

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

By: Frederick S. Frei¹

Abstract

No one issue in patent law, and probably no other area of law, has been as unclear and in search of understandable rules for so long a period of time as the patentability of software and business method inventions. For decades, the Patent and Trademark Office (“PTO”),² the Court of Appeals for the Federal Circuit (“CAFC”), and the Court of Customs and Patent Appeals (“CCPA”), its predecessor court, have struggled to understand and apply Supreme Court precedent from three Supreme Court cases decided between 1972 and 1981.³ *Bilski v. Kappos*,⁴ decided by the Supreme Court on June 28, 2010, adds a fourth case to the mix.

In *Bilski*, the Supreme Court determined that a method for hedging against the risk of price changes was unpatentable because it fell within the judicially created “abstract idea” exception to §101 of the Patent Act, 35 U.S.C. §101. The Court, relying on three of its prior cases, continued to refuse to lay down clear rules of patentability, refused to hold that business methods were categorically unpatentable (although the four Justice concurring opinion would have held that business methods were unpatentable), and again left it to the lower courts to apply §101 (in light of Supreme Court precedent) on a case-by-case basis. While it held that the “machine or transformation” test was not the sole test of patentability under §101, it did indicate that this test would be quite a useful tool in most of the cases. Several key questions have been left unanswered. For example, what distinguishes a patentable business method from an unpatentable one? What is an abstract idea?

Over the years, this area of law has witnessed the mental steps and method of doing business doctrines narrowed substantially and then eliminated from the calculus of §101. During the last almost 40 years, judicial treatment of the scope of §101 has ranged from the immensely broad and now rejected “technological arts” standard, to an interpretation

which stresses the exceptions to §101 coverage and sets forth a formula employing a two-step rule extracted from three cases spanning a four-year time period, followed by the extremely broad “useful, concrete and tangible result” test, followed by the “machine or transformation” test, rejected as the sole test by the *Bilski* Court. It has also included judicial interpretations of §101 that have embraced a point of novelty test and then later rejected it.

Throughout the years, two principles have remained constant: (1) laws of nature, natural phenomena, and abstract ideas are unpatentable, and (2) the application of a law of nature, formula, natural phenomena or abstract idea to an apparatus or a process may be patentable. These are the two extremes of the spectrum. The difficulties arise from classifying the invention and dealing with the myriad possibilities along the spectrum.

This article proceeds from the premise that frequently an understanding of where we are and where we are going can be assisted by an understanding of where we have been. Accordingly, this article addresses these issues in three parts. Part I addresses the *Bilski* decision. Part II traces the highlights of the tortured evolution of present day law, beginning 60 years ago with *In re Abrams* and proceeding through *State Street Bank* and the CAFC *Bilski* decisions. Part III discusses the PTO’s post-*Bilski* examination guidance and the first judicial opinion applying *Bilski*.

I. *Bilski v. Kappos*

The *Bilski* decision, while affirming the lower court holding that *Bilski*’s claims did not present patentable subject matter, overruled the CAFC *en banc* holding that the “machine or transformation test” was the exclusive test for determining whether a claim was patentable subject matter under 35 U.S.C. §101. The Supreme Court relied on 150 years of precedent, particularly three cases decided between 1972 and 1981, which had definitively established that laws

1 Frederick S. Frei practices in Washington, DC where he is a partner at Andrews Kurth LLP. He specializes in intellectual property litigation and counseling.
 2 In past decades, the PTO’s resistance to computer related inventions was based on its perceived inability to deal with the anticipated administrative burdens of examining program applications. *Diamond v. Diehr*, 450 U.S. 175, 209 U.S.P.Q. 1, 12 (1981) (dissenting opinion).
 3 See note 5. *infra*.
 4 _____ U.S. _____, 130 S. Ct. 3218 (2010).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

of nature, natural phenomena, and abstract ideas were not patentable subject matter.⁵ The CAFC's "machine or transformation" test essentially provided that a claimed process was patentable subject matter under §101 if it was tied to a particular machine or apparatus or if it transformed a particular article into a different state or thing. The Supreme Court held that this was not the sole test of patentability. Instead, the Supreme Court stated this test was a useful tool for determining patentability.⁶ In actual practice, the author is unaware of any judicial opinion that has held a claimed process to be patentable subject matter when it was not tied to a particular machine or apparatus or did not result in the transformation of a particular article into a different state or thing. The PTO recently reached the same conclusion.⁷

