focuses on whether the mathematical algorithm is applied *in a practical manner* to produce a useful result." *Id.* at 1360 (emphasis added). Accordingly, the *Excel* Court's analysis implicitly ties its results-focused test to analysis of how abstract concepts involved in the claimed process are applied to produce those results.

In sum, the precedents of both the Supreme Court and this Court indicate that any process involving abstract concepts should be deemed patent eligible only when (1) it produces a result that is "useful, concrete, and tangible" *and* (2) the claim sets forth clearly defined steps permitting that result to be reached in a way that is stable, predictable, and regularly reproducible. As further set forth directly below, this test will supply meaningful limits to Section 101.

II. THE STANDARD PROPOSED BY *AMICI* SUPPLIES REASONABLE AND WORKABLE BOUNDARIES FOR SECTION 101 BOTH IN THIS CASE AND IN THE RUN OF CASES.

A. Under the Standard Proposed Herein, Bilski's Claim, Though it Produces a Useful Result, is Insufficiently Defined to be Patent-Worthy.

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

Appellant argues that the claimed method "produces 'a useful, concrete, and tangible result'" because it enables commodities suppliers and consumers to lessen

their risk varying prices caused by fluctuations in the demand for the commodity. *See* App. Supp. Br. 3. But the implementing steps are so inadequately defined that they cannot be reliably followed to produce the result in a stable, predictable, or reproducible manner. For example, both the first and third limitations of the claim involve "initiating a series of transactions." There are, however, many ways to initiate a series of transactions, and the claim as a whole provides no constraint, structure, or definition to explain how these steps are to be performed. Nor does the appellant suggest how choosing any particular approach to performing each step might affect how the intended result is to be achieved. In short, these steps are so indefinite that they represent essentially no limitation at all. Accordingly, the claim as written is "so abstract and sweeping" that it would "wholly pre-empt" the use of any means to achieve the intended result. *See Benson*, 409 U.S. at 68-72. Bilski's process accordingly should not be held to state statutory subject matter.

B. The Test Proposed by *Amici* Provides Bounds to Section 101 that will not Unsettle the Precedents of this Court or the Supreme Court.

As set forth above, the test *amici* propose draws upon the cases of both this Court and the Supreme Court. Thus, adopting it will not unsettle the considered precedents of either court. Re-examining the key precedents through the lens of the proposed standard illustrates this point.

In *Benson*, the Supreme Court considered a patent application for a method of converting binary-coded decimal numerals into pure binary numbers, a process to be performed by a digital computer. 409 U.S. at 64. The patent application disclosed only a series of mathematical operations to be performed on any number entered as the input; the process would then provide a new number as output.

Under the proposed test, the invention in *Benson* would not be patentable because the result of the process was not sufficiently useful, concrete, and tangible. The defect is not simply that there was no transformation or reduction of an article to a different state or thing, *id*. at 70, but rather that the process did not purport to *do* anything concrete at all other than explain, through a series of steps, how to solve a mathematical problem that could be useful in many contexts. *See id*. at 68. It is well established that an equation is not patentable, though an application of an equation to a particular use can be. *See*, *e.g.*, *Diehr*, 450 U.S. at 187; *Flook*, 437 U.S. at 589. Because the invention claimed in *Benson was* the mathematical formula, the claim did not state statutory subject matter; the test proposed by *amici* thus focuses on the factors that were dispositive for the Court, without getting unnecessarily distracted by the fact that the patent application contemplated the use of a machine to perform the required calculations. *Cf. Diehr*, 450 U.S. at 185-86 (explaining that the invention claimed in *Benson* was a procedure for solving a

mathematical problem and that, as such, it was similar to a law of nature and not patentable).

Similarly, the patent application in *Flook* would not have been granted under the proposed test. In that case, the application described a process for calculating alarm limits for monitoring catalytic conversion processes. 437 U.S. at 585. As the Court explained in *Diehr*, "the Court [in *Flook*] concluded that the application sought to protect a formula for computing this number." *Diehr*, 450 U.S. at 186. While the applicant did not seek to wholly preempt the mathematical formula, as was the case in *Benson*, the essence of the patent application was that it disclosed a new mathematical algorithm. *See id.* at 192 n.14 (noting that aside from the mathematical formula there was "token postsolution activity" involved in *Flook*, which did not alter the fact that the formula itself was the invention).

While the result of the process in *Flook* -- setting new alarm limits -- is concrete, useful, and tangible, our proposed test reveals the failing in the patent application. The patent claims did not disclose a stable, predictable, and reproducible process by which the result could be obtained -- they did not, for example, explain how to select any of the various inputs to the formula. *See Diehr*, 450 U.S. at 186 n.10. By focusing on the steps as well as the result, it becomes clear that the claimed invention was simply the formula. The case, which at first appears distinguishable from *Benson* because it calculated new alarm limits

applicable to a process governing a physical transformation, becomes *Benson*'s twin. Moreover, the test proposed by *amici* focuses on the same inquiry that was actually determinative for the Court: because the patent application in *Flook* discloses nothing more than a new formula, and a formula is not the kind of useful, concrete, and tangible result of a process that is entitled to patent protection, the Court properly concluded that the patent did not claim statutory subject matter.

