



# The "Machine-Or-Transformation Test" For Processes

- *IP Law360*, October 30, 2008

Author(s): Charles R. Macedo, David Boag

*Law360, New York (October 30, 2008)* — The U.S. Court of Appeals for the Federal Circuit today issued its much awaited decision in *In re Bilski*, No. 2007-1130 (Fed. Cir. Oct. 30, 2008) (en banc). The majority opinion, authored by Chief Judge Michel and joined in by eight of the judges on the Court, seeks to return patent-eligible subject matter jurisprudence to the fundamental principles enunciated by the Supreme Court in its prior decisions. The majority opinion relied upon the so-called "machine-or-transformation test" set forth by the Supreme Court in its *Benson*, *Flook* and *Diehr* decisions as the as the "governing" test in this area. Under the majority's test, a patent-eligible process must either be tied to a particular machine, or transform an article.

The majority rejected existing alternative tests as short cuts to a full analysis under the machine-or-transformation test, including the previously-rejected "Freeman-Walter-Abele" and "technological arts" tests, and the previously relied upon "useful, concrete and tangible results" test.

The majority took this opportunity to reformulate its prior jurisprudence in this subject area to bring it into what it viewed as conformity with its current reading of binding Supreme Court precedent.

This guest column provides an overview of the "machine-or-transformation test" as adopted by the majority opinion and a brief summary of the analyses presented in the dissenting and concurring opinions.

Part I sets forth the relevant statutory framework under which patent eligibility is determined, as discussed in the majority opinion.

Part II discusses the majority opinion authored by Judge Michel. Part III sets forth a brief summary of the dissenting and concurring opinions.

## Part I: The Relevant Statutory Framework

The scope of patent-eligible subject matter is defined in 35 U.S.C. § 101:

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."



Thus, there are four categories of patent-eligible subject matter defined by § 101: (1) processes; (2) machines; (3) manufactures; and (4) compositions of matter. At issue in the present dispute is what constitutes a patent-eligible “process.” (See Majority Op. at 5).

In this regard, the Patent Act 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). The majority found this definition unhelpful because it includes the term “process” in it. (Majority Op. at 6, n.3).

The ordinary meaning of “process” is well recognized to be broad. (See, e.g., Majority Op. at 6, quoting Webster’s New International Dictionary of the English Language 1972 (2d ed. 1952) (“process” means “[a] procedure... [a] series of actions, motions, or operations definitely conducting to an end, whether voluntary or involuntary.”)).

Courts have recognized that in addition to falling within at least one of the four statutory categories of patent-eligible subject matter, an invention must avoid the three judicially created exceptions: (1) laws of nature; (2) natural phenomena; and (3) abstract ideas. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (“Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas.”); *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (“This is not to suggest that § 101 has no limits or that it embraces every discovery. The laws of nature, physical phenomena, and abstract ideas have been held not patentable.”). The majority characterized these three exclusions as “fundamental principles.” “The true issue before us then is whether Applicants are seeking to claim a fundamental principles (such as an abstract idea) or a mental process.” (Majority Op. at 7).

The majority left unmentioned the fact that Congress, in adopting the Patent Law, and the Supreme Court and Federal Circuit in interpreting the Patent Law, recognize the broad breadth of patent-eligible subject matter. But cf. *Chakrabarty*, 447 U.S. at 308-09 (“Congress plainly contemplated that the patent laws would be given wide scope... The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to ‘include anything under the sun that is made by man.’ S. Rep. No. 1979, 82nd Cong., 2d Sess., 5 (1952); H. R. Rep. No. 1923, 82nd Cong., 2d Sess., 6 (1952).”); *Diehr*, 450 U.S. at 182; *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998); *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1355 (Fed. Cir. 1999); see also *J.E.M. AG Supply v. Pioneer Hi-Bred Int’l.*, 534 U.S. 124, 130 (2001) (“As this Court recognized over 20 years ago in *Chakrabarty*, the language of § 101 is extremely broad.”) (internal citation omitted).