The claims in *Bilski* sought protection for how commodities' buyers and sellers in the energy market could protect or hedge against the risk of price changes. Claim 1 described a series of steps instructing how the risk was hedged; claim 4 put claim 1 into a simple mathematical formula. Claim 1 read as follows:

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

- (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers;
- (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.⁸

The PTO had determined that the claims were not patentable, and the CAFC had affirmed. In affirming the PTO, the *en banc* CAFC rejected its prior test under *State Street Bank & Trust Company v. Signature Financial Group, Inc.*,⁹ which had held that a process was patentable subject matter under §101 if the invention produced a "useful, concrete and tangible result."¹⁰ This test was rejected in favor of the "machine or transformation test."

The Patent Examiner rejected the claims in the *Bilski* patent application because they were not implemented on a specific apparatus, manipulated an abstract idea and solved a purely mathematical problem, and therefore were not directed to the technological arts.¹¹ The PTO Board of Patent Appeals and Interferences affirmed the Examiner's rejection, but "rejected the position that a patentable process must relate to 'technological arts' or be performed on a machine ... Instead, the Board denied petitioners' patent on two alternative, although similar, grounds: first, that the patent involves only mental steps that do not transform physical subject matter ... and, second, that it is directed to an 'abstract idea.'"¹²

Justice Kennedy delivered the opinion of the Court. Justice Stevens authored a four Justice concurring opinion. Both opinions construe the word "process" in §101 differently, and the two opinions reach materially different results with respect to the patentability of business methods.

The thrust of the Court's opinion is as follows:

Rather than adopting categorical rules that might have wide-ranging and unforeseen impacts, the Court resolves

5 130 S. Ct. at 3225. See *Diamond v. Diehr*, 450 U.S. 175, 209 U.S.P.Q. 1 (1981), *aff'd In re Diehr*, 602 F.2d 982, 203 U.S.P.Q. 44 (C.C.P.A. 1979); *Parker v. Flook*, 437 U.S. 584, 198 U.S.P.Q. 193 (1978); *Gottschalk v. Benson*, 409 U.S. 63 175 U.S.P.Q. 673 (1972).

6 *Id.* at 3227.

7 75 FR 43924 (July 27, 2010).

8 130 S. Ct. at 3223–3224.

9 149 F.3d 1368, 47 U.S.P.Q. 2d 1596 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1093 (1999).

10 149 F.3d at 1373.

11 *Id.* at 3224.

12 *Id.* at 3233.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

this case narrowly on the basis of this Court’s decisions in *Benson*, *Flook* and *Diehr* which show that Petitioners’ claims are not patentable processes because they are attempts to patent abstract ideas. Indeed, all members of the Court agree that the patent application at issue here falls outside of §101 because it claims an abstract idea.¹³

Justice Kennedy’s opinion proceeded on the basis that words in a statute are to be given their common and contemporary meaning. He noted that the terms used in §101 were expansive and of wide scope.¹⁴ Furthermore, he noted that §101 is a “dynamic provision designed to encompass new and unforeseen inventions.”¹⁵ Justice Kennedy indicated that Supreme Court precedent established only three exceptions to the four categories of patentable subject matter.¹⁶ The exceptions were: laws of nature, natural phenomena, and abstract ideas.¹⁷ The Court indicated that the “concepts covered by these exceptions are ‘part of the storehouse of knowledge of all men ... free to all men, and reserved exclusively to none.’” (Citations omitted.)¹⁸

Applying its precedent and the rules of statutory construction, the Court indicated that it was “unaware of any ‘ordinary, contemporary, common meaning ...’ of the definitional terms, ‘process, art or method’ that would require those terms to be tied to a machine or to transform an article.”¹⁹ The essence of the Court’s opinion and the reasoning employed in reaching the opinion are as follows:

Any suggestion in this Court’s case law that the Patent Act’s terms deviate from their ordinary meaning has only been an explanation for the exceptions for laws of nature, physical phenomena, and abstract ideas. See *Parker v. Flook*, 437 U.S. 584, 588–589, 98 S. Ct. 2522, 57 L. Ed. 2d 451 (1978). This Court has not indicated that the

existence of these well-established exceptions gives the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute’s purpose and design. Concerns about attempts to call any form of human activity a “process” can be met by making sure the claim meets the requirements of §101.