It bears emphasizing, however, that if the claims in *Flook* had described a stable, predictable, and reproducible process -- if, for example, the invention coupled a formula for calculating alarm values with techniques for incorporating real-world conditions as input variables -- the fact that the process employed a formula would not have precluded it from being statutory subject matter. *See Flook*, 437 U.S. at 586; *Diehr*, 450 U.S. at 192 n.14; *see also Alappat*, 33 F.3d at 1543 ("[B]ecause the dispositive inquiry is whether the claim as a whole is directed to statutory subject matter, it is irrelevant that a claim may contain, as a part of the whole, subject matter which would not be patentable by itself"). Under the test proposed by *amici*, there would be clearly defined steps to produce a stable, predictable, reproducible result, and the result would be useful, concrete, and tangible.

The patent in *Diehr*, in contrast, easily meets the requirements of the proposed test. Again, the process claimed there was a better way of curing rubber

resulting in significantly less "overcuring" and "undercuring." 450 U.S. at 187. Such a result is useful, concrete, and tangible. And there was no question that the steps were thoroughly described, such that they could be reliably followed in producing a stable, predictable, reproducible result. *See supra* at 14-15.

Applying the proposed test to this Court's cases also yields similar results. As to *State Street*, there is no question that (as this Court noted) a calculated share price that enables the pooling of mutual fund assets is a useful, concrete, and tangible result. Significantly, however, the patent application in *State Street*, unlike the application in *Flook*, specifies where the data comes from and how it is to be recorded. Thus, the steps are well defined and can be followed to produce a stable, predictable, reproducible result. While the patent in *State Street* could have ultimately proven invalid for other reasons, s*ee State Street*, 149 F.3d at 1372 & n.2, 1375, it nonetheless satisfies the requirements of the proposed test for determining statutory subject matter under Section 101.

The proposed test does not change the result in *Excel*, either, although it does refocus the analysis. That case involved a process for determining and then recording whether a long-distance call originated and terminated on the same network by means of a so-called "PIC" indicator, which would facilitate differential billing (that is, callers would pay less if they called people who used the same provider). *See* 172 F.3d at 1353, 1355. The Court determined that the

process claimed was directed at patentable subject matter because, while it involved a simple mathematical principle, the process as a whole provided a useful, non-abstract result that facilitated differential billing. *See id*. at 1358. The proposed test would consider the steps as well as the result, but would reach the same conclusion. Because the steps to determining and recording the PIC were well defined and could be followed scientifically to a useful, concrete, and tangible result, the claim should be understood to be drawn to statutory subject matter.

C. The Test Proposed by *Amici* Will Accommodate "New, Onrushing Technology."

A further virtue of the proposed test is that it sets limits around Section 101 patent eligibility in a manner suited to accommodating new technology.

Advances in software are at the center of the technological progress of the last few decades. Growth and innovation in the American economy are increasingly centered on software-driven and services-based industries. *See generally* SAP Br. An important measure of the adequacy of any test is how well it applies in that context. The proposed test will generally recognize software as patent eligible, provided that it is directed at a sufficiently practical use.[1] The

[1] Yahoo! agrees with Microsoft that even under a test focused on physicality, software is generally patent eligible subject matter. Software on a personal computer, or executing in a distributed computing environment, renders the system a physically different "machine" eligible for patent protection. *See* Microsoft Br. Part II.A; *see also* SAP Br. (noting that software claims tied to a computer are

operation of software, by its nature, entails a process of specifically implemented steps. Assuming all operating conditions and input variables are the same, a software program is typically expected to perform in the same manner and produce essentially the same results each time it is run. Thus, software designed to, for example, transmit funds from one bank account to another and generate appropriate tracking data would be patentable subject matter because the result would be useful, concrete, and tangible (although it might not be patentable for other reasons, such as a lack of novelty), even though the software would generate as a result only new figures for the two accounts that would then be recorded. That process would be patentable subject matter even if the software was indifferent to which recording mechanisms were used, or even which communications medium (the Internet or some unspecified private network) were used, although it required both to function. *See also* Regulatory DataCorp, Inc. Br. (describing patented software designed to identify suspicious banking transactions). On the other hand, a software program that simply calculates the value of pi to thousands of decimal places would not be patentable, because the result of the program would not satisfy the requirement that the result be "useful, concrete, and tangible."