## **Part II: The Majority Opinion By Judge Michel**

### ***A. The Machine-Or-Transformation Test Is The Governing Test***

In the majority opinion authored by Chief Judge Michel, and joined in by Circuit Judges Lourie, Schall, Bryson, Gajarsa, Linn, Dyk, Prost and Moore, the Court sought to bring its prior jurisprudence as to what constitutes a patent-eligible process under 35 U.S.C. § 101 in line



with binding Supreme Court precedent.

In particular, the majority opinion rejected all other formulations of what constitutes a patent-eligible “process” in favor of the Supreme Court’s “machine-or-transformation test.”

The majority described the machine-or-transformation test” as the “definitive test” in this area and defined it as follows:

“A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.”

(Majority Op. at 10).

The majority went on to explain how the machine-or-transformation test acts as a check on processes that would preempt “fundamental principles” if patented:

“A claimed process involving a fundamental principle that uses a particular machine or apparatus would not pre-empt uses of the principle that do not also use the specified machine or apparatus in the manner claimed.

“And a claimed process that transforms a particular article to a specified different state or thing by applying a fundamental principle would not pre-empt the use of the principle to transform any other article, to transform the same article but in a manner not covered by the claim, or to do anything other than transform the specified article.”

(Majority Op. at 10).

The majority opinion also rejected arguments that the machine-or-transformation test should not be adopted as the sole test governing § 101 analyses. (Majority Op. at 13).

In doing so, it relied upon the failure of the Supreme Court in *Diehr* to repeat its prior caveats against foreclosing inventions that fall outside the machine-or-transformation test as evidence that no such caveat remained. (See Majority Op. at 14). However, one could contend that there was no such failure in *Diehr*, as evidenced by the use of the “e.g.” modifier in *Diehr*:

“On the other hand, 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.”

*Diehr*, 450 U.S. at 192 (quoted in Majority Op. at 15, n.12). Cf. *AT&T*, 172 F.3d at 1358-59 (“The ‘e.g.’ signal denotes an example, not an exclusive requirement.”).

Curiously, despite its conclusion that the machine-or-transformation test is the governing test today, the majority nevertheless left the door a little open to whether an invention that falls



outside such a test may nonetheless someday be found to be a patent-eligible process:

“Nevertheless, we agree that future developments in technology and the sciences may present difficult challenges to the machine-or-transformation test, just as the widespread use of computers and the advent of the Internet has begun to challenge it in the past decade. Thus, we recognize that the Supreme Court may ultimately decide to alter or perhaps even set aside this test to accommodate emerging technologies.

“And we certainly do not rule out the possibility that this court may in the future refine or augment the test or how it is applied. At present, however, and certainly for the present case, we see no need for such a departure and reaffirm that the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under § 101.”

(Majority Op. at 14-15).

#### *B. Caveats On The Machine-Or-Transformation Test*

The majority set forth two caveats on the machine-or-transformation test:

First, “mere field-of-use limitations are generally insufficient to render an otherwise ineligible process claim patenteligible.” (Majority Op. at 15). The majority warned that “preemption is merely an indication that a claim seeks to cover a fundamental principle itself rather than only a specific application of that principle.” (Majority Op. at 15-16).

Thus, the majority further explained that “a claim that is tied to a particular machine or brings about a particular transformation of a particular article does not pre-empt all uses of a fundamental principle in any field but rather is limited to a particular use, a specific application. Therefore, it is not drawn to the principle in the abstract.” (Majority Op. at 15).

Second, the majority recognized that “insignificant postsolution activity will not transform an unpatentable principle into a patentable process.” (Majority Op. at 16). Thus, “even if a claim recites a specific machine or a particular transformation of a specific article, the recited machine or transformation must not constitute mere ‘insignificant postsolution activity.’” (Majority Op. at 16-17). The majority further expanded this caveat to encompass “insignificant extra-solution activity regardless of where and when it appears in the claimed process.” (Majority Op. at 17, n.14).

On the other hand, the majority also set forth some guiding principles on what the machine-or-transformation test does not mean.

“First, the Court has held that whether a claimed process is novel or non-obvious is irrelevant to the § 101 analysis.” (Majority Op. at 17). Thus, the majority recognized that the analyses under §§ 102, 103, 112, etc., should not be commingled as part of the § 101 analyses. Of course, issues regarding utility do remain under Section 101. (Majority Op. at 17, n.15).



“Second, the Court has made clear that it is inappropriate to determine the patent-eligibility of a claim as a whole based on whether selected limitations constitute patent-eligible subject matter... After all, even though a fundamental principle itself is not patent-eligible, processes incorporating a fundamental principle may be patent-eligible. Thus, it is irrelevant that any individual step or limitation of such processes by itself would be unpatentable under § 101.” (Majority Op. at 17-18).

### *C. All Other Tests Are Rejected*

The majority rejected all other tests under § 101 in favor of the governing machine-or-transformation test. In this regard, the majority opinion rejected efforts to create a “short-cut” substitute, as it properly should.

The majority rejected the so-called Freeman-Walter-Abele test as “inadequate.” That test, according to the majority, required two steps: “(1) determining whether the claim recites an ‘algorithm’ within the meaning of Benson, then (2) determining whether the algorithm is ‘applied in any manner to physical elements or process steps.’” (Majority Op. at 19).

“In light of the present opinion, we conclude that the Freeman-Walter-Abele test is inadequate. Indeed, we have already recognized that a claim failing that test may nonetheless be patent-eligible. See *In re Grams*, 888 F.2d 835, 838-39 (Fed. Cir. 1989). Rather, the machine-or-transformation test is the applicable test for patent-eligible subject matter.” (Majority Op. at 19).

The majority also revisited the “useful, concrete and tangible result” language associated with *State Street* and first set forth in *Alappat*. (Majority Op. at 19). Here again, it rejected this language as a substitute for the machine-or-transformation test: “But while looking for ‘a useful, concrete and tangible result’ may in many instances provide useful indications of whether a claim is drawn to a fundamental principle or a practical application of such a principle, that inquiry is insufficient to determine whether a claim is patent-eligible under § 101.

“And it was certainly never intended to supplant the Supreme Court’s test. Therefore, we also conclude that the ‘useful, concrete and tangible result’ inquiry is inadequate and reaffirm that the machine-or-transformation test outlined by the Supreme Court is the proper test to apply.” (Majority Op. at 20).

The majority also unequivocally rejected the so-called “technological arts test” that some amici urged be adopted. In this regard, the majority opinion rightfully found that, “the contours of such a test... would be unclear because the meanings of the terms “technological arts” and “technology” are both ambiguous and ever-changing.

“And no such test has ever been explicitly adopted by the Supreme Court, this court, or our predecessor court, as the Board correctly observed here. Therefore, we decline to do so and continue to rely on the machine-or-transformation test as articulated by the Supreme Court.” (Majority Op. at 21 (footnote omitted)).





Significantly, the majority “further reject[ed] calls for categorical exclusions beyond those for fundamental principles already identified by the Supreme Court.” (Majority Op. at 21). This is a position our submission took very firmly. In doing so, the majority confirmed that prior efforts to curtail so-called business methods were improper:

“We rejected just such an exclusion in *State Street*, noting that the so-called ‘business method exception’ was unlawful and that business method claims (and indeed all process claims) are ‘subject to the same legal requirements for patentability as applied to any other process or method.’ We reaffirm this conclusion.” (Id.) (internal citation omitted).

Likewise, buried deep in footnote 23, the majority opinion confirmed that it would not adopt a broad exclusion of “software or any other such category” from being patent-eligible subject matter under binding Supreme Court precedent.

The majority also attempted to clarify some “misunderstanding” of the prior panel decision in *Comiskey*. It expressly rejected the interpretation of *Comiskey* as applying “a new § 101 test that bars any claim reciting a mental process that lacks significant ‘physical steps.’”:

“We did not so hold, nor did we announce any new test at all in *Comiskey*. Rather, we simply recognized that the Supreme Court has held that mental processes, like fundamental principles, are excluded by § 101.” (Majority Op. at 22).

The majority further explained that a “physical test” has been expressly rejected by the Federal Circuit in *AT&T*, and continued to reject such a test. The majority explained its rationale as follows: “Thus, the proper inquiry under § 101 is not whether the process claim recites sufficient ‘physical steps,’ but rather whether the claim meets the machine-or-transformation test.

“As a result, even a claim that recites ‘physical steps’ but neither recites a particular machine or apparatus, nor transforms any article into a different state or thing, is not drawn to patent-eligible subject matter.

“Conversely, a claim that purportedly lacks any ‘physical steps’ but is still tied to a machine or achieves an eligible transformation passes muster under § 101.” (Majority op. at 23).

#### *D. The Biliski Claim Was Found Not To Be Patent-Eligible Subject Matter*

The specific representative claim in *Biliski* read as follows:

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

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



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

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

In analyzing this claim, the majority cast the machine-or-transformation test as a two-part inquiry. “[A]n applicant may show that a process claim satisfies § 101” by either (1) “showing that his claim is tied to a particular machine” or (2) “showing that his claim transforms an article.”

The majority further explained that under either branch, the analysis should consider that: (1) the use of specific machine or transformation of an article must impose meaningful limits on the claims scope to impart patent-eligibility; and (2) the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity. (Majority Op. at 24).

The majority concluded that the Biliski claim failed both parts of the test.

With respect to the “machine implementation” branch of the inquiry, the Applicant admitted the claim was not so limited, so the majority left to future cases, “the elaboration of the precise contours of machine implementation, as well as the answers to particular questions, such as whether or when recitation of a computer suffices to tie a process claim to a particular machine.” (Majority Op. at 24).

With respect to the “transformation” branch of the inquiry, the majority provided more analysis, stating that “[a] claimed process is patent-eligible if it transforms an article into a different state or thing. This transformation must be central to the purpose of the claimed process.” (Majority Op. at 24-25).

It was considered “self evident” that such a transformation would include, for example, “a process for a chemical or physical transformation of physical object or substances”. (Majority Op. at 25). The majority opinion noted that today’s “raw materials” are “electronic signals” and “electronically-manipulated data.”

The majority further found more difficult the question of whether “abstract concepts such as legal obligations, organizational relationship and business risks” should also fall within this exception. (Id.).

On the more difficult question of the “abstract concepts” at least, the majority opinion held that “case law has taken a measured approach to this question, and we see no reason to expand the boundaries of what constitutes patent-eligible transformations of articles.” (Majority Op. at 25).



With respect to the “transformation” branch, the majority held “that the Applicants’ process as claimed does not transform any article to a different state or thing. Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances. Applicants’ process at most incorporates only such ineligible transformations.” (Majority Op. at 27).

The majority’s analysis was based on the reasoning that “Applicants here seek to claim a non-transformative process that encompasses a purely mental process of performing requisite mathematical calculations without the aid of a computer or any other device, mentally identifying those transactions that the calculations have revealed would hedge each other’s risks, and performing the post-solution step of consummating those transactions.

“Therefore, claim 1 would effectively preempt any application of the fundamental concept of hedging and mathematical calculations inherent in hedging (not even limited to any particular mathematical formula).

“And while Applicants argue that the scope of this preemption is limited to hedging as applied in the area of consumable commodities, the Supreme Court’s reasoning has made clear that effective pre-emption of all applications of hedging even just within the area of consumable commodities is impermissible...

“Moreover, while the claimed process contains physical steps (initiating, identifying), it does not involve transforming an article into a different state or thing. Therefore, Applicants’ claim is not drawn to patent-eligible subject matter under § 101.” (Majority op. at 31-32).

### **Part III: The Other Opinions**

#### *A. Judge Newman’s Dissent*

Judge Newman, in her dissenting opinion, offered a highly critical analysis of the majority’s opinion. She argued that the majority redefined the word “process” in the patent statute and usurped the role of Congress. Judge Newman contended that the definition of “process” adopted by the majority was previously rejected by the Supreme Court and that per se exclusions of subject matter from § 101 are impermissible.

The limitations on § 101 imposed by the majority are similarly not found in English common or statutory law or Federal Circuit precedent or its predecessor court’s precedent and do not properly reflect the evolution of process patents in the U.S.: “Its impact on the future, as well as on the thousands of patents already granted, is unknown.” (Newman at 1).

Judge Newman would first look to whether Bilski’s invention meets the requirements of novelty, nonobviousness, enablement, description, etc. (Newman at 36).





### *B. Judge Rader's Dissent*

Judge Rader, in his dissent, found that the majority's analysis is inapplicable in a "time of subatomic particles and terabytes." (Rader at 1). Judge Rader accused the majority of relying on "dicta taken out of context from numerous Supreme Court opinions dealing with the technology of the past." (Id.).

He properly noted that the focus should be on the fundamental rule that natural laws, natural phenomena and abstract ideas are excluded from patent protection. The various tests considered and rejected by the majority (as well as the machine-or-transformation test adopted by the court) simply restate the abstractness rule, which should stand on its own. (Rader at 4-5).

Judge Rader also offered an alternate better framework for judging these types of claims: anticipation, obviousness and other conditions for patentability. "These statutory conditions and requirements better serve the function of screening out unpatentable inventions than some vague 'transformation' or 'proper machine link' test." (Rader at 9).

### *C. Judge Mayer's Dissent*

Judge Mayer, in his dissent, stated that he would find the Bilski application to be unpatentable for the sole reason that it is directed to a method of conducting business. "Affording patent protection to business methods lacks constitutional and statutory support, serves to hinder rather than promote innovation and usurps that which rightfully belongs in the public domain." (Mayer at 1).

Business method patents, according to Judge Mayer, are inconsistent with the constitutional mandate because they are not directed to any technological or scientific innovation. (Mayer at 9).

Judge Mayer also looked at the practical implications of allowing business method patents on the workload of the USPTO and notes the frequent "poor quality" of these patents. (Mayer at 12-14). Judge Mayer stood alone in his analysis.

### *D. The Concurring Opinion Of Judges Dyk And Linn*

Judges Dyk and Linn filed a concurring opinion to respond to claims in the dissents of Judges Newman and Rader that the majority has usurped the legislative role with its decision and ventured away from the statute. (Dyk at 1).

Judge Dyk examined § 101 in detail in light of the Patent Act of 1793 and its origins in English patent practice at the time, specifically the Statue of Monopolies. The concurrence found no suggestion that "processes for organizing human activity were or ever had been patentable. Rather, the uniform assumption was that the only processes that were patentable were processes for using or creating manufactures, machines, and compositions of matter." Neither



the 1793 Act or courts applying the Act allowed patents of the type sought by Bilski, and nothing in the legislative history of the 1952 Act evidences an intent to expand the scope of patentable subject matter. (Dyk at 16-18).

“Our decision does not reflect ‘legislative’ work, but rather careful and respectful adherence to the Congressional purpose.” (Dyk at 20).

## **Conclusion**

In July 1998, the Federal Circuit issued its decision in *State Street* that put to rest the ill-conceived notion of a business method exception to patent-eligible subject matter.

In the decade since, our new information and electronic age economy has fostered a wide variety of innovations that have come before the U.S. Patent and Trademark Office. At times some have argued the patent-eligibility hurdle became too easy to cross, although other hurdles like novelty, obviousness, and definiteness lay in the way of undeserving inventions and patent protection.

Today’s majority opinion has raised the patent-eligibility hurdle under the guise of following binding Supreme Court precedent. For now, at least the safe harbors of patent eligibility of the machine-or-transformation test remain protected. Time will tell whether reliance on the 19th century notions of patent eligibility are appropriate in the new economic order the U.S. and the world face today in the 21st Century.

We look forward to future installments on the Federal Circuit (and perhaps others) on how the present analysis may be refined or augmented. (See Maj. Op. at 15).

---

**By [Charles R. Macedo](#) and David Boag**  
Amster, Rothstein & Ebenstein LLP

[Charles R. Macedo](#) is a partner and David Boag was an associate at Amster, Rothstein & Ebenstein LLP. The firm’s practice focuses exclusively on all facets of intellectual property law. Charles can be contacted at [cmacedo@arelaw.com](mailto:cmacedo@arelaw.com). The views expressed in this article are not necessarily the views of the firm or its clients.