Adopting the machine or transformation test as the sole test for what constitutes a “process” (as opposed to just an important and useful clue) violates these statutory interpretation principles. Section 100(b) provides that “[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.” The Court is unaware of any “ordinary, contemporary, common meaning,” *Diehr, supra*, at 182, 101 S. Ct. 1048, 67 L. Ed. 2d 155, of the definitional terms “process, art or method” that would require these terms to be tied to a machine or to transform an article.²⁰

After noting that the machine or transformation test may be well suited to the industrial age, the Court indicated that, in the information age, it was reluctant to adopt a broad rule or line of demarcation that would discourage or inhibit innovation.²¹ Thus, the Court proceeded to decide the remainder of the case on very narrow grounds. Instead of holding that the term “process” in §101 excluded business methods, the Court again noted that it was unaware of any common or contemporary meaning of the statutory terms that would exclude business methods.²² Furthermore, it noted that the presence of a defense to infringement of a business method patent, 35 U.S.C. §273(b)(1), was itself an indication that a business method is in some circumstances eligible for patenting under §101.²³

13 *Id.* at 3230

14 *Id.* at 3225.

15 *Id.* at 3227.

16 *Id.* at 3225.

17 *Id.*

18 *Id.*

19 *Id.* at 3226.

20 *Id.* at 3226.

21 *Id.* at 3227–3228.

22 *Id.* at 3228

23 *Id.*

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

Despite refusing to rule that business methods were categorically not patentable, the Court suggested in several instances that business methods would not enjoy a broad patentability and that some business method patents raised special problems in terms of vagueness and “suspect validity.”²⁴ The Court cautioned that “[i]f a high enough bar is not set when considering patent applications of this sort, patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change.”²⁵ Indeed, the Court invited the CAFC to define a narrower category or class of patent applications that claimed to instruct how business should be conducted and then rule that the category was unpatentable at an abstract idea.

In affirming the Judgment of the CAFC, Justice Kennedy’s opinion summarizes its holding and succinctly sets forth its philosophy in dealing with §101 issues of patentable subject matter:

Today, the Court once again declines to impose limitations on the Patent Act that are inconsistent with the Act’s text. The patent application here can be rejected under our precedents on the unpatentability of abstract ideas. The Court, therefore, need not define further what constitutes a patentable “process,” beyond pointing to the definition of that term provided in §100(b) and looking to the guideposts in *Benson*, *Flook* and *Diehr*.

And nothing in today’s opinion should be read as endorsing interpretations of §101 that the Court of Appeals for the Federal Circuit has used in the past. *See, e.g., State Street*, 149 F.3d at 1373; *AT&T Corp.*, 172 F.3d at 1357. It may be that the Court of Appeals thought it needed to make the machine or transformation test exclusive precisely because its case law had not adequately identified less extreme means of restricting business method patents, including (but not limited to) application of our opinions in *Benson*, *Flook* and *Diehr*. In disapproving an exclusive machine or transformation test, we by no means foreclose

the Federal Circuit’s development of other limiting criteria that further the purposes of the Patent Act and are not inconsistent with its text.

Justice Stevens’ concurring opinion reflects a wholly different approach to the issues than that reflected in Justice Kennedy’s opinion. Justice Stevens was very much influenced by the history of the Patent Act and the fact that words in the Patent Act had their own particular meanings which would oftentimes be different than the common or contemporary meaning. Applying that principle, Justice Stevens and three other Justices would have held that business methods are not patentable subject matter under §101 because they are not a “process” under that section. It is clear that Justice Stevens was not satisfied with deciding the case on the narrow grounds that the claimed subject matter was an unpatentable abstract idea. Indeed, Justice Stevens stated:

“The Court, in sum, never provides a satisfying account of what constitutes an unpatentable abstract idea. Indeed, the Court does not even explain if it is using the machine or transformation criteria. The Court essentially asserts its conclusion that petitioners’ application claims an abstract idea. This mode of analysis (or lack thereof) may have lead to the correct outcome in this case, but it also means that the Court’s musings on this issue stand for very little.”²⁶

Justice Stevens indicated that Supreme Court precedent made it clear that the term “process” does not refer to a “process” in the ordinary sense of the word.²⁷ He was of the view that the history of U.S. Patent Law strongly supported the conclusion that a method of doing business was not patentable subject matter.²⁸ In reaching that conclusion, Justice Stevens reviewed English Law, Early American Patent Law and Modern American Patent Law and concluded that Courts had consistently construed the constitutional term “arts” to exclude methods of doing business. Justice Stevens believed that when Congress changed the language in §101 it incorporated

²⁴ *Id.* at 3229.

²⁵ *Id.*

²⁶ *Id.* at 3237.

²⁷ *Id.* at 3239.

²⁸ *Id.* at 3239.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

the prevailing judicial terminology and codified the prevailing judicial interpretation into the 1952 Patent Act. Indeed, Justice Stevens characterized this lengthy history as “strong historical evidence that a method of doing business does not constitute a “process” patentable subject matter under §101.”²⁹

Justice Stevens rejected the argument that §273 indicated that Congress understood that business methods were patentable. First, he indicated that a later statute had very little, if any significance to interpreting a statute passed by another Congress years before. Second, Justice Stevens believed that §273 did not show that the later Congress understood that §101 covered business methods.³⁰ Thus, Justice Stevens believed that §273 “may have been a technically unnecessary response to confusion about patentable subject matter, but it appeared necessary in 1999 in light of what was being discussed in legal circles at the time.”³¹ It did not indicate that Congress was satisfied with the CAFC’s *State Street Bank* decision.

Thus, while Justice Kennedy’s opinion decided the case on basis of the three exceptions to §101 patentability and held that the claims were directed to abstract ideas, Justice Stevens’ opinion would have held that business methods were historically unpatentable under the Patent Laws of the United States, and there was no evidence that Congress understood anything to the contrary and did not incorporate the historical understanding into the 1952 Patent Act. Thus, rather than deal with the vague concept of whether something was an abstract idea, Justice Stevens would have promulgated a bright line of demarcation and held that business method patents fell on the wrong side of that line.

In conclusion, Justice Kennedy’s opinion held that business methods were not *per se* unpatentable. That opinion reflects

the Court’s continued reluctance to set forth a rule containing a bright line of demarcation as to what is patentable subject matter and what is not patentable subject matter because such a test for patentability could have the unforeseen effect of inhibiting innovation in the information technology age. Instead, it reaffirmed its earlier broad test, again held that abstract ideas were not patentable, and again left it to lower courts to construe §101 in individual cases involving specific claims. Nevertheless, it did suggest that claims that instruct how to conduct business could be a narrow category of unpatentable subject matter.

II. Sixty Years—From Abrams to Bilski with Intermediate Rule Changes and Stops at the Supreme Court

It had long been settled that scientific principles or their mathematical expressions, laws of nature, mathematical formulas, physical phenomena and abstract ideas, were not patentable categories of subject matter.³² While formulas or principles *per se* are not patentable,³³ their application to, for example, an apparatus or a process may be patentable. Thus, in *Mackay Radio, supra*, a directional antenna system was held to be patentable even though the invention defined the angular relationship between a pair of conductors in terms of a mathematical formula expressing that relationship as a function of wire length and frequency. In *Eibel Process, supra*, the patentee applied the law of gravity to papermaking apparatus to enhance the flow of product.

With this historical perspective and these black letter principles as a backdrop, it is necessary to address *In re Abrams*³⁴ and *In re Shao Wen Yuan*³⁵, prior to reviewing the mainstream of cases involving software-related inventions

29 *Id.* at 3250.

30 *Id.*

31 *Id.* at 3251–3252.

32 *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 76 U.S.P.Q. 280 (1948); *Mackay Radio & Tel. Co. v. Radio Corp. of America*, 306 U.S. 86, 40 U.S.P.Q. 199. (1939); *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45 (1923); *O’Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854); *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall) 498 (1874); *Le Roy v. Tatham*, 55 U.S. (14 How.) 156 (1853).

33 In *O’Reilly, supra*, Morse patented his process for using electromagnetism to print symbols. Yet, the Supreme Court denied one claim which sought to patent the idea of using “electromagnetism, however developed, for making or printing intelligible” symbols. That holding was subsequently explained by the Supreme Court as prohibiting a patent for “the use of magnetism as a motive power, without regard to [a] particular process.” *Telephone Cases*, 126 U.S. 1, 534 (1888).

34 188 F.2d 165, 89 U.S.P.Q. 266 (C.C.P.A. 1951).