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unlike the claims in the Bilski application and that software is by its nature not an abstract idea, but an implementation of an idea).

Under the proposed test, sufficiently stable, predictable, and reproducible processes could also be patentable even if they largely involve human activity and mental steps. For example, an application claiming an assembly-line process requiring a specific spacing of workers, a flow of work between assembly stations at a certain rate, a particular number of distinct assembly stations, and so on, *combined with a concrete result* in the form of specified cost savings or efficiencies should set forth patentable subject matter. Assuming the claims were drawn to show specifically how any variations in the process's manual steps or any independent judgment in its mental steps would be constrained, the invention should meet Section 101's requirements, although the invention might not satisfy the other requirements for patentability. In other words, so long as *both* the means of producing the result envisioned and the result itself were sufficiently stable, predictable, and reproducible, there is no reason for distinguishing human-implemented (but essentially "machine-like") processes from machine-implemented processes. A claim like this would satisfy our two-step test because the process is stable, predictable, and reproducible, and it also produces a useful, concrete, and tangible result.

The popular Nintendo Wii video game console helps to illustrate the sort of technologically innovative process that could be more appropriately analyzed under the proposed test. To play Wii video games, the player holds a Wii

controller and performs realistic real world movements (*e.g.*, to emulate swinging a baseball bat or sword) which are detected and produce corresponding movements within the game itself. As technology continues to advance, these types of human-implemented steps may well become common parts of industrial processes -- essentially a new type of interface with machines. Innovations in such processes that find new ways to harness manual or mental steps should not be excluded from patentability merely because they are performed by humans rather than by machines. *Amici* submit that an application for a patent including specific human-implemented steps as part of a stable, predictable, and reproducible process leading to a useful concrete and tangible result should state patentable subject matter. Such processes could be more coherently analyzed under the standard proposed by *amici* than by forcing new technologies into categories inherited from very different technological times.

III. ANSWERS TO QUESTIONS POSED BY THE COURT.

In light of the foregoing, Yahoo! offers the following answers to the questions posed by the Court.

1. Whether claim 1 of the 08/833,982 patent application claims patent-eligible subject matter under 35 U.S.C. § 101?

No. As discussed in Part II.A, while claim 1 produces a useful, concrete, tangible result, it does so by means of steps that are inadequately defined, and so

the result cannot be said to be stable, predictable, and reproducible under the test produced by *amici*. The application therefore does not claim patent-eligible subject matter.

2. What standard should govern in determining whether a process is patent-eligible subject matter under section 101?

As discussed in Part I, for a process involving abstract concepts to be directed at patent-eligible subject matter under section 101, the process must (i) produce a sufficiently practical result (that is, one that is useful, concrete, and tangible) and (ii) the claim, considered as a whole, must include clearly defined steps which implement the abstract concepts in a way that is reasonably stable, predictable, and reproducible.

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?

As discussed above in Part II.A, the claimed subject matter is not patent-eligible because the claim itself fails to set forth with sufficient clarity how the abstract ideas or mental processes involved in the claim are applied in a series of steps to produce a result that is stable, predictable, and reproducible. Consequently, the claim, when considered as a whole, is too abstract and sweeping, and does, in practical effect, claim the very idea of hedging.

As discussed in Part I, a claim that contains both mental and physical steps can create patent-eligible subject matter when a sufficiently practical application results from the implementation of the mental steps in a clearly defined structure or process, as determined from looking at the claim as a whole.

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?

No. As discussed in Part I above, this formulation is both over- and under-inclusive. While a process involving a physical transformation or the use of a machine may quite likely constitute patent-eligible subject matter, it is not necessarily so. A process that is tied only trivially to a machine should not be patent eligible under section 101, in accord with cases like *Benson*. At the same time, the Supreme Court has never held, and has expressly refrained from holding, that a process *must* either effect a physical transformation or be tied to a specific machine for it to be patent eligible. This Court should not close the door where the Supreme Court has left it open, especially given the unmistakable intent of Congress that the patent statute should be understood to have a broad sweep.

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?

No. Those cases both involved the combination of abstract processes with

machines to create new, useful results, properly constrained by well defined steps. While the Court in those cases did not emphasize that the steps to achieve the desired ends were clearly defined and capable of being followed to produce stable, predictable, and reproducible results, they were, as discussed in Part II.B above. The cases properly focused on the questions that were most pressing in each case, and there is no need to revisit those determinations. Instead, the Court should simply note that the cases did not purport to define exhaustively the requirements for a claimed process to be directed at statutory subject matter, and it should adopt the test proposed by *amici*.

CONCLUSION

The decision of the Board of Patent Appeals and Interferences should be affirmed.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on April 7, 2008, I caused two copies of the foregoing Brief of Amici Curiae Yahoo! Inc. and Professor Robert P. Merges to be served to the addressees below:

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