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THE CONFLUENCE OF EUROPEAN ACTIVISM AND AMERICAN MINIMALISM: "PATENTABLE SUBJECT MATTER" AFTER BILSKI

Patrick E. King, Ryan M. Roberts, and Andrew V. Moshirnia†

Abstract

American courts and European jurists continue to struggle to define the scope of patentability in the recent era of rapid technological innovation. Though the European and American systems rely on opposing judicial philosophies and methods of statutory interpretation, both arrive at the same two-step analytical framework for determining patentability. This article compares the explicit European judicial reshaping of a flexible patentability standard to the Supreme Court's implicit tailoring in its recent decision Bilski v. Kappos. The comparison clarifies an otherwise challenging body of precedent and presents a blueprint for future analysis.

INTRODUCTION

For decades, courts and administrative bodies around the globe have been vexed by the complex challenge of assessing the patentability of Information Age technologies that rest on the fringes of the conventional categories of "patentable subject matter" codified in national patent statutes. Recently, both the European Patent Office ("EPO") and the Supreme Court of the United States issued important opinions responding to cries for guidance from practitioners on both

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sides of the Atlantic who have struggled to apply antiquated statutory frameworks to modern innovations in software coding, business methods, and other emerging technologies. In Europe, the EPO Enlarged Board of Appeal ("EBoA") took an activist approach in deciding Referral G03-08, recasting and rebalancing the patentability inquiry in service of these new technologies. In the United States, the Supreme Court took a conservative, minimalist approach in deciding *Bilski v. Kappos*, and wrapped this judgment tightly in the strict language of the Patent Act and in century-old precedent. Remarkably, the EPO and the Supreme Court, traveling on doctrinally antithetical paths, issued opinions that arrived at the same destination. Both bodies generously interpret the scope of potentially "patentable subject matter," and then scrutinize whether an invention is useful, novel, nonobvious, and clearly delineated in its written description to determine if a claimed invention is patent-worthy. A comparative analysis of the remarkably similar approaches birthed from vastly different textual context and jurisprudence adds clarity to an otherwise challenging body of United States precedent. As inventions become more difficult to define in physical terms, courts may place heightened importance on a novelty analysis, even going so far as to allow novelty to inform the patentability analysis.

Part I of the Article describes the structure of the European patent system and summarizes how activist judicial influences in Europe are transforming the system's historically narrow, exclusionary view into a more expansive understanding of patentability. This new conception of "inventiveness" led the EBoA, in Referral G03-08, to endorse a two-step analytical approach that focuses on an assessment of the novelty and "inventiveness" of a claimed invention.

Part II begins with a description of the background of the American patent system and examines the judicial influences that shaped and reshaped the standard for patentability in American courts over the last few decades. This part concludes with a detailed analysis of the most recent Supreme Court decision analyzing "patentable subject matter," *Bilski v. Kappos*. In *Bilski*, the Court adopted a strict reading of the language of the Patent Act and looked both at the

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novelty and the scope of the claimed invention, finding that the Bilski patent claimed an unpatentable "abstract idea." ³

In Part III, we argue that the strikingly dissimilar analytical paths taken in Europe and in the United States converge on a similar result. Each system uses a common analytical structure that broadly recognizes "patentable subject matter," then rigorously applies the traditional benchmarks for determining patent-eligibility: utility, novelty, usefulness, and the sufficiency of the written description. Applying this two-step standard to Supreme Court precedent, we find surprising consistency and clarity in an otherwise confusing jurisprudence. This convergence suggests that jurists in both Europe and America are seeking to accommodate the remarkable pace of innovation in emerging fields by weakening categorical filters to patentability.

I. JUDICIAL ACTIVISM: THE ASCENDANCY OF A PERMISSIVE TEST FOR PATENTABILITY IN EUROPE

European courts and administrative bodies confronted the difficulty of applying an inflexible statutory exclusion to ever-changing technologies by adopting an unabashedly activist role and reinterpretting the statute. These legal actors essentially read away the European Patent Convention's ("EPC") literal bar on software patents. Beginning with a statute that included an explicit exclusion of all computer programs from patent protection, the EPO and courts on the continent began whittling away at the rigid rule to the point where it is now a mere formality. ⁴ According to the latest pronouncement of the EBoA, the mere recitation of "technicality" surmounts the exclusionary phase of the patentability inquiry. ⁵ Only the second step in the analysis, the "inventiveness" component, does any work. ⁶ By reducing the exclusionary test to a hurdle easily cleared with a simple turn of phrase, Europe has adopted a flexible patentability analysis in which all computer programs are patentable, provided they meet the

³. See infra Part II.
⁴. Compare Convention on the Grant of European Patents, art. 52(2), Oct. 5, 1973, 1065 U.N.T.S. 199 [hereinafter EPC], with Referral G03/08, supra note 1. The EPC statute also explicitly excludes "methods for... doing business." EPC, art. 52(2). As discussed in Part III-C, infra, this exclusion may one day face the same fate as the software exclusion in Europe.
⁵. See Referral G03/08, supra note 1, at 32-33 (citing to Hitachi T 258/03 which "came to the conclusion that any claim involving technical means was not excluded from patentability by Article 52(2) EPC").
⁶. See id. at 31-33.
European equivalents of novelty and obviousness.\(^7\)

The European patent system is a complex network of judicial and administrative bodies, operating at local, regional, and international levels, all of which vie for influence in a vast and disparate landscape of national patent protections. International treaties such as the Patent Cooperation Treaty ("PCT") and the Agreement on Trade-Related Aspects of Intellectual Property ("TRIPS Agreement") have had only a slight impact on bringing uniformity to the patent laws in Europe.\(^8\) Recent legislative efforts to unify the national statutes, specifically the provisions relating to what is patentable, have failed spectacularly.\(^9\) But momentum continues to build to implement uniform standards to govern the patentability of useful inventions in the continent.

The most significant force in the development of a uniform standard for patentability over the last decade has been the European Patent Office. The fractured European patent landscape, a hybrid system of national and supranational authority, has begun to coalesce around guidance from the EPO.\(^10\) Increasingly, the EPO is moving from a traditional, narrow, exclusionary view of patentability towards an expansive, highly adaptive notion of patentability expressly designed to capture abstract, non-physical forms of innovation.

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7. See id.
8. See John Gladstone Mills III, *A Transnational Patent Convention For the Acquisition and Enforcement of Internal Patent Rights*, 88 J. PAT. & TRADEMARK OFF. SOC'Y 958, 962 (2006) (concluding that such international conventions have "not resulted in large scale-compliance in the development of uniform patent laws") ("Although international treaties such as the Paris Convention, the PCT treaty, and the TRIPS Agreement set international standards for patent protection, these treaties impose minimum standards, not uniform law, and do not prevent conflicting outcomes in patent cases. None of these instruments requires member states to provide a method for consolidating claims arising out of similar instances of alleged infringement. No state is under an obligation to enforce judgments of other members.").
10. See *Filing an Application*, EUROPEAN PATENT OFFICE, http://www.epo.org/patents/Grant-procedure/Filing-an-application.html (last visited Aug. 10, 2010) (One seeking patent protection in Europe may choose to file either individual national applications, or a single region-wide application); Vicenzo Di Cataldo, *From the European Patent to a Community Patent*, 8 COLUM. J. EUR. L. 19, 21 (2002) ("Each national system tends to harmonize its interpretation of the [European Patent Convention] in accordance with its own national body of law. Each State uses its own mechanisms to unify the legal interpretations of the EPC, namely through the power vested in its own unique court of last instance. But . . . there is no mechanism to coordinate the different national interpretations of the EPC on a supranational level.").
A. The Structure of Patent Protections in Europe

In 1973, the EPC created the pan-European patent system administered by the EPO in an effort to introduce a common European patent grant procedure. The EPC was amended in 2000, but the amendments left substantive patent law largely unchanged, including those provisions relating to "patentable subject matter." Although both the European Union ("EU") and the EPO are regional European bodies, their membership is not coextensive. The EPC-signatory countries comprise a broad swath of the European continent, not all of which are members of the EU.

Under the Convention, the EPO not only has the power to issue "European patents," but also the power to hear appeals of these applications in its quasi-judicial Boards of Appeal. Among these Boards of Appeal are twenty-six Technical Boards of Appeal and a Legal Board of Appeal, all of which hear appeals from the administrative and examining divisions of the Office. In addition to


15. See EPC, supra note 4, art. 21.

16. Boards of Appeal, EUROPEAN PATENT OFFICE, http://www.epo.org/about-us/boards-of-appeal.html (last visited Aug. 10, 2010); EPC, supra note 4, at art. 21. These divisions include the Receiving Section and Examining, Legal, and Opposition Divisions. Id. The
these appellate bodies, the EPO has an Enlarged Board of Appeal that does not serve as an additional level of jurisdiction, but instead is tasked with maintaining uniform applicability of the law.\textsuperscript{17} The EBoA may opine on inconsistencies in the law or otherwise important questions of law if requested by a Board of Appeal or by the President of the EPO.\textsuperscript{18} Specifically, a Board of Appeal may refer any question to the EBoA to ensure uniform applicability of the law or when a point of law of fundamental importance arises.\textsuperscript{19} The President of the EPO may also refer a point of law to the EBoA "where two Boards of Appeal have given different decisions on that question."\textsuperscript{20} As discussed in more detail below, the exact contours of these grounds for referral were of great consequence to the latest referral by the EPO President in that they directly confronted the European approach to software patentability.

\textbf{B. The EPO Currently Operates in a Legislative Vacuum}

While the EPO has continued to tackle issues of patentability within its Boards of Appeal, proposals such as the Commission Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-Implemented Inventions ("CII") have sought to impose uniformity across the continent through legislative action.\textsuperscript{21} In 2002, the European Commission acted to harmonize patent laws for software, largely by adopting the EPO approach.\textsuperscript{22} The initial incarnation of the proposed CII Directive

\footnotesize{Receiving Section is responsible for the examination of formal requirements of a "European patent" application up to the time when the Examining Division becomes responsible for substantive examination. \textit{id.} at art. 16. The Legal Division is responsible for maintaining the Register of European Patents which covers matters from registration of inventors to authorization of attorney representation. \textit{See id.} at art. 20. The Opposition Division is responsible for the examination of oppositions against any European Patent, a procedure that does not have an analogue in the U.S. \textit{See id.} at art. 19.

\textsuperscript{17} \textit{See Boards of Appeal, EUROPEAN PATENT OFFICE,} \texttt{http://www.epo.org/about-us/boards-of-appeal.html} (last visited Aug. 10, 2010).


\textsuperscript{19} \textit{Id.} at art. 112 (as amended Nov. 29, 2000), \textit{available at http://www.epo.org/patents/law/legal-texts/html/eepc/2000/e/arl112.html.}

\textsuperscript{20} \textit{Id.}


\textsuperscript{22} \textit{See Bray, supra note 9, at 3, 5; see also Robert E. Thomas & Larry A. DiMatteo, Harmonizing the International Law of Business Method and Software Patents: Following Europe's Lead, 16 TEX. INTELL. PROP. L.J. 1, 23-28 (2007).}
simply attempted to codify existing EPO precedent (and eliminate business method patents), but the ensuing negotiations generated significant controversy. In 2003, the European Parliament passed a heavily amended version of the Directive that placed many more limits on the scope of patentable inventions. Although different bureaucratic bodies objected to the bill’s form, and the Legal Affairs committee voted to abandon the entire process and begin anew, procedural quirks allowed the bill to reach a final vote. In its amended form, which severely restricted the scope of software patents, the bill pleased neither the proponents nor opponents of software patents. While software patent supporters felt that the proposed Directive contained too many ambiguities to serve the original purpose of harmonization, the detractors disliked that the Directive acknowledged the patentability of software at all. The fact that the respective memberships of the EU and the EPC do not completely overlap also added an extra political dimension to the conflict. In the final vote, the proposed Directive was roundly defeated, 14–648. Perhaps patent reform is too complex an undertaking, or simply too politically charged. Regardless, it will prove a vexing challenge for European legislatures to resolve complex patentability issues raised by evolving technologies.

C. Listening for a Melody Amidst the Jurisprudential Cacophony

Although the EPC aimed to harmonize the European patent system, obvious barriers stand in the way of regional uniformity. For example, the EPC includes a uniform patent examination and grant

23. See Bray, supra note 9, at ¶ 16 (“The Commission’s proposal was not that radical. However, it certainly raised considerable fears amongst small and medium-sized software developers that their livelihoods and the free software and open source models, sometimes referred to as ‘copyleft,’ could be threatened by patents taken out by large industry or purchased by speculators.”).
24. Id. at ¶ 20; see also Thomas & DiMatteo, supra note 22.
25. See Bray, supra note 9, at ¶ 27; Thomas & DiMatteo, supra note 22, at 28.
28. See Andreas Grosche, Software Patents – Boon or Bane for Europe?, 14 INT’L J.L. & INFO. TECH. 257, 262 (2006) (The EU’s efforts in pushing the Directive ‘raised concerns whether the proposed Directive is a Community hidden attempt to circumvent or amend the relevant restrictive provisions of the EPC.’
procedure, but the efforts to create a proper European Community patent have failed. The result is that a regional EPO application yields a “European patent” that does not entitle the applicant to exclusive rights over the entire EPC-signatory area. Instead, the “European patent” must be validated by each member state in which it is to be enforced, yielding a plurality of national level patents but no single transnational patent.

Perhaps an even greater barrier to uniformity is the lack of a supranational patent court of last instance that could enforce a single interpretation of the EPC provisions. The consequence of this fragmentation is parallel systems that interpret the same EPC provisions and often reach different results. Moreover, national courts typically are bound only by their own decisions and not those of the EPO. Still, EPO decisions provide a form of persuasive authority that national courts tend to follow, or at least seek to reconcile with existing national norms.

Not only has this tangled system created inconsistency between and among EPO jurisprudence and that of various national systems, the situation is further complicated because EPO jurisprudence is not binding on subsequent EPO tribunals in the sense typically seen in common-law systems.

30. Grosche, supra note 28, at 262 (noting that “[p]olitical attempts to create a European Community patent have stalled for decades”).
31. See EPC, supra note 4, art. 2(2).
35. See Referral G03/08, supra note 1, at 13 (citing EPC, supra note 4, at art. 23(3)).
the common-law tradition has added to volatility in this area of law, but the EPO Board has taken advantage of this flexibility. EPO judges are starting to move from a restrictive scope of patentability for software programs to a more expansive approach.\textsuperscript{36}

\textit{D. The EPC's Codification and the EPO's Interpretation of Statutory Patentability Requirements}

The EPC provides protection for "European patents" to the extent examination shows they fulfill certain conditions, including novelty, an "inventive step," and an industrial application.\textsuperscript{37} These EPC provisions are analogous to the American concepts of novelty, nonobviousness, and utility, respectively.\textsuperscript{38} Inventions must also avoid exclusion under the EPC's governing provisions on "patentable subject matter," Articles 52(2) and 52(3). Somewhat deceptively, Article 52, paragraph 2 of the EPC, excludes from patentability "schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers."\textsuperscript{39} Article 52, paragraph 3, goes on to state that "[t]he provisions of paragraph 2 shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such."\textsuperscript{40}

Although the plain language of Article 52(2) of the EPC seems to prohibit the patenting of computer programs, the words "as such" have provided courts and administrative agencies with leeway sufficient to distinguish between software in its pure form and otherwise patentable computer programs.\textsuperscript{41} Over the last twenty years, the EPO has effectively read the restriction against "programs for computers" out of Article 52(2) in its struggle to find a test that affords the appropriate protection to inventions in the computer age.\textsuperscript{42}

\textsuperscript{36} See generally Referral G03/08, supra note 1, at 33 ("T 424/03, Microsoft, finally extended the reasoning applied in T 258/03 to come to the conclusion that a claim to a program ("computer executable instructions" in the claim in question) on a computer-readable medium also necessarily avoids exclusion from patentability under Article 52(2) EPC. . . . This statement is quite unequivocal and stands alone as a reason for the claim not to be excluded under Article 52(2) EPC.").
\textsuperscript{37} EPC, supra note 4, at art. 52(1).
\textsuperscript{38} See Grosche, supra note 28, at 261 n.31-32.
\textsuperscript{39} EPC, supra note 4, at art. 52(2).
\textsuperscript{40} Id. at art. 52(3).
\textsuperscript{42} See, e.g., Case T-1173/97, Computer Program Product I/ IBM, 1999 O.J. EPO 609,
The doctrine has evolved from a restrictive, narrow test, which focused on the "technical contribution" of a claimed invention, to an expansive inquiry that largely reads any "technical" requirement out of the statute and focuses instead on the novelty and usefulness of a claimed invention.\(^4\)

The key steps in this evolution are described in a discussion of the landmark cases below. The EPO's first test, the "contribution approach" described in \textit{Vicom}, conflated the separate elements of "technicality" and "inventiveness."\(^4\) The EPO's analysis evolved into a "technical character" test, as seen in \textit{Microsoft}. This approach enforces a crisp separation of the "technicality" analysis from the "inventiveness" analysis and squarely places the focus of the patentability inquiry on a patent's "inventiveness" by reducing the "technicality" hurdle to a claim drafting exercise.\(^5\) During this evolution, the EPO, in \textit{BBC}, also addressed the related issue of whether a physical effect on a real world object is required to achieve a "technical effect" rendering the invention patentable.\(^6\) Finally, in Referral G 03/08, the EBoA formally adopted a methodology where the "technicality" step does essentially no work and the "inventiveness" step stands as the bulwark against meritless claims.\(^7\)

1. \textit{Vicom}: The "Contribution Approach"

The EPO's first attempt at tackling the issue of software inventions produced a test now known as the "contribution approach." In \textit{Vicom}, the Board formulated this approach in its consideration of a claimed software patent on an apparatus and methods for digitally processing images by a software program run on computer hardware.\(^8\) To qualify as patentable, the Board required that an invention make a "technical contribution" to an existing field that was

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\(^{43}\) Referral G 03/08, \textit{supra} note 1, at 32-33.


\(^{47}\) See Referral G 03/08, \textit{supra} note 1.

not excluded from patentability. Notably, for the purpose of determining “inventiveness,” this test ignored that portion of the inventor’s “technical contribution” that fell within the statutory excluded area of software. The test also imported considerations of novelty and “inventiveness” into the “technical” portion of the patentability analysis by looking to an invention’s “technical contribution” to the prior art. This interpretation relaxed the Article 52 software prohibition and provides one of the earliest examples of how European jurists confuse the “patentable subject matter” analysis with an analysis of the remaining hurdles to patent protection, such as novelty and “inventiveness.”

2. Microsoft: The “Technical Character” Test

As the EPO continued to struggle with the treatment of software programs under its patent system, the Board again liberalized its analysis and moved to a new “technical character” or “further technical effect” approach. In Microsoft the Board accepted the patentability of a software patent directed to a clipboard function, in which Microsoft claimed “a method in a computer system” and a “computer-readable medium having computer-executable instructions.” As recited by the Board, this “technical character”
approach follows from an interpretation of Articles 52(1) and 52(2-3) as distinct provisions. The approach more clearly defined what is essentially a two-part test comprised of independent (1) “technicality” and (2) “inventiveness” inquiries. Whereas the “contribution approach” conflated the two provisions by asking the examiner to determine an item’s novelty in the context of previously patentable fields, the “technical character” test maintained the distinction between an invention’s “technicality” and its “inventiveness.”

According to the Board’s formulation of the “technicality” component of the “technical character” approach, the invention must solve a technical problem by technical means, or in the alternative, produce a “further technical effect.” The Board found that a pure recitation of a hardware embodiment is sufficient to establish “technical character” on its own. An invention’s interactions between hardware and software are sufficient to establish a “further technical effect” if these interactions are more than those which would naturally arise from the implementation of software in the abstract, or a computer program “as such.” In Microsoft, the method presented a technical problem (enhancing the internal operation of a computer) and a technical means (a clipboard function using the system’s computer memory). The Board noted that the claim also satisfied the “further technical effect” test because “functional data structures (clipboard formats) [were] used independently of any cognitive content in order to enhance the internal operation of a computer system with a view to facilitating the exchange of data among various

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55. See id. at 9-10.
56. See Shemtov, supra note 41, at 507-09.
57. Microsoft, T-0424/03, supra note 45, at 10; Referral G03/08, supra note 1, at 32-34.
58. Microsoft, T-0424/03, supra note 45, at 10-11. See Referral G03/08, supra note 1, at 32-34.
59. Microsoft, T-0424/03, supra note 45, at 9-10.
application programs." Thus, under the "technical character" test of Microsoft, a software invention that would have been unpatentable under the prior "contribution approach" because its sole contribution to "inventiveness" was within an excluded field, was held patentable by the Board because the invention's features, in their entirety, were technical in character.

3. **BBC: A Potential Physical Effect Test**

In addition to defining what subject matter may contribute to the required "technical character," Boards of Appeal have explored whether a method's effect on a physical, real world object renders it patentable, an analysis that is akin to the American "machine-or-transformation" test discussed in Part II-C-3 below. In BBC, the Board considered the patentability of a television signal used to generate a wide-aspect-ratio picture. Although the Board considered the argument that the television signal could be considered a presentation of information, excluded under Articles 52(2)(d) and (3), it ultimately found that it was more "than a mere presentation of information 'as such.'" The Board found that this signal "inherently comprises the technical features of the T.V. system in which it is being used and if it is considered to present information then it represents exactly that kind of information which exhibits the technical features of the system in which it occurs." Thus, the signal would not be excluded because "it is a physical reality which can directly be detected by technological means and, therefore, cannot be considered as an abstract entity, despite its transient character."

The Board confronted a similar problem in Mitsubishi. In that

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60. *Id.* at 10 (internal citations omitted). *See Referral G03/08, supra* note 1, at 32-34.

61. *See Microsoft, T-0424/03, supra* note 45, at 11 ("The subject-matter of claim 5 has technical character since it relates to a computer-readable medium, i.e. a technical product involving a carrier. Moreover, the computer-executable instructions have the potential of achieving the above-mentioned further technical effect of enhancing the internal operation of the computer, which goes beyond the elementary interaction of any hardware and software of data processing.") (internal citations omitted); *Shemtov, supra* note 41, at 509.

62. *BBC, T-0163/85, supra* note 46, (quoting the first claim) ("A colour television signal adapted to generate a picture with an aspect ratio of greater than 4:3, and in which the active-video portion of a line constitutes at least 85% and preferably 90% of the line period.").

63. *Id.*

64. *Id.*

65. *Id.*

66. *Case T-0190/94, Image rotating system having an arbitrary angle/Mitsubishi, 14-15 (Oct. 26, 1995) [hereinafter Mitsubishi] (noting that an otherwise unpatentable algorithm for rotating an image by an arbitrary angle avoided exclusion because it "manifests itself in the real world in a technical effect on a physical entity").
case, the claim in question recited a system for rotating an image by an arbitrary angle by means of an algorithm. The appellant argued that the contribution made to the art by the difference between the claimed invention and the prior art was solely due to the mathematical algorithm. The Board rejected this reasoning:

[T]he quantitative effects on the image pixels in terms of rotation angles, in the third skew transformation and consequently in its quantitative relationship with the other two transformations within the overall rotation of the image, do not appear to be the same in the claimed as in the known system, the difference between these two systems manifests itself in the real world in a technical effect on a physical entity. [..] The claimed system thus making a contribution to the art in a field not excluded (by Article 52(2)/(3) EPC) from patentability, the subject-matter of the Claim is to be regarded as an invention within the meaning of Article 52(1)

67. Id. at 4-6 (citing the first claim):
A system for rotating an image by an arbitrary angle comprising:
an image memory for storing two-dimensional image data (121);
a transformation angle determining section (111) for determining both a skew angle (Tx) in a horizontal direction and a skew angle (Ty) in a vertical direction of the original two-dimensional image data stored in said image memory, based on a desired rotation angle (T);
a first X-axis skew transformation section (112) for obtaining second two-dimensional image data (122) which results from skewing first two-dimensional image data stored in said image memory as the original two-dimensional image data in a horizontal direction by the angle as determined by said transformation angle determining section;
a Y-axis skew transformation section (113) for obtaining third two-dimensional image data (123) which results from skewing said second two-dimensional image data in a vertical direction by the angle as determined by said transformation angle determining section; and
a second X-axis skew transformation section (114) for obtaining fourth two-dimensional image data (124) which results from skewing said third two-dimensional image data in a horizontal direction once again by the angle as determined by said transformation angle determining section;
- wherein the skew transformation for implementing the rotation processing is performed with skew transformation matrices represented by the following equations without needing arithmetic operations of affine transformation:

\[
\begin{pmatrix}
1 - \tan T/2 & 0 \\
?1 & ?3
\end{pmatrix}
\]

and

\[
\begin{pmatrix}
0 & 1 \\
?2 & ?4
\end{pmatrix}
\]

- where \( ?1 \), \( ?3 \) represent the first and second skew transformation in the X-direction and where \( ?2 \) represents the skew transformation in the Y-direction and wherein the rotation angle (T) is determined from the equations:

\[
T_x = T/2 \text{ and } T_y = \arctan(\sin T).
\]

68. Id. at 9-10.
The Board was quick to find that this physical effect on a real world object served to avoid statutory exclusion; but, as seen in the President’s referral to the EBoA (discussed in more detail below), there was a lingering question whether such physical effect was necessary, or merely a sufficient means of achieving a “technical effect.”

Despite the uncertainty surrounding a physical effect requirement, the end result of evolving EPO jurisprudence was that the patentability inquiry was largely pro forma. If it is sufficient for patentability to recite “technicality” (claim that the invention includes some technical feature) even if the feature does not predominate, then the “inventiveness” component provides the principal tool to determine patentability. In this way, the “technical character” test sidesteps the exclusion for software in Article 52, establishing a patentability doctrine in which all computer programs are patentable, provided that their claims are suitably inventive.

4. Confusion and Referral to the EPO’s Enlarged Board of Appeal

As the EPO actively reinterpreted EPC Article 52 in an attempt to grapple with new technologies, national courts across Europe struggled to harmonize their jurisprudence with the EPO’s shifting paradigm. For example, in Aerotel, the Court of Appeal in the United Kingdom noted its discomfort with disparate EPO case law and implored the President to initiate a referral to the EBoA:

The decisions of the EPO Boards of Appeal are mutually contradictory.... [S]urely the time has come for matters to be clarified by an Enlarged Board of Appeal. Under Art. 112(1)(b) of the EPC the President of the EPO has the power to refer a point of law to an Enlarged Board where two Boards of Appeal have given different points of view.

Not long after Aerotel, the EPO President, pursuant to EPC Article

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69. Id. at 15 (emphasis added).
70. See discussion infra Part I-4.
72. See Microsoft, T-0424/03, supra note 45.
112(1)(b), filed a referral with the EBoA claiming that the recent EPO interpretations regarding software patents represented divergent “application[s] of the law” in an area of “fundamental importance.” The Referral posed four questions related to the patentability of software, tackling the most controversial issues.

On May 12, 2010, the EPO EBoA handed down an opinion on Referral G 03/08, concluding that EBoA need not resolve a conflict in case law. The EBoA attributed the confusion expressed by national courts to the Technical Boards’ different interpretation of the different claim language. The perceived divergence was not evidence of judicial inconsistency but represented a legitimate development in an evolving body of law. As the EBoA may only rule to correct inconsistencies, it determined that in the absence of divergent case law, the President’s referral was improper. Accordingly, the EBoA

75. See Referral G03/08, supra note 1, at 1.
76. See id. at 24-51 (questions 1-4).
1) Can a computer program only be excluded as a computer program as such if it is explicitly claimed as a computer program?
2) (a) Can a claim in the area of computer programs avoid exclusion under Art. 52(2)(c) and (3) merely by explicitly mentioning the use of a computer or a computer-readable storage medium?
   (b) If Question 2(a) is answered in the negative, is a further technical effect necessary to avoid exclusion, said effect going beyond those effects inherent in the use of a computer or data storage medium to respectively execute or store a computer program?
3) (a) Must a claimed feature cause a technical effect on a physical entity in the real world in order to contribute to the technical character of the claim?
   (b) If Question 3(a) is answered in the positive, is it sufficient that the physical entity be an unspecified computer?
   (c) If Question 3(a) is answered in the negative, can features contribute to the technical character of the claim if the only effects to which they contribute are independent of any particular hardware that may be used?
4) (a) Does the activity of programming a computer necessarily involve technical considerations?
   (b) If Question 4(a) is answered in the positive, do all features resulting from programming thus contribute to the technical character of a claim?
   (c) If Question 4(a) is answered in the negative, can features resulting from programming contribute to the technical character of a claim only when they contribute to a further technical effect when the program is executed?

77. See id. at 17 (“Development of the law is an essential aspect of its application, whatever method of interpretation the judge applies, and is therefore inherent in all judicial activity. In that light an element of legal development can even be seen whenever a specific case is subsumed under an abstract regulation. That is especially true of Anglo-Saxon law, where a decision on an individual case has far greater implications as a precedent than judgments in continental civil law. Consequently, legal development as such cannot on its own form the basis for a referral, only because case law in new legal territory does not always develop in linear fashion, and earlier approaches may be abandoned or modified.”).
78. See id. at 18-20.
79. See id. at 26 (noting that the recognition that the claim form was relevant, allowing recitation of “technicality” by claiming a physical embodiment, was a legitimate development in the law) (citing Microsoft, T-0424/03 (2006)).
80. See id. at 48, 50.
devoted a majority of the opinion to a discussion of EPC referral procedure.

At first blush, this result appears neutral, but the text of the opinion signals support for the liberal “technical character,” two-step approach, and a rejection of the increasingly antiquated physicality requirements. The Referral consisted of four questions, two of which are relevant to this Article: (1) can a claim sidestep exclusion by merely reciting “technicality”; and (2) must a claimed feature act on a real world physical object in order to cause a “technical effect” that contributes to “technical character”? In its answer to the President’s questions, the EBoA struck a progressive chord, explicitly noting the need for evolving standards in such a volatile field:

Particularly in the field of new technologies, the Technical Boards often have to subject their established case law to critical review . . . . It is entirely conceivable that the interpretation of undefined legal terms in the light of the EPC’s purpose and principles will necessitate drawing further distinctions which, depending on what they include or exclude, may determine whether a patent is granted or refused in a specific case. [...] Thus even a radical shift in jurisprudence need not necessarily be construed as a different decision within the meaning of Article 112(1)(b) EPC vis-à-vis earlier case law, provided that the Board corrects itself and - mostly in explicit fashion - declares its earlier practice to be no longer relevant.

Addressing the President’s concern that the subject-matter patent exclusions could be easily avoided merely by reciting “technicality” in the patent application, the EBoA noted that while an earlier decision considered the manner of the claim to be irrelevant, a more recent decision highlighted the importance of claim form. The Microsoft decision held that simple recitation of embodiment in a

81. See EBoA Confirms EPO Approach to Computer Programs, May 12, 2010, EUROPEAN PATENT OFFICE, http://www.epo.org/topics/news/2010/20100512.html. Indeed, the EPO touted the decision as a confirmation of recent EPO computer jurisprudence. Id. One commentator noted that the result left the EPO “jubilant.” See Florian Mueller, German High Court Declares All Software Potentially Patentable, FOSS PATENTS BLOG 5 (May 19, 2010), http://foss_patents.blogspot.com/2010/05/german-high-court-declares-all-software.html.

82. See Referral G03/08, supra note 1, at 24, 48. Question 2 of the referral, not discussed in this article, raised a question about a divergent treatment of “computer programs” and “computer-implemented” methods. The Enlarged Board rejected the contention that a computer program and a computer-implemented method are the same thing and thus ruled that there was no divergence. See David Sant, Nick Beckett & Isabel Davies, Patentability of Computer Programs: EPO Referral Held by Enlarged Board to be Inadmissible, MONDAQ, May 25, 2010, http://www.mondaq.com/article.asp?articleid=101266.

83. See Referral G 03/08, supra note 1, at 18-19.

84. See id. at 26 (citing IBM, T-1173/97 (1998)).

85. See id. (citing Microsoft, T-0424/03 (2006)).
physical medium is sufficient to avoid exclusion under EPC Article 52(2). As the EBoA explained:

*Microsoft* . . . [came] to the conclusion that a claim to a program . . . on a computer-readable medium . . . necessarily avoids exclusion . . . [because] the subject-matter of [the claim] . . . relates to a computer-readable medium. [ . . .] This statement is quite unequivocal and stands alone as a reason for the claim not to be excluded under Article 52(2) EPC.

In answering the President’s question, the EBoA, though recognizing that there appeared to be differing case law regarding the presentation of claims for a computer program, found that the divergence represented a legitimate development in the law. Whereas claimants were previously required to show “technicality,” they are now required only to state such. Essentially gutting the initial “technicality” determination, the Board promoted the more adaptable “inventive step” requirement that assesses the software invention on its merits.

In the EBoA’s answer to the President’s question regarding a “technical effect” on a physical entity, it further endorsed a permissive approach. Citing *BBC* and *Mitsubishi*, discussed above, the President’s Referral asked whether the prior Board decisions required a physical effect. The EBoA simply rejected the contention that these cases instituted such a requirement:

The second problem with the alleged divergence is that the decisions T 163/85 and T 190/94, said in the referral to require a technical effect on a physical entity in the real world, simply did not do so. They merely accepted this as something sufficient for avoiding exclusion from patentability; they did not state that it was necessary.

This determination was a remarkable shift from the “contribution approach” and embraced the possibility that a particular software program may exhibit sufficient “technicality” without recitation of a

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86. *Id.*
87. *Id.* at 33 (citing *Microsoft*, T-0424/03, *supra* note 45).
88. *Id.* at 26 (citing *Microsoft*, T-0424/03, *supra* note 45).
89. See *id.* at 42 (praising *Duns Licensing*, T 154/04, *supra* note 71, and the “inventive step” requirement as a “practicable system for delimiting innovations for which a patent may be granted.”).
90. *Id.* at 48-50 (citing *BBC*, T-0163/85, *supra* note 46, and *Mitsubishi*, *supra* note 66).
91. *Id.* at 50.
hardware embodiment.92

Continuing to reference a permissive approach to patentability, in an unrelated section of the opinion, the EBoA sua sponte took the opportunity to clarify the “further technical effect” approach adopted in IBM.93 Specifically, the EBoA noted that the mere act of running software on a computer does not afford a software program sufficient “technical effects” to overcome exclusion because such a rule would render “software as such” patentable.94 Anything beyond this most basic interaction, however, would presumably qualify as a “further technical effect,” rendering the program patentable under the EPC.

Thus, while the EBoA’s opinion stops short of setting out a definitive rule to govern software patenting, it was a resounding reaffirmation of the need for a flexible approach to patentability in the face of quickly changing technology. Emanating from the Referral’s underlying rationale are key insights to the treatment of software inventions that signal a permissive and adaptable European patentability doctrine. The EBoA endorsed the liberal two-step approach of recent Boards of Appeal which relegated the exclusion test to a near-formality that can be surpassed by mere recitation of “technicality” and lets the more flexible “inventive step” test act as a filter.95 Additionally, the EBoA confirmed that a physical impact on a real world object is merely sufficient, and not necessary to provide a “technical effect” and avoid exclusion under Article 52(2).96

By adopting a methodology that essentially reads out of the analysis a rigid “technicality” step and places great emphasis on the more flexible and dynamic “inventiveness” step, the Board has set out an analysis that preserves flexibility in the face of evolving technologies while promoting the patenting of only inventive discoveries. Software patents are to be judged on their merits and not by a rigid and artificial bright-line rule.97 A recent German High

92. Note the striking similarity to Bilski’s holding that the “machine-or-transformation” test is sufficient but not necessary to render a process patentable over the abstract idea exclusion. Bilski v. Kappos, 130 S.Ct. 3218 (2010).
93. IBM, T-1173/97, supra note 42, at 26 (the claim in IBM that the Board determined to be patentable was for a computer program product, directly loaded onto the memory of a computer, that carries out a method for resource recovery inside the computer).
94. Id. at 16.
95. See id. at 14-15.
96. See id. at 14.
97. See Referral G 03/08, supra note 1, at 42 (praising Duns Licensing, T 154/04, supra note 71, and the “inventive step” requirement as a “practicable system for delimiting innovations for which a patent may be granted.”).
Court opinion,\textsuperscript{98} \textit{Siemens} (discussed below) is evidence that national courts are in fact adhering to the EPO’s recommended approach.\textsuperscript{99}

\textbf{E. The German High Court Follows the Lead of the EPO}

The development of EPO jurisprudence that effectively disregards the “technicality” requirement for patentability, and relies instead on the remaining requirements of novelty and “inventiveness,” could arguably be dismissed as unique to this singular patent organization. But a recent opinion from a German court signals that national courts are also willing to adopt this approach. In \textit{Siemens}, the German High Court considered a method for dynamically generating structured documents in resource-limited host computers or servers.\textsuperscript{100} Consistent with the latest EPO

\textsuperscript{98} The official name for Germany’s court of last resort for civil and criminal matters is the Federal Court of Justice (“Bundesgerichtshof”).

\textsuperscript{99} \textit{See} Case Xa ZB 20/08 (“Dynamische Dokumentengenerierung”) at 16, Bundesgerichtshof [BGH] [Federal Court of Justice] Apr. 22, 2010, Entscheidungen des Bundespatentgerichts [BPatGE] [F.R.G.], available at http://juris.bundesgerichtshof.de/cgibin/rechtsprechung/document.py?Gericht=bgh&Art=en&sid =c3af129057d2a2b17474357d41370cc&nr=51989&pos=0&anz=1 [hereinafter \textit{Siemens}]. All discussions of the opinion and quotes from the same are based on an unofficial English translation of the German High Court’s opinion.

\textsuperscript{100} \textit{Id.} at 4-5.

1. The patent application on which the appeal is based relates, according to its Patent Claim 1, to a method for dynamically generating structured documents, (1) which is carried out on at least one microcontroller-based host computer (1.1) that has limited resources and (1.2) that communicates with a client, (2) comprising the following method steps: (2.1) requirement data from the client is received at the host computer, (2.2) request parameters are extracted from the requirement data, (2.3) the request parameters are mapped by a control module to a command set of an interface module of the host computer, (2.3.1) with the interface module being software-architecture-specific, (2.4) the structured document is generated dynamically (2.4.1) using at least one template document that contains calls of service takers, (2.5) with instructions of the service takers being extracted by the interface module and mapped to a corresponding command set of the interface module, (2.5.1) with the command set being limited to a subsection of the service takers, (2.6) the instructions (2.6.1) are executed in a runtime environment of the control module with reference to the mapped request parameters and (2.6.2) define contents and/or structure of the structured document after execution is completed, (2.7) the dynamically generated structured document is transferred to the client.
jurisprudence, the German court applied a two-step patentability inquiry that asks first whether the claimed invention poses a technical solution to a technical problem. The lower court found that although the invention solved a technical problem (enabling structured documents to be dynamically generated on host computers with limited capacity), it did not disclose a technical solution because the method was based on "conceptual considerations that led to the proposal of providing a specific software module and, in this way, optimizing the system-near software." Rejecting this formulation of "technical character," the German High Court noted that the technical means or problem can be met by recitation of a data processing unit, and that the technical solution requirement will be satisfied if a computer program takes into account the features of the components on which the method is intended to run:

A technical means for solving a technical problem does not only exist if device components are modified or addressed in a fundamentally different matter. Instead, it is sufficient if the routine of a data processing program that is used for solving the problem is determined by technical circumstances outside of the data processing unit and if the solution consists in the very fact that a data processing program is designed such that it takes into account the technical circumstances of the data processing program.

The court found that whether the claim is drafted in an abstract manner, and not confined to concrete measures of a limited command set, is not a concern of patentability, but rather a consideration to be analyzed under the remaining patentability requirements of novelty and "inventiveness." Thus, under the guidance of the German High Court, essentially all computer-implemented software programs are potentially patentable because, in practice, all programs must take into account the different properties and performance of hardware and software components.

101. Id. at 13-14. See also Mueller, German High Court Declares All Software Potentially Patentable, supra note 81 (noting the previous strict rule: "a patented invention to put 'controllable forces of nature' to use to achieve a predictable effect. Software all by itself can't do that, so that principle only allowed software to be part of a traditional technical invention.").
102. Siemens, case Xa ZB 20/08, supra note 99, at 15.
103. Id. at 13.
104. Id. at 15-16.
105. Id. at 16 ("That the teaching is not limited to the concrete measures for mapping request parameters to a limited command set, but rather is formulated abstractly, is to be taken into consideration in the still remaining examination of novelty and inventive step.").
106. See id. at 15-16. See also Mueller, German High Court Declares All Software Potentially Patentable, supra note 81.
The European patent system, at the intra-national and increasingly the national level, is now guided by a two-step patentability inquiry in which claims clear the initial exclusionary “technicality” hurdle by mere recitation of “technicality,” and the second “inventiveness” component performs the heavy-lifting in denying unworthy inventions the protection of the patent laws. Is the methodology a clever construct of activist European jurists or the natural resting place of any patentability analysis that seeks to accommodate the unpredictable pace and direction of invention in the Information Age? A close analysis of the evolution of “patentable subject matter” jurisprudence in the United States suggests an answer. In America, jurists apply a fundamentally different minimalist judicial philosophy to decades-old statutes and centuries-old case law, yet reach essentially the same result.

II. JUDICIAL MINIMALISM: BEHIND THE CURTAIN OF TEXTUAL PATENTABILITY IN THE UNITED STATES

Nearly contemporaneously with their European counterparts, courts in the United States confronted the same difficulties reconciling antiquated notions of patentability with the rapidly transforming world of information technology. In the years leading up to the Supreme Court’s pronouncement in *Bilski*, the United States Court of Appeals for the Federal Circuit (the “Federal Circuit”), pursued a path of patent jurisprudence that sought to address the patentability of mutable technologies through a judicially-created evolving series of bright-line tests. In recent years, the Federal Circuit weathered a storm of political and public criticism for its perceived activism. Increasingly, the Supreme Court has weighed in on a number of patent topics that were previously considered the exclusive purview of the Federal Circuit. With its decision in *Bilski*, the Supreme Court, for the first time since Congress established the Federal Circuit, addressed the question of patentability and rejected the Federal Circuit’s bright-line tests. The Supreme Court refreshed a minimalist approach to statutory interpretation that broadly construed the categories of “patentable subject matter” in § 101 of the Patent Act and restrictively applied traditional conditions and requirements to patentability codified in other provisions of the statute.

107. See generally, e.g., State St. Bank & Trust Co. v. Signature Fin. Grp., 149 F.3d 1368 (Fed. Cir. 1998); In re Comiskey, 499 F.3d 1365 (Fed. Cir. 2007); In re Nuijten, 500 F.3d 1346 (Fed. Cir. 2007); In re Bilski, 545 F.3d 943, 959 (Fed. Cir. 2008).
A. Section 101 of the Patent Act and Common-Law Exceptions

At the heart of the American doctrine of "patentable subject matter" is § 101 of the United States Patent Act: "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."\(^{109}\) The Patent Act further defines the term "process": "[t]he term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."\(^{110}\) Three extra-textual exceptions, arising from long-established Supreme Court case law, bind § 101's permissive statutory basis of "patentable subject matter."\(^{111}\) These common-law exclusions consist of the familiar categories of (1) laws of nature, (2) physical phenomena, and (3) abstract ideas.\(^{112}\)

B. Benson, Flook, and Diehr: The Supreme Court Sketches the Contours of Patentability

In a trilogy of cases that form the foundation of Supreme Court patentability analysis, the Court clarified the limitations that the three extra-textual exclusions place on the scope of patentable processes.\(^{113}\) In 1972, the Court issued the first of these opinions, *Gottschalk v. Benson*.\(^{114}\) The patent in *Benson* claimed an algorithm for converting binary-coded decimal numbers into pure binary numbers.\(^{115}\) The conversion between these two systems can be done mentally in successive steps of multiplication and addition.\(^{116}\) The Court held that the claim at issue was not a process, but an unpatentable abstract


\(^{111}\) *Bilski v. Kappos*, 130 S.Ct. 3218, 3225 (2010). ("The Court's precedents provide three specific exceptions to § 101's broad patent-eligibility principles: 'laws of nature, physical phenomena, and abstract ideas.' While these exceptions are not required by the statutory text, they are consistent with the notion that a patentable process must be 'new and useful.' And, in any case, these exceptions have defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years.") (internal citations omitted).

\(^{112}\) *Id.*

\(^{113}\) See generally *Gottschalk v. Benson*, 409 U.S. 63, 64-67 (1972) ("[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"); *Parker v. Flook*, 437 U.S. 584 (1978) (the exclusion of abstract ideas from patentable subject matter cannot be circumvented by limiting the formula to a particular field or by insignificant postsolution activity); *Diamond v. Diehr*, 450 U.S. 175, 187 (1981) (while abstract ideas are not patentable, "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection").

\(^{114}\) *Benson*, 409 U.S. at 63.

\(^{115}\) *Id.* at 67, 71, 73.

\(^{116}\) *Id.* at 66-67.
idea.\textsuperscript{117} Allowing a patent on the claim in question, the Court explained, "would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself."\textsuperscript{118}

Six years later, in 1978, the Court again considered the patentability of processes in \textit{Parker v. Flook}.\textsuperscript{119} The \textit{Flook} patent claimed a procedure for monitoring the catalytic conversion process in the petrochemical and oil-refining industries.\textsuperscript{120} This process consisted of three steps: a temperature measurement, the calculation of an updated alarm limit with an algorithm, and the adjustment of the alarm limit with the calculated new value.\textsuperscript{121} The Court noted that, unlike the process in \textit{Benson}, the \textit{Flook} patent would not wholly preempt the use of the algorithm in question because it was limited to specific industries, but that the algorithm was the application's only innovation.\textsuperscript{122} Noting that issuing a patent based on these limitations would be exalting form over substance, the Court rejected "[t]he notion that post-solution activity [in this case the adjustment of the alarm limit to the figure computed according to the formula], no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process."\textsuperscript{123} Thus, \textit{Flook} stands for the proposition that the prohibition against patenting abstract ideas "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment . . . [or by adding] insignificant postsolution activity."\textsuperscript{124}

Finally, in 1981, the Court issued its opinion in \textit{Diamond v. Diehr}, limiting and clarifying the principles laid out in \textit{Benson} and \textit{Flook}.\textsuperscript{125} Considering an application claiming a process for curing rubber that used a mathematical formula to complete certain steps in the process, the Court explained that while an abstract idea, law of nature, or mathematical formula could not be patented, "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."\textsuperscript{126} In \textit{Diehr}, the Court held that the claim for a rubber-curing process fell within the scope of "patentable subject matter" because it claimed an

\begin{itemize}
\item\textsuperscript{117} \textit{Id.} at 71-72.
\item\textsuperscript{118} \textit{Id.} at 72.
\item\textsuperscript{119} \textit{Parker v. Flook}, 437 U.S. 584 (1978).
\item\textsuperscript{120} \textit{Id.} at 585-86.
\item\textsuperscript{121} \textit{Id.} at 585.
\item\textsuperscript{122} \textit{Id.} at 585, 589-90, 594-95.
\item\textsuperscript{123} \textit{Id.} at 590.
\item\textsuperscript{125} \textit{Diehr}, 450 U.S. 175.
\item\textsuperscript{126} \textit{Id.} at 187.
\end{itemize}
application of a mathematical formula rather than the mathematical formula itself.127

Thus, by the early 1980s, the Court had laid the groundwork of a flexible "patentable subject matter" doctrine and described in broad strokes the contours of the analysis. In practice, however, drawing a line between the principles of Benson and Flook and the limitation of Diehr proved difficult.128 For several decades following Diehr, lower courts repeatedly and unsuccessfully attempted to distill the Court's guidance into a concrete framework.129

C. The Federal Circuit Attempts to Craft a Bright-line Test from the Supreme Court's Holdings

Congress created the Federal Circuit in 1982 to bring uniformity and predictability to the laws that govern the grant and enforcement of patents.130 Since that time, the Federal Circuit has overseen the expanded protection of patents and the implementation of predictable rules to define the scope of patentability and the reach of patent holders' rights.131 The Federal Circuit is unique among the Courts of Appeal in the United States as the only court that claims jurisdiction based wholly upon subject matter rather than geographic location.132 In the United States, patent cases are subject to exclusive federal jurisdiction under 28 U.S.C. §1338(a). An action for patent infringement may be filed in any District Court, subject to applicable

127. Id. at 192-93.
128. See e.g., State St. Bank & Trust Co. v. Signature Fin. Grp., Inc., 927 F. Supp. 502, 507-508 (D. Mass. 1996) (Struggling with the concepts laid out in Benson and Diehr: "This distinction between abstract idea an patentable subject matter, however, is more easily stated than applied. . . . The determination of patentability of computer software is particularly difficult because a computer program directs the computer to perform mathematical functions (i.e., process data) to achieve a desired result."); Schlafly v. Pub. Key Partners, 1997 WL 542711, *4 (N.D. Cal. Aug. 22, 1997) ("This concept, that laws of nature, natural phenomenon and abstract ideas are not patentable, is difficult to apply in the context of computer-related technology. However, some guidance can be found in Supreme Court and Federal Circuit cases."); GMIS, Inc. v. Health Payment Review, Inc., 1995 WL 27148, *1 (E.D. Pa. Jan. 19, 1995) (describing the theories of patentability in Diehr and Benson as "radically divergent"); Arrhythmia Research Tech., Inc. v. Corazonix Corp., 958 F.2d 1053, 1066 (Fed. Cir. 1992) (Rader, J., concurring) ("The district court granted summary judgment in favor of Corazonix because the claims of the '459 patent are drawn to a nonstatutory mathematical algorithm and, as such, are unpatentable pursuant to the provisions of 35 U.S.C. § 101." This erroneous conclusion illustrates the confusion caused by Benson and its progeny.").
132. See id.
jurisdiction and venue constraints. Thereafter, patent cases diverge from the route taken by non-patent federal cases and are appealable only to the Federal Circuit. Following a Federal Circuit decision, parties may petition for review to the Supreme Court as a court of last resort. In the first twenty years of the Federal Circuit, the Supreme Court rarely reviewed patent cases and left to the Federal Circuit the task of developing patent-specific case law. During this period of Supreme Court silence, the Federal Circuit was the de facto court of last resort for patent cases in the United States. Building on the existing body of Supreme Court precedent—primarily the holdings of Benson, Flook, and Diehr—the Federal Circuit created a series of extra-statutory “tests” designed to delineate the reach of § 101.

1. The Freeman-Walter-Abele Test

The Freeman-Walter-Abele test, created by the United States Court of Customs and Patent Appeals, a predecessor court to the Federal Circuit, was the first of these tests. It described a two-step process for determining whether a patent using a mathematical algorithm was patentable: “(1) determining whether the claim recites an ‘algorithm’ within the meaning of Benson, then (2) determining whether that algorithm is ‘applied in any manner to physical elements or process steps.’” The test was problematic because, contrary to Supreme Court precedent, it explicitly prevented courts from evaluating claims as a whole and introduced the possibility that claims would be rejected based on individual elements and limitations. The Federal Circuit later found this test unworkable and fashioned a replacement.

135. See SUP. CT. R. 10.
137. See id. (“In recent years, the Supreme Court has tended to grant no more than about ninety petitions from the several thousand filed in each year-long term. According to my tally, in any term out of the last twenty-five, no more than three such grants have been directed to patent questions.”).
140. In re Bilski, 545 F.3d 943, 959 (citing In re Abele, 684 F.2d 902 (C.C.P.A. 1982)).
141. See id.
142. See State St., 149 F.3d at 1374 (“After Diehr and Chakrabarty, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter. As we pointed out in Alapat, . . . application of the test could be misleading, because a process, machine, manufacture, or composition of matter employing a law of nature, natural
2. State Street Bank: The "Useful, Concrete, and Tangible Result" Test

State Street Bank, a case notorious for its judicial activism, introduced two controversial ideas. First, the Federal Circuit articulated a new patentability test that looked to whether the process produced a "useful, concrete, and tangible result." Second, the Federal Circuit determined in State Street that business methods are patentable processes, opening the flood gates to subject matter previously thought to be beyond the scope of patent protection.

Over the next decade, the Federal Circuit modified its pronouncement in State Street slightly, but the overall framework remained intact. In 2007, the Federal Circuit issued two opinions slightly constricting the scope of patentability. In re Comiskey, the court considered a business method claim directed to a mandatory arbitration process that covered a series of steps performed by human beings. The court ruled that such claims were unpatentable mental processes, but held that other claims that added the additional requirement of using a computer to execute the process were patentable under the "useful, concrete, and tangible result" test. In re Nuijten, the patent at issue claimed a technique for reducing the distortion of electronic signals caused by electronic watermarking. For example, claim 14 was directed to "[a] signal with embedded supplemental data, the signal being encoded in accordance with a given encoding process . . . ." In rejecting the claim as
unpatentable, the Federal Circuit held that electrical or electromagnetic signals are not statutory subject matter under the Patent Act.  Thus, the Federal Circuit slightly recast and narrowed the rule set forth in *State Street* but preserved the overall structure of the analysis.

3. *In re Bilski*: The “Machine-or-Transformation” Test

A decade after *State Street*, the Federal Circuit once again found its earlier pronouncement unsatisfactory and, in *In re Bilski*, introduced a more rigid patentability test. The Bilski patent claims a process that explains “how buyers and sellers of commodities in the energy market can protect, or hedge, against the risk of price changes.” Independent claims 1 and 4 of Bilski’s application explained the concept of hedging, and later dependent claims explained the use of hedging in energy markets. The Federal Circuit, sitting en banc, rejected the claims for failure to meet a newly defined “machine-or-transformation” test, which the court characterized as a requirement of patentability.

This “machine-or-transformation” test asks whether the process is “(1) . . . tied to a particular machine or apparatus, or (2) . . . transforms a particular article into a different state or thing.” The court seemingly took pains to ground its “machine-or-transformation”

supplemental data, and at least one of the samples preceding the selected samples is different from the sample corresponding to the given encoding process.

151. *Id.* at 1353 (citing *State St.*, 149 F.3d at 1375).
152. Kappos et al., supra note 143, at 166.
154. See *id.* (citing U.S. Patent Application No. 08/833,892 (filed Apr. 10, 1997)):

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

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

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

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

2. The method of claim 1 wherein said commodity is energy and said market participants are transmission distributors.

155. The Federal Circuit’s opinion actually consisted of five different opinions, including one concurrence and three dissents. See generally *In re Bilski*, 545 F.3d 943 (2008).
156. *Id.* at 954 (citing Gottschalk v. Benson, 409 U.S. 63, 70 (1972)).
157. *Id.*
test in Supreme Court precedent, citing extensively to Benson, Flook, and Diehr.\textsuperscript{158} Still, dissenting judges accused the majority of overstepping the bounds of its judicial authority and disregarding the Supreme Court's demands for judicial restraint found in several earlier Supreme Court patentability decisions.\textsuperscript{159} The dissenting judges' opinions proved prescient. The majority's efforts to avert another rebuke from the Supreme Court by drafting a scholarly opinion and exhaustively detailing past precedent\textsuperscript{160} proved unsuccessful.

\textbf{D. The Backlash Against Perceived Federal Circuit Activism}

After significantly expanding the scope of patentability and the power of patents in the decades of its supremacy, the Federal Circuit saw a recent sharp turn in public and political opinion reflected in both legislative and judicial activity. Congress has and continues to vigorously debate a broad amendment to the Patent Act that would restrict the scope of patent grants and protections.\textsuperscript{161} The American

\begin{itemize}
\item \textsuperscript{158} See id. at 956 ("Therefore, we believe our reliance on the Supreme Court's machine-or-transformation test as the applicable test for \textsection 101 analyses of process claims is sound." (citing Benson, Flook, and Diehr)).
\item \textsuperscript{159} See id. at 1012 (Rader, J., dissenting) ("[S]ection 101's term 'process' contains no hint of an exclusion for certain types of methods. This court today nonetheless holds that a process is eligible only if it falls within certain subsets of 'process.' Ironically the Patent Act itself specifically defines 'process' without any of these judicial innovations. 35 U.S.C. \textsection 100(b). Therefore, as Diehr commands, this court should refrain from creating new circuitous judge-made tests."); id. at 1011 ("Much of the court's difficulty lies in its reliance on dicta taken out of context from numerous Supreme Court opinions dealing with the technology of the past. In other words, as innovators seek the path to the next tech no-revolution, this court ties our patent system to dicta from an industrial age decades removed from the bleeding edge. A direct reading of the Supreme Court's principles and cases on patent eligibility would yield the one-sentence resolution suggested above."); id. ("Because Bilski claims merely an abstract idea, this court affirms the Board's rejection.").
\item \textsuperscript{160} See id. at 959-60 ("The second articulation we now revisit is the 'useful, concrete, and tangible result' language associated with State Street. . . . The basis for this language in State Street and Alappat was that the Supreme Court has explained that 'certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application.' To be sure, a process tied to a particular machine, or transforming or reducing a particular article into a different state or thing, will generally produce a 'concrete' and 'tangible' result as those terms were used in our prior decisions. But while looking for 'a useful, concrete and tangible result' may in many instances provide useful indications of whether a claim is drawn to a fundamental principle or a practical application of such a principle, that inquiry is insufficient to determine whether a claim is patent-eligible under \textsection 101. And it was certainly never intended to supplant 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."). (internal citations omitted).
\item \textsuperscript{161} See Patent Reform Act of 2010, Manager's Amendment to S. 515, 111th Cong. \textsection 100 (2010).
\end{itemize}
reform efforts, focused mainly on procedural changes, have triggered a political firestorm as well-funded interest groups on both sides of the most important issues enlist the help of sympathetic representatives on Capitol Hill. Perhaps because of the competing interests on the many sides of the debate, legislative reform of the Patent Act has proven to be a politically charged process. Both houses of Congress have addressed the issue of patent reform no less than four times in the past five years.

While Congress continues to debate patent-reform proposals, the Supreme Court has reasserted itself. Recent opinions have reshaped or discarded many rules announced by the Federal Circuit, including those relevant to obviousness, declaratory judgment actions, permanent injunctions, the patent exhaustion doctrine, and now with Bilski, the scope of patentability. In several of these decisions, the Court follows a decidedly minimalist bent, drawing back several of the Federal Circuit’s judicially-created doctrines with a view towards restricting the boundaries of the law to statutory or long-standing common-law roots. For example, in eBay, the Court rejected the Federal Circuit’s categorical test for permanent injunctions, declaring the test departed from long-standing


principles. Prior to eBay, as the Federal Circuit observed, it was "the general rule that an injunction will issue when infringement has been adjudged, absent a sound reason for denying it." But in all other cases, federal courts applied a traditional four-factor test when assessing a request for a permanent injunction. Invoking a minimalist rationale, the Supreme Court dismissed the Federal Circuit's categorical rule: "As this Court has long recognized, 'a major departure from the long tradition of equity practice should not be lightly implied.' Nothing in the Patent Act indicates that Congress intended such a departure. To the contrary, the Patent Act expressly provides that injunctions 'may' issue 'in accordance with the principles of equity.'"

This trend continued in subsequent Supreme Court cases in the patent area, including KSR, which similarly pared back Federal Circuit case law defining when an invention is unpatentable for obviousness. The Federal Circuit had earlier established a rule that required a party challenging a patent on obviousness grounds to demonstrate a "teaching, suggestion, or motivation" to combine known elements explicitly within the cited prior art references. But the Supreme Court rejected this mandatory formulation as inconsistent with the underlying patent statute and its long-standing precedent. Foreshadowing its decision in Bilski, the Court deployed a judicially minimalist methodology to create a more flexible obviousness rule:

"[t]he diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. [. . . ] Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the

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171. eBay, 547 U.S. at 391-92.
173. The four factor test: "(1) that [the patentee] has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction." See, e.g., eBay, 547 U.S. at 391 (internal citations omitted).
174. Id. at 391-92 (internal citations omitted).
176. Id. at 414, 418.
177. Id. at 415-16 ("We begin by rejecting the rigid approach of the Court of Appeals. . . . [O]ur cases have set forth an expansive and flexible approach inconsistent with the way the Court of Appeals applied its TSM test here. . . . For over a half century, the Court has held that a 'patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men.'") (quoting Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp., 340 U.S. 147, 152 (1950)).
case of patents combining previously known elements, deprive prior inventions of their value and utility.”

E. Bilski Redux: The Supreme Court Eliminates Another Bright-Line Test

In January 2009, Bilski petitioned the Supreme Court for a writ of certiorari seeking to overturn the Federal Circuit’s decision in In re Bilski. On June 1, 2009, the Court granted the petition and on June 28, 2010, over a year later, it handed down its opinion. Bilski reflects a Court divided by the controversial issues surrounding the patentability of new technologies. The Bilski ruling is composed of no less than three separate opinions, comprising a majority and plurality, along with two concurrences. Although the Supreme Court affirmed the ultimate determination that the patent in Bilski was invalid under § 101, the opinion rejected the Federal Circuit’s efforts to apply an extra-statutory, rigid framework to the flexible patentability inquiry.

1. The Bilski Majority and Plurality

Justice Kennedy, writing for the majority, focused closely on the text of the Patent Act and defined its terms using “ordinary, contemporary, common meaning.” He stated: “This Court has ‘more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not

178. Id. at 419.
182. Justice Scalia did not join sections II.B.2 and II.C.2 of Justice Kennedy’s majority opinion. Id. at 3223
183. Id. Justices Stevens, Ginsburg, Breyer, and Sotomayor took issue with the majority’s analysis of the “abstract idea” exclusion, as well as the ultimate conclusion that business methods are patentable in any form. Id. at 3231-32 (Stevens, J., concurring in judgment).
184. See id. at 3223-28. See also Steven Seidenberg, Standing by Its Flexible Standards, ABA JOURNAL, Aug. 1, 2010, available at http://www.abajournal.com/magazine/article/standing_by_its_flexible_standards/ (“Breyer, writing for himself and a fifth justice, Scalia, savaged the [Federal Circuit’s] test, writing that its application resulted in ‘the granting of patents that ranged from the somewhat ridiculous to the truly absurd.’ Because five justices are strongly against the State Street test, the Federal Circuit is unlikely to revive it, most experts agree.”).
185. Bilski, 130 S.Ct. at 3226 (quoting Diamond v. Diehr, 450 U.S. 175, 182 (1981)).
expressed.’ In patent law, as in all statutory construction, ‘[u]nless otherwise defined, words will be interpreted as taking their ordinary, contemporary, common meaning.’” Justice Kennedy observed that the “machine-or-transformation” test endorsed by the Federal Circuit appears nowhere in the statutory text of the Patent Act, stating that the test may provide a useful “clue” to patentability, but it cannot be the sole test of patentability.

In a plurality opinion, the Court explained the danger of relying solely on inflexible tests. In accord with the fundamentally liberal scope of §101, a rigid test not supported by the statute may prohibit unforeseen innovations of the Information Age. As a case in point, the opinion cites the development of software programs: “it was once forcefully argued that until recent times, ‘well-established principles of patent law probably would have prevented the issuance of a valid patent on almost any conceivable computer program.” Because the use of rigid tests would likely amount to a categorical ban on

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186. *Id.* (quoting *Diehr*, 450 U.S. at 182; *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (some internal quotation marks omitted)).

187. *Bilski*, 130 S.Ct. at 3226-27. Compare to the Enlarged Board of Appeals finding that a finding of a physical impact on a real world object may be sufficient but is not a necessary to avoid 52(2) exclusion. *Referral G03/08, supra* note 1, at 50.

188. Notably, Teles, a German high-technology company, submitted an amicus brief in *Bilski v. Kappos* which analyzed the patentability questions at issue from a European perspective. This analysis largely presaged the opinions of the plurality and the majority and argued that the law on patentability in the United States and Europe was in fact harmonized. Citing to statutory and long-standing precedent of the Supreme Court, Teles argued that standards for the patenting of processes should be broadly applied and dynamically considered, limited only by the three common-law exclusions of patentable subject matter. Foreshadowing the policy consideration cited by the plurality, Teles specifically cites the need for a flexible system that can accommodate cutting-edge technologies of a non-physical nature. Brief for Teles AG as Amicus Curiae Supporting Neither Party, at 2, 12, 15-16, *Bilski v. Kappos*, 130 S.Ct. 3218 (2010).

189. *Bilski*, 130 S.Ct. at 3227-28 (“A categorical rule denying patent protection for ‘inventions in areas not contemplated by Congress . . . would frustrate the purposes of the patent law.’ . . . Section 101’s terms suggest that new technologies may call for new inquiries.”) (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980); *Bilski*, 130 S.Ct. at 3227 (“Section 101 is a ‘dynamic provision designed to encompass new and unforeseen inventions.’”) (quoting *J. E. M. Ag Supply, Inc. v. Pioneer HiBred Int’l, Inc.*, 534 U.S. 124, 135 (2001)). Notably, the Enlarged Board of Appeal embraced the same logic in justifying the EPO’s ever-shifting jurisprudence regarding the patentability of new technologies. Cf. *Referral G03/08, supra* note 1, at 18-19 (“Particularly in the field of new technologies, the Technical Boards often have to subject their established case law to critical review . . . . It is entirely conceivable that the interpretation of undefined legal terms in light of the EPC’s purpose and principles will necessitate drawing further distinctions which, depending on what they include or exclude, may determine whether a patent is granted or refused in a specific case.”). The Supreme Court and the Enlarged Board clearly shared the same objective: developing a flexible methodology capable of recognizing new forms of innovation while preserving the integrity of the patent system.

190. *Bilski*, 130 S.Ct. at 3227 (quoting *Diamond v. Diehr*, 450 U.S. 175, 195 (Stevens, J., dissenting)).
otherwise viable, though unanticipated, inventions that the statutory
text could support, tests such as the "machine-or-transformation" test
are only useful indicators of patentability.\textsuperscript{191}

Having swept away decades of Federal Circuit precedent, the
Court analyzed Bilski's business method claim using the analytical
Framework provided by the foundational cases: \textit{Benson}, \textit{Flook}, and
\textit{Diehr}. The Court concluded that independent claims one and four of
the Bilski patent attempt to claim the concept of hedging—an
unpatentable, abstract idea.\textsuperscript{192} The remaining dependent claims
merely limit the abstract idea to a specific field of use or add "token
post-solution components:"\textsuperscript{193}

In light of these precedents, it is clear that petitioners' application
is not a patentable "process." Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting
against risk: "Hedging is a fundamental economic practice long
prevalent in our system of commerce and taught in any
introductory finance class." The concept of hedging, described in
claim 1 and reduced to a mathematical formula in claim 4, is an
unpatentable abstract idea, just like the algorithms at issue in
\textit{Benson} and \textit{Flook}. Allowing petitioners to patent risk hedging
would pre-empt use of this approach in all fields, and would
effectively grant a monopoly over an abstract idea.

Petitioners' remaining claims are broad examples of how hedging
can be used in commodities and energy markets. [\ldots] [T]hese
claims add even less to the underlying abstract principle than the
invention in \textit{Flook} did, for the \textit{Flook} invention was at least directed
to the narrower domain of signaling dangers in operating a
catalytic converter.\textsuperscript{194}

The Court also noted that Bilski's claims, if allowed, would pre-empt
the use of the abstract concept of hedging in all fields.\textsuperscript{195} In other
words, Bilski's claims suffer from the same flaw as the methods
claimed in \textit{Flook}.\textsuperscript{196} \textit{Diehr} established a limiting principle that
applications of abstract ideas or laws of nature may be patentable, but
the Court does not explain why the application of Bilski's claims to
energy market hedging is insufficient to satisfy this limiting principle,
other than to point out that this post-solution activity adds less than

\begin{itemize}
\item \textsuperscript{191} \textit{Id.} at 3225-28.
\item \textsuperscript{192} \textit{Id.} at 3231.
\item \textsuperscript{193} \textit{Id.} (citing Parker v. Flook, 437 U.S. 584 (1978)).
\item \textsuperscript{194} \textit{Id.} (internal citations omitted).
\item \textsuperscript{195} \textit{Id.}
\item \textsuperscript{196} \textit{Id.}
\end{itemize}
the claims in Flook.\textsuperscript{197}

In addition to ruling on the standard of patentability for process claims generally, the Court confronted the specific issue of the patentability of business methods. The Court held that at least some business method patents are patentable, but its analysis leaves the future viability of these patents in doubt.\textsuperscript{198} Continuing on its minimalist path, the Court drew on § 101 and applied strict principles of statutory interpretation. Because the term \textit{“method”} is within § 100(b)’s definition of \textit{“process,”} and it is not limited in any fashion, the Court acknowledged that the term may include some form of business methods.\textsuperscript{199} Further, the Court was “unaware of any argument that the ‘ordinary, contemporary, common meaning,’ of ‘method’ excludes business methods.”\textsuperscript{200} Also, according to the Court, § 273(b)(1), which provides a defense of prior use to the infringement of such patents, undermined an interpretation of the Patent Act that would categorically exclude business method patents from patentability.\textsuperscript{201} As the Court noted, a conclusion that business methods were not patentable under any circumstances “would render § 273 meaningless[,] violat[ing] the canon against interpreting any statutory provision in a manner that would render another provision superfluous.”\textsuperscript{202} The majority recognized the threshold patentability of business methods, but stopped short of pronouncing a broad scope of their patentability, noting that “while § 273 appears to leave open the possibility of some business method patents, it does not suggest broad patentability of such claimed inventions.”\textsuperscript{203} The plurality was far less enthusiastic about extending the patentability of business methods. It noted that, though the “Information Age empowers people with new capacities to perform statistical analyses and mathematical calculations [] for more efficient performance of a vast number of business tasks . . . [i]f a high enough bar is not set, . . . patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change.”\textsuperscript{204} It also suggested that if the Federal Circuit fashioned a narrower rule defining the scope of patentable business methods, it

\textsuperscript{197} See Bilski, 130 S.Ct. at 3229-31.
\textsuperscript{198} See id. at 3226-28.
\textsuperscript{199} Id. at 3228.
\textsuperscript{200} Id. (quoting Diamond v. Diehr, 450 U.S. 175, 182 (1981)).
\textsuperscript{201} Id.
\textsuperscript{202} Id. at 3228-29 (citing Corley v. United States, 129 S. Ct. 1558, 1566 (2009)).
\textsuperscript{203} Id. at 3229.
\textsuperscript{204} Id.
might be in accord with controlling precedent.\footnote{Id.}

2. The Bilski Concurrence

Justice Stevens, in his concurrence, agreed with the Court’s rejection of Bilski’s claim under § 101, but sharply attacked the majority’s interpretation of the term “process” and its holding that business methods are patentable.\footnote{See Bilski, 130 S.Ct. at 3231-58 (Stevens, J., concurring in judgment). This feeling is also reflected across the Atlantic where the idea of business method patents received a chilly reception. See Bray, supra note 9, ¶¶ 9-11 (citing Amendment 6 to the proposed EU Directive (see discussion infra Part I-B)).} More relevant to the topic of this Article, the Stevens concurrence scolded the Court for importing non-Section 101 inquiries into its “abstract idea” analysis:

[I]n its discussion of an issue not contained in the questions presented—whether the particular series of steps in petitioners’ application is an abstract idea—the Court uses language that could suggest a shift in our approach to that issue. […] It is true, as the Court observes, that petitioners’ application is phrased broadly. But claim specification is covered by § 112, not § 101; and if a series of steps constituted an unpatentable idea merely because it was described without sufficient specificity, the Court could be calling into question some of our own prior decisions. At points, the opinion suggests that novelty is the clue. But the fact that hedging is “long prevalent in our system of commerce,” cannot justify the Court’s conclusion, as “the proper construction of § 101 . . . does not involve the familiar issu[e] of novelty” that arises under § 102. At other points, the opinion for a plurality suggests that the analysis turns on the category of patent involved [(courts should use the abstract-idea rule as a “too[l]” to set “a high enough bar” “when considering patent applications of this sort”). But we have never in the past suggested that the inquiry varies by subject matter.\footnote{Bilski, 130 S.Ct. at 3235-26 (Stevens, J., concurring in judgment) (emphasis added) (internal footnote and citations omitted).}

Justice Stevens expressed concern that conflating the statutory requirements of patentability, as the majority opinion appears to, could signal a shift from the established analysis of the “abstract idea” exception.\footnote{Id. at 3235 (Stevens, J., concurring in judgment).}

In addition to faulting the majority for basing its conclusion on novelty and definiteness issues rather than “abstract idea” considerations, Stevens also noted that the majority did not provide a reasonable account of why Bilski’s claim is unpatentable under the
foundational cases of Benson, Flook, and Diehr:

Although I happen to agree that petitioners seek to patent an abstract idea, the Court does not show how this conclusion follows "clear[ly][[1]]" from our case law. The patent now before us is not for "[a] principle, in the abstract," or a "fundamental truth." Nor does it claim the sort of phenomenon of nature or abstract idea that was embodied by the mathematical formula at issue in [Benson] and in Flook. . . . The Court construes petitioners' claims on processes for pricing as claims on "the basic concept of hedging, or protecting against risk," and thus discounts the application's discussion of what sorts of data to use, and how to analyze those data, as mere "token postsolution components[.]." In other words, the Court artificially limits petitioners' claims to hedging, and then concludes that hedging is an abstract idea rather than a term that describes a category of processes including petitioners' claims. Why the Court does this is never made clear. 209

Although the Stevens concurrence expresses surprise and concern at these analytical flaws, such imprecision has long been a feature of Supreme Court jurisprudence on "patentable subject matter." 210 Indeed, as discussed in more detail in Part III, these perceived failings, both in applying the Court's precedent to "patentable subject matter" cases and in articulating a decision under purely "subject matter exception" terms, disguise an underlying consistency in the Court's jurisprudence.

In Bilski, the Supreme Court merely refined the flexible test for patentability that it has been using since Benson. Still, the opinion is remarkable for at least two reasons. First, the Court's approach to statutory construction could not have been more dissimilar to the method of European jurists: rather than creating whole new constructs that reshaped statutory text, the Court took a minimalist approach and strictly tied its analysis to the statutory text and certain "excluded categories" of "patentable subject matter" defined in century-old cases. Second, in its effort to develop a flexible analysis that could adapt to modern innovation, the Supreme Court adopted a methodology that anticipated the model implemented in Europe. The patentability analysis endorsed by the Court created a flexible and adaptable method for assessing whether innovations in emerging, nontraditional technologies are worthy of patent protection.

209. Id. (Stevens, J., concurring in judgment) (emphasis added) (internal citations omitted).

III. CUTTING TO THE STATUTORY BONE: THE EMERGENCE OF A TWO-STEP PATENT ANALYSIS IN THE UNITED STATES

Over the past half-century, evolving technologies have pushed the boundaries of established patent law and outpaced the legislature’s ability to respond. In this vacuum, courts were left with the difficult task of applying antiquated patentability regimes to new technologies, increasingly of a non-physical nature. In Europe, courts and administrative bodies began this struggle confronted by an underlying statute that contained a blanket exclusion of software programs. Through judicial activism and a strained statutory interpretation, jurists reshaped the plain language of the statute to the point where the “excludable category” inquiry is a mere formality. In place of excluded categories, European courts and administrative bodies substitute the flexible and formidable barriers of novelty and “inventiveness” to ensure that only patent-worthy inventions receive patent protection. Conversely, the Supreme Court has embraced judicial minimalism to pare back the Federal Circuit’s jurisprudence. In doing so, the Court cut to the statutory bone, exposing—without explicitly articulating—a broad, permissive grant of “patentable subject matter” (under § 101) and a series of restrictive requirements for patent-eligibility—novelty (§ 102), obviousness (§ 103), and sufficiency of a written description (§ 112).

These fundamentally different approaches to statutory interpretation implemented by the Boards of Appeal in Europe and the Supreme Court in the United States yield what is essentially the same flexible inquiry. The difference between the two approaches is largely cosmetic. The Boards of Appeal in Europe make a crisp distinction between (1) the analytic step of determining whether a claimed invention is comprised solely of a category of invention excluded from patent protection and (2) the separate step of determining whether the invention as a whole is sufficiently useful, novel, nonobvious, and circumscribed to be patentable. The Supreme Court cases implicitly apply the same two-step analysis; but the crisp distinction between the two steps found in European directives is often missing from the Supreme Court’s complex and challenging opinions on patentability. Examining the implicit distinction brings the Court’s underlying methodology into sharper focus.
A. The Structure and Precision of the Two-Step Analysis

As discussed in Part I, the EPC provides a statutory framework that describes a narrow, exclusionary view of software patents. As the Information Age developed it became evident that new technologies required the language of the law to adapt. In response to technological innovation, the EPO Boards of Appeal adopted a flexible interpretation of the EPC and set about reworking the standard of patentability. Whereas earlier European precedent conflated the “technical character” test inquiries of subject matter exclusion (the “technical character” step) and novelty (the “inventive step”), the current two-step analysis endorsed by the EPO clearly delineates these as separate inquiries. Further, the EPO set about narrowing the scope of the “technical character” requirement to the point that it is a formality.

This evolution culminated in the recent EBoA opinion on Referral G 03/08, in which the EBoA affirmatively acknowledged that the subject matter exclusion inquiry under Article 52 can be overcome by recitation of “technicality” alone. The minimization of subject matter as a patentability filter necessitates a robust “inventiveness” inquiry, one which is inherently flexible and culls unpatentable discoveries more precisely than an inflexible and arbitrary subject matter exclusion.

B. The Two-Step Analysis Applied in European Directives is Implicit in the Methodology Used by the United States Supreme Court in Benson, Flook, Diehr, and Bilski

At the core of all Supreme Court patentability precedent is 35 U.S.C. § 101, which provides “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefor, subject to the conditions and requirements of this title.” The Court’s various patentability opinions rest squarely on the principle that § 101 establishes a permissive grant for “process(es), machine(s), manufacture(s), or composition(s) of matter” bound only by the extra-textual excluded subject matter of laws of nature, natural phenomena, and abstract

211. See Referral G03/08, supra note 1, at 18-20.
212. See id. at 32-33.
213. See id.
214. Id.
216. Id.
ideas. The Supreme Court has cautioned that the analysis under § 101:

... turns entirely on the proper construction of § 101 of the Patent Act, which describes the subject matter that is eligible for patent protection. It does not involve the familiar issues of novelty and obviousness that routinely arise under §§ 102 and 103 when the validity of patents is challenged.

This dicta from Justice Rehnquist’s majority opinion in Diehr can be read as explicitly prohibiting the importation of §§ 102, 103, and 112 analyses when considering patent-eligibility under § 101.

The Court’s caution, however, is consistent with a two-step analysis that recognizes a sharp delineation between the first prong of the analysis (which looks at the defined categories of protection under § 101 and the common-law “subject matter” exclusions that have been a part of § 101 analysis for more than a century), and the second prong (which applies a traditional analysis under §§ 102, 103, and 112). Consistent with a minimalist statutory interpretation of § 101 and the literal meaning of the common-law exclusions, the first prong sets a low bar. Anything that fits within the four broad categories of “patentable subject matter” (processes, machines, manufactures, and compositions of matter) and does not, in its entirety, comprise one of the excluded categories (laws of nature, physical phenomena, and abstract ideas) clears the threshold step. If a claim includes elements from the excluded categories, but applies the exclusions to a broader invention, the analysis moves to the second step—a rigorous application of the traditional conditions to patentability under §§ 102, 103, and 112. The second step presents the primary barrier to patentability.

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217. Bilski v. Kappos, 130 S.Ct. 3218, 3221 (2010). ("The Court’s precedents provide three specific exceptions to § 101’s broad patent-eligibility principles: ‘laws of nature, physical phenomena, and abstract ideas.’ While these exceptions are not required by the statutory text, they are consistent with the notion that a patentable process must be ‘new and useful.’ And, in any case, these exceptions have defined the reach of the statute as a matter of statutory stare decisis going back 150 years.") (internal citations omitted).


220. In practice, the two-step analysis will be conducted in the first instance by a patent examiner in the Patent and Trademark Office (“PTO”) during patent prosecution. Indeed, in the latest interim guidance to examiners for determining subject matter eligibility following Bilski, the PTO stresses the relative importance of the traditional tests of patentability: "Examiners are reminded that § 101 is not the sole tool for determining patentability; where a claim encompasses an abstract idea, sections 102, 103, and 112 will provide additional tools for ensuring that the claim meets the conditions for patentability [as set forth by the Court in Bilski]. Therefore, examiners should avoid focusing on issues of patent-eligibility under § 101 to the detriment of considering an application for compliance with the requirements of §§ 102, 103, and 112, and should avoid treating an application solely on the basis of patent-eligibility under..."
For instance, the concern that an invention may be claimed so broadly as to wholly preempt the use of excluded subject matter is met by an application of § 112.221 If a claim is drafted so broadly as to encompass the entirety of a non-statutory element in practice, it will fail for lack of definiteness or sufficiency of a written description. Furthermore, a proper application of these traditional provisions, in keeping with KSR, should not allow unworthy inventions to slip through the cracks of the mechanistic prior art definitions of § 102. As the Supreme Court made clear, recourse to common sense is required:

Rigid preventative rules that deny recourse to common sense are neither necessary under, nor consistent with, this Court’s case law.222

The obviousness analysis cannot be confined by a formalistic conception or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. . . . Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.223

A common sense application of the novelty and nonobviousness requirements will result in the rejection or invalidation of non-

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²²¹ Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos, 75 Fed. Reg. 43922, 43922 - 43924 (Jul. 27, 2010) (though the instructions for the exclusionary test itself largely reflect considerations relevant to the “machine-or-transformation” test). District court judges may also be called upon to apply the two-step analysis when hearing motions for summary judgment. In most cases, a court will have discretion to apply the most appropriate statutory provision when considering the validity of a patent, guided by the parties’ arguments, the record before the court, and common sense. See King Pharm., Inc. v. Eon Labs, Inc., Nos. 2009-1437, 2009-1438, 2010 WL 3001333, *10 (Fed. Cir. Aug. 2, 2010) (“As an appellate court, we are not limited to a district court’s stated reasons for invalidating claims and can affirm a grant of summary judgment on any ground supported by the record and adequately raised below.”) (finding a subset of claims anticipated where the lower court rejection was based solely on § 101). Litigants are advised that they should bring claims under all available provisions to afford the court an opportunity to rule on all aspects of the invalidity defense. There may be circumstances where a validity determination under §§ 102, 103, and/or § 112 requires a finding of fact, properly for the jury, that impacts the court’s ability to rule. This is true, of course, any time a motion for summary judgment is brought to invalidate a patent. An analysis of whether questions of fact are more common when considering patentability under § 101 versus under §§ 102, 103, or 112 is beyond the scope of this article.
inventive combinations of algorithms with established manufacturing steps, or mundane business applications that modify commercial activity in trivial ways. This straightforward analysis requires nothing more than a strict application of the Patent Act and the instructions of the statute. Accordingly, as discussed below, the approach is consistent with what the Supreme Court has done for the last thirty years.

1. The Two-Step Analysis Applied in Benson

As discussed in more detail in Part II, supra, the Court in Benson considered a patent that claimed a method for a computer that converted binary-coded decimals into pure binary numbers. The Court concluded that the algorithm included in the method claim had no other practical use other than implementation in a computer and, critically, would wholly preempt the use of that algorithm in any other application.

The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm.

The Court held that a mathematical formula, without substantial practical applications except in connection with a digital computer, is not patentable. The Court reaches this commonsense result without explicitly parsing which elements of the claims fail under § 101 and which fail under other sections of the Patent Act, but such precision seems unwarranted in Benson where the patent claims "were not limited to any particular apparatus or machinery, or to any particular end use" and the patent essentially began and ended with the mathematical formula. In the Court's view, the point of novelty lived entirely in the unpatentable algorithm so the patent failed under the first step of the analysis.

In the opinion, however, the Court appears to consider requirements outside § 101 in coming to its conclusion that a machine-implemented algorithm is not patentable under § 101:

The method sought to be patented varies the ordinary arithmetic steps a human would use by changing the order of the steps,

225. Id. at 71-72.
226. Id.
227. Id.
228. Id. at 64.
changing the symbolism for writing the multiplier used in some steps, and by taking subtotals after each successive operation. The mathematical procedures can be carried out in existing computers long in use, no new machinery being necessary. And, as noted, they can also be performed without a computer.  

If the Court had determined that Benson’s claimed invention included the independent element of running the mathematical procedures on a computer, the text quoted above suggests the Court would have found the application obvious and unpatentable under § 103. Instead, the Court concluded the mathematical formula was the only inventive aspect of the claim so it looked no further than § 101.

2. The Two-Step Analysis Applied in Flook

In Flook, the patent at issue attempted to claim a method for using an algorithm to monitor a catalytic conversion process in the petrochemical industry. As the Supreme Court later explained in Diehr, Flook stands for the proposition that the prohibition on patenting abstract ideas cannot be circumvented by limiting its use to a specific technological environment or adding insignificant post-solution activity. This rule has been read as a clarification of Benson’s reasoning that method patents should not preempt the use of mathematical formula.

The majority opinion opens by presenting the question of the case: “whether the identification of a limited category of useful, though conventional, post-solution applications of such a formula makes respondent’s method eligible for patent protection.” The Court makes clear what it means by “conventional”: the invention only applies “conventional methods of changing alarm limits” to a “mathematical algorithm or formula.” The Court found that the mathematical algorithm was an objectionable “abstract idea” that, standing alone, is excluded from “patentable subject matter” by longstanding precedent. What remains is a “conventional” application of the algorithm in a method for changing alarm limits that, itself, was well-known in the prior art.

As in Benson, the Court in Flook appears to import elements of

230. See id. at 71-72.
233. Flook, 437 U.S. at 585 (emphasis added).
234. Id. at 585-86.
235. See id. at 594-95.
§ 102 and § 103 analyses into its assessment of whether the patent was patentable under § 101:

Respondent’s process is unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention. Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.236

The Court concluded that the respondent’s application contained no inventive aspect and, accordingly, was not a patentable invention. The Court recognized that “[t]he chemical processes involved in catalytic conversion of hydrocarbons are well known, as are the practice of monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for ‘automatic monitoring-alarming.’”237

The respondent charged the Court with “improperly import[ing] into § 101 the considerations of ‘inventiveness’ which are the proper concerns of §§ 102 and 103.”238 The Court responded in two ways. First, it answered that permitting patentees to establish “patentable subject matter” under § 101 merely by adding a process element to a claim that is based on an abstract idea, creates an environment where “the determination of patentable subject matter depend[s] simply on the draftsman’s art and would ill serve the principles underlying the prohibition against patents for ‘ideas’ or phenomena of nature.”239 But the Court’s concern is unwarranted. The “draftsman’s art” may be sufficient to carry an unpatentable abstraction beyond the threshold step in the two-step analysis, by adding to the claims an application, but a “conventional” application of an abstract idea will not create a patentable invention. The application must still survive the armamentarium of additional conditions to patentability under the Patent Act. Unless the application of the abstract idea in the claimed invention is useful, novel, nonobvious, and clearly circumscribed by the patent specification, the patent will not issue.

Next, the Court responded to the concern that the patent may be

236. Id. at 593-94 (emphasis added).
237. Id.
238. Id. at 592.
239. Id. at 593.
found objectionable merely because it includes an unpatentable "abstract idea" as one element of its claims. The Court responded unequivocally that the "algorithm is assumed to be within the prior art," but "[e]ven though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented." In other words, if an invention is to be patentable, the application of phenomena of nature, mathematical formula, or an abstract idea must independently be inventive and novel.

240. See id. at 593-94.
241. Id. at 594 (emphasis added). See also Gottschalk v. Benson, 409 U.S. 62, 67 (1972) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of scientific truth may be.") (quoting Mackay Co. v. Radio Corp., 306 U.S. 86, 94 (1939)); Diamond v. Diehr, 450 U.S. 175, 187 (1981) ("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.") (emphasis in original) (citations omitted).

242. In Flook, the Court suggests in dicta that Morse requires that the non-statutory subject matter and the application of that subject matter in a method should be assumed to be within the prior art for purposes of an analysis under § 101. Flook, 437 U.S. at 595 (citing O'Reilly v. Morse, 56 U.S. 62, 117, 119-20 (1853)). Morse does not support this assumption. In Morse, the Court takes the unpatentable electro-magnetic force to be well-known and then performs a standard patent-law analysis on the application of the force ("And it is the high praise of Professor Morse, that he has been able, by a new combination of known powers, of which electro-magnetism is one, to discover a method by which intelligible marks or signs may be printed at a distance. And for the method or process thus discovered, he is entitled to a patent. But he has not discovered that the electro-magnetic current, used as motive power, in any other method, and with any other combination, will do as well."). Morse, 56 U.S. at 117. The Court found the Morse claims failed for what is now described as an insufficient written description:

It is impossible to misunderstand the extent of this claim. [Morse] claims the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing intelligible characters, signs, or letters at a distance. If this claim can be maintained, it matters not by what process or machinery the result is accomplished. For aught that we now know some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff's specification.

... [Morse] says he does not confine his claim to the machinery or parts of machinery, which he specifies; but claims for himself a monopoly in its use, however developed, for the purpose of printing at a distance. New discoveries in physical science may enable him to combine it with new agents and new elements, and by that means attain the object in a manner superior to the present process and altogether different from it. And if he can secure the exclusive use by his present patent he may vary it with every new discovery and development of the science, and need place no description of the new manner, process, or machinery, upon the records of the patent office. ... [H]e claims an exclusive right to use a manner and process which he has not described and indeed had not invented, and therefore could not describe when he obtained his patent. The Court is of opinion that the claim is too broad, and not warranted by law.

Id. at 112-13 (emphasis added). It seems the Supreme Court applied a two-step analysis as early as 1853. See also Benson, 409 U.S. at 67 ("He who discovers a hitherto unknown phenomenon
In the case of the Flook patent, the Court found that “[t]he chemical processes... are well known, as are the monitoring of process variables, the use of alarms limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for ‘automatic process monitoring.’” The Court effectively drew on novelty and obviousness considerations, noting that the elements of the patent other than the mathematical algorithm were well-known in the prior art. The Court also recognized that the patent specification did not “explain how to select the appropriate margin of safety, the weighing factor, or any other of the other variables” that it might use to trigger the alarms, and thus recognized that the claimed invention also failed under the written description requirements of § 112.

Justice Stewart, in his dissenting opinion, lamented the failure of the majority opinion to make a clear separation between its analysis of “patentable subject matter” under § 101 and the assessment of other elements of patentability. Justice Stewart noted that the majority opinion:

... strikes what seems to me to be [a] damaging blow at basic principles of patent law by importing into its inquiry under 35 U.S.C. § 101 the criteria of novelty and inventiveness. Section 101 is concerned only with subject matter patentability. Whether a patent will actually issue depends upon the criteria of § 102 and § 103, which include novelty and inventiveness, among many others.

But the “basic principles of patent law” are not damaged by the majority opinion. The Court identified the elements of the claim that are unpatentable under § 101 (abstract ideas, laws of nature, physical phenomena) but also properly recognized that the application of those elements, as described by the patent, may be independently patentable. The Court then looked at the application of the unpatentable algorithm in the claimed invention and found that the application was also well-known or obvious (“conventional methods of changing alarm limits”), effectively finding that the application of the algorithm was independently unpatentable under §§ 102 and

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244. *Id.* at 586.
245. *Id.* at 600 (Stewart, J., dissenting) (emphasis in original).
246. *Id.* at 585-86.
103. The Court also recognized that the application of the algorithm described in the method failed to explain how to select key data points used in the formula, implicating a potential rejection of the patent for falling short of the written description requirement under § 112. The *Flook* patent thus cleared the first hurdle to patentability but stumbled on the second.

3. The Two-Step Analysis Applied in *Diehr*

The invention at issue in *Diehr* was a method for curing rubber that included the use of an algorithm as one component of the process. The Court distinguishes the method in *Diehr* from the unpatentable method claimed in *Flook*:

> The claims [in *Flook*] were drawn to a method for computing an "alarm limit." . . . Using [a] formula, the updated alarm limit could be calculated if several other variables were known. The application, however, did not purport to explain how these other variables were to be determined, nor did it purport "to contain any disclosure relating to the chemical processes at work, the monitoring of 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."  

Thus, in *Flook*, the scope of the claimed invention was not definite, so the claim as a whole was read as subsuming an abstract idea and claiming large swathes of the public domain. But this was not a concern to Chief Justice Rehnquist, writing for the Court in *Diehr*, who found that the claims in *Diehr* restricted the claimed invention to "an industrial process for the molding of rubber products." The scope of the claimed invention was sufficiently circumscribed by its written description so the invention was patentable.

Justice Stevens did not agree. In his dissent, Justice Stevens repeated the now-common refrain that the majority opinion ignored the critical "distinction between the subject matter of what the inventor claims to have discovered—the § 101 issue—and the question whether that claimed discovery is in fact novel—the § 102

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247. *Id.* at 586.

248. *Diamond v. Diehr*, 450 U.S. 175 (1981). In *Diehr*, the Court again emphasizes that "questions of whether a particular invention meets the 'novelty' requirements of 35 U.S.C. § 102 or the 'nonobviousness' requirements of § 103 do not affect the determination of whether the invention falls into a category of subject matter that is eligible for patent protection under § 101." *Id.* at 176, 188-89.

249. *Id.* at 186-87 (quoting *Flook*, 437 U.S. at 586).


issue." The dissenting opinion observed that the "essence of the claimed discovery" in both Flook and Diehr "was an algorithm that could be programmed on a digital computer," which was unpatentable under § 101. In other words, Justice Stevens concluded the invention "discovered" by both Diehr and Flook was the algorithm itself and the algorithm was not patentable under § 101. But, as discussed above, Chief Justice Rehnquist concluded the invention was "an industrial process for the molding of rubber products" of which the algorithm was only an element. It is not that Chief Justice Rehnquist failed to appreciate the important distinction Justice Stevens makes between discoveries that are not patentable under § 101, because the discovery itself is of an unpatentable nature, and discoveries that are not patentable because they are not new or inventive under §§ 102 and 103. Rather, the majority opinion can be read as recognizing the invention "discovered" by Diehr to be the application of the algorithm to an industrial process for the molding of rubber products, an application that was sufficiently novel, nonobvious, and limited by the specification to be patentable under §§ 102, 103, and 112, respectively. The Diehr patent cleared the first hurdle because it applied the unpatentable algorithm in a potentially patentable method for curing rubber. The patent cleared the second hurdle because the majority of the Court found the application sufficiently novel, nonobvious, and defined to warrant patent protection.

4. The Two-Step Analysis Applied in Bilski

In Bilski, the Court applied the analysis developed in Benson, Flook, and Diehr to a business method claim. Critically, the Court again emphasized the relationship between patent-eligibility under § 101 and patent-eligibility under the additional "conditions and requirements" of the Patent Act:

The § 101 patent-eligibility inquiry is only a threshold test. Even if an invention qualifies as a process, machine, manufacture, or composition of matter, in order to receive the Patent Act's protection the claimed invention must also satisfy "the conditions and requirements of this title." § 101. Those requirements include that the invention be novel, see § 102, nonobvious, see § 103, and fully and particularly described, see § 112.

252. Id. at 211 (Stevens, J., dissenting) (emphasis in original).
253. Id. at 209 (Stevens, J., dissenting).
255. Id. at 3225.
The Court implicitly acknowledges the two-step nature of the patent-eligibility analysis. First, the claimed discovery must fall into one of the categories listed in § 101. Under this step, the Court must also determine whether the invention involves the common-law categories of excludable subject matter (laws of nature, physical phenomena, and abstract ideas). Second, the discovery—typically the application of one of the excludable categories in a broader invention—must meet the additional “conditions and requirements of this title” referenced in § 101 (such as novelty, nonobviousness, and full and particular description).

Applying this analytical structure, the Court began by analyzing the “four independent categories of inventions or discoveries that are eligible for protection [under § 101]: processes, machines, manufacturers, and compositions of matter.” The Court emphasized that Congress took a permissive approach to patent eligibility to encourage innovation and these categories should be interpreted broadly. Consistent with Congress’s intent, the Court broadly interpreted the language of § 101 to include business method claims.

The Court next considered the “specific exceptions” to § 101’s broad patent-eligibility principles: laws of nature, physical phenomena, and abstract ideas. Significantly, the Court draws heavily from other “conditions and requirements of this title” in its “abstract ideas” analysis. Applying common-law exclusions to the Bilski patent, the Court found the claimed process not patentable because Bilski attempted to patent the “abstract idea” of hedging risks—“a fundamental economic practice long prevalent in our system of commerce . . . .” To the extent the claims sought to apply the “long-prevailing” principles of risk hedging to specific business methods, the Court found that the claims merely “instruct the use of well-known random analysis techniques to help establish some of the inputs of a mathematical equation” used in the process. Implicitly, the Court suggests that application of “well-known techniques” to

256. Id.
257. Id. (citing Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980)).
258. Id. at 3225.
259. Id.
260. Id.
261. Id. Notably, the Court’s analysis is also consistent with the analytical approach endorsed by the EPO.
263. Id. at 3231 (citing In re Bilski, 545 F.3d, at 1013 (Rader, J., dissenting)).
264. Id.
“long-prevalent” business practices do not satisfy the “conditions and requirements”\textsuperscript{265} of patent-eligibility defined in the Patent Act. Accordingly, the Court found the invention claimed by Bilski unpatentable.\textsuperscript{266}

Unfortunately, by wrapping its “abstract idea” dicta in a novelty analysis, the Court creates potential confusion. Justice Stevens calls out the majority on this point in his concurrence, noting that the majority opinion at various times appears to be challenging the unacceptable breadth of the claim specification (§ 112) and the claims’ novelty (§ 102) as part of the Court’s analysis of “abstract ideas” (ostensibly under § 101).\textsuperscript{267} The imprecision is unfortunate, but it need not create mischief for courts traveling in the wake of Bilski. The two steps may be analyzed separately to avoid confusion.

Applying the two-step analysis to Supreme Court precedent, we find clarity in the reticulated and challenging jurisprudence. The analysis reveals an erosion of the subject matter patentability filter. In the Court’s latest patent ruling, the Court purports to conduct a subject-matter analysis based on abstraction, but then proceeds to use a novelty and aspects of a written-description analysis as the indicators of the abstraction. The Europeans, in contrast, make a sharp distinction between low-threshold, subject matter bars and the rigorous, traditional barriers to patentability—usefulness, novelty, obviousness, and a precise delineation of scope. The Supreme Court effectively reaches this same result without the benefit of a sharp separation.

CONCLUSION

Fundamentally different approaches to statutory interpretation implemented by the European Patent Office and the United States Supreme Court yield what is essentially the same flexible inquiry. The improbable convergence suggests that the nature of the technology itself is not only driving the need for a flexible patentability inquiry but it is also defining the very nature of the inquiry. Insightful jurists may attempt to create rigid tests that accommodate technologies of the future, but it is unlikely that the shape of future technologies will fit comfortably into neat boxes. The EPO and the Supreme Court, each with the goal of recognizing novel innovation while preserving the integrity of the patent system, chose

\textsuperscript{265} 35 U.S.C. § 101.
\textsuperscript{266} Bilski, 130 S.Ct. at 3231.
\textsuperscript{267} Id. at 3235-36 (Steven, J., concurring in judgment).
to eschew rigid "subject matter" restrictions and promote a rigorous and flexible application of traditional requirements of patent-eligibility that have always served to protect only those inventions worthy of patent protection. It is not possible or necessary to determine whether all roads lead to this same result. The more interesting question may be whether this is the end of the road. Will the unknown and unknowable shape of future innovation force further refinements on what is now, in most critical respects, a common methodology for analyzing patent-eligibility?