35 188 F.2d 377, 89 U.S.P.Q. 324 (C.C.P.A. 1951).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

prior to the inception of the CAFC in 1982. *Abrams* dealt with a method for prospecting for natural gas and petroleum deposits and included certain calculation and comparison steps. The specification did not disclose any analog device for carrying out these steps and, as of the 1944 filing date, general-purpose digital computers were futuristic devices. The CCPA held that the claims were unpatentable because their point of novelty resided in purely mental steps.³⁶

In *Yuan*, the CCPA applied the same rule to two claims involving airfoils, an article claim and a claim for the process of making the article. The invention dealt with application of a mathematical formula to determine the optimum airfoil profile. As in *Abrams*, the CCPA observed that the invention required the use of purely mental steps and therefore was unpatentable.³⁷

A. The Early Cases and *Benson*

As technology moved into the computer age, the CCPA was required to address the mental steps doctrine in the context of computers. *In re Prater*³⁸ is generally considered to be the first “computer case”—a case which began a still evolving period of unsettled law. *Prater* dealt with a method and apparatus for spectrographic analysis. The invention used a set of equations generating the least error application. Unlike *Abrams* and *Yuan*, the specification disclosed a special purpose analog device and stated that general-purpose digital computers could also be used although no program was disclosed. Nevertheless, the process claims were held to be unpatentable because—even when construed in light

of the specification—they were broad enough to cover purely mental steps. The holding, however, was based on 35 U.S.C. §112 because the claims read on subject matter (*i.e.*, mental steps) which the appellants did not regard as their invention. If the claims were limited to a machine-implemented process, the result would have been different.³⁹ Because the means-plus-function language in the apparatus claim did not, as a matter of law, encompass humans, that claim was allowed.

Over the next several years and in a number of decisions, the CCPA continued to interpret §101 in the context of software-related inventions. With each case, the scope of §101 was expanded. Thus, in *In re Mahony*,⁴⁰ the CCPA gave short shrift to a §101 rejection of a method for operating on bits in electrical signal form, including the three steps of comparing, registering and counting. As the court noted, the invention was “clearly a contribution to the automatic data processing art”⁴¹ and the claims did not read on mental steps.⁴² That same year, the CCPA stated that all that was necessary to make a process statutory was that it be in “the technological arts so as to be in consonance with the Constitutional purpose to promote the process of ‘useful arts’.”⁴³ One judge observed that the effect of the holding was to leave “little remain[ing]” in the mental steps doctrine.⁴⁴ The technological arts test was again applied in *In re Foster*.⁴⁵ These cases reached their watershed in *In re Benson*,⁴⁶ where the CCPA upheld the patentability of a method of converting binary-coded decimal form signals into pure binary form. Like *Mahony*, *Benson* dealt with data-processing itself and thus, was in the technological or useful arts.⁴⁷

³⁶ *Id.*

³⁷ In *Yuan*, the rule was stated as follows:

This court has deemed it to have been thoroughly established by decisions of various courts that purely mental steps do not form a process which falls within the scope of patentability as defined by statute.

89 U.S.P.Q. at 327.

³⁸ 415 F.2d 1393, 162 U.S.P.Q. 541 (C.C.P.A. 1969).

³⁹ In *In re Bernhart*, 417 F.2d 1395, 163 U.S.P.Q. 611 (C.C.P.A. 1969), process claims directed to a computerized plotting method complied with Sections 101 and 112 because the claims when read in light of the specification required the process to be machine-implemented. The claims were, however, unpatentable over the prior art. The apparatus claims were patentable. In the course of its decision, the CCPA rejected the point of novelty test as the rule for determining whether an invention fits within a statutory class. 163 U.S.P.Q. at 615-16.

⁴⁰ 421 F.2d 742, 164 U.S.P.Q. 572 (C.C.P.A. 1970).

⁴¹ *Id.* at 575.

⁴² *Id.* at 576.

⁴³ *In re Musgrave*, 431 F.2d 882, 167 U.S.P.Q. 280, 289-90 (C.C.P.A. 1970) (method of establishing more precise seismograms).

⁴⁴ *Id.* at 291.

⁴⁵ 438 F.2d 1011, 169 U.S.P.Q. 99 (C.C.P.A. 1971) (method and apparatus for removing distortion from seismograms).

⁴⁶ 441 F.2d 682, 169 U.S.P.Q. 548 (C.C.P.A. 1971), *rev'd sub nom. Gottschalk v. Benson*, 409 U.S. 63, 175 U.S.P.Q. 673 (1972). See also *In re McIlroy*, 442 F.2d 1397, 170 U.S.P.Q. 31 (C.C.P.A. 1971) (method for processing information is statutory because it is in the technological or useful arts).

⁴⁷ 169 U.S.P.Q. at 553.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

The CCPA's technological arts interpretation of §101, was dealt a severe blow by the Supreme Court when it reversed *Benson*. In *Gottschalk v. Benson*,⁴⁸ a unanimous Court (three Justices took no part in consideration of the case), without citation to any CCPA precedent, reaffirmed over a century of its earlier holdings. The Court stressed that ideas, scientific truths, mathematical expressions and phenomena of nature were not patentable; if the foregoing were to be the basis of patentable invention, such inventions would come from their application.⁴⁹

According to the Court, the claims in *Benson* were "abstract and sweeping," covering known and unknown uses of the process and were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.⁵⁰ The process could be performed on any existing machinery, future developed machinery, or without any machinery.⁵¹ The Court held that the claimed invention was not patentable because the mathematical formula had no substantial application outside the context of a digital computer and the "patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself."⁵²

B. The Difficulties in Applying *Benson*

Over the next six years, in more than ten cases, the CCPA struggled with the Supreme Court's holding in *Benson*. Many of these decisions involved multi-judge dissents or separate concurring opinions. All of the decisions reflected efforts to construe *Benson* and develop workable rules for vastly different fact patterns.

For example, in *In re Christensen*,⁵³ the CCPA held that a claimed method for determining the porosity of a subsurface formation in situ was non-statutory. The steps involved forming a fluid-filled hole, measuring density, generating waves, computing wave velocities, determining the bulk modulus of the fluid and computing the porosity of the formation from the variables in the claim pursuant to a complex formula. The CCPA resurrected the point of novelty test and described the issue as whether a method claim was statutory where "the point of novelty is a mathematical equation to be solved as the final step of the method."⁵⁴ Without discussing the rationale or correctness of its prior decisions beginning with *Abrams*, *supra*, the CCPA held:

48 409 U.S. 63, 175 U.S.P.Q. 673 (1972).

49 175 U.S.P.Q. at 675.

50 *Id.* at 674-75. Claims 8 and 13 were illustrative:

8. The method of converting signals from binary coded decimal form into binary which comprises the steps of—
 - (1) storing the binary coded decimal signals in a reentrant shift register,
 - (2) shifting the signals to the right by at least three places, until there is a binary 1 in the second position of said register,
 - (3) masking out said binary 1 in said second position of said register,
 - (4) adding a binary 1 to the first position of said register,
 - (5) shifting the signals to the left by two positions,
 - (6) adding a 1 to said first position, and
 - (7) shifting the signals to the right by at least three positions in preparation for a succeeding binary "1" in the second position of said register.
13. A data processing method for converting binary coded decimal number representations into binary number representations comprising the steps of—
 - (1) testing each binary digit position *i*, beginning with the least significant binary digit position, of the most significant decimal digit representation for a binary 0 or a 1;
 - (2) if a binary 0 is detected, repeating step (1) for the next least significant binary digit position of said most significant decimal digit representation;
 - (3) if a binary 1 is detected, adding a binary 1 at the (i+1)th and (i+3)th least significant binary digit positions of the next lesser significant decimal digit representation, and repeating step (1) for the next least significant binary digit position of said most significant decimal digit representation;
 - (4) upon exhausting the binary digit positions of said most significant decimal digit representation, repeating steps (1) through (3) for the next lesser significant decimal digit representation as *modified* by the previous execution of steps (1) through (3); and
 - (5) repeating steps (1) through (4) until the second least significant decimal digit representation has been so processed.

Id. at 677.

51 *Id.* at 675.

52 *Id.* at 676.

53 478 F.2d 1392, 178 U.S.P.Q. 35 (C.C.P.A. 1973).

54 17 U.S.P.Q. at 37.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

Given that the method of solving a mathematical equation may not be the subject of patent protection, it follows that the addition of the old and necessary antecedent steps of establishing values for the variables in the equation cannot convert the unpatentable method to patentable subject matter.⁵⁵

In *In re Johnston*,⁵⁶ the CCPA upheld the patentability of certain apparatus claims and again limited the *Benson* holding to process claims.⁵⁷ In that case the claims were directed to apparatus that was an automatic financial record-keeping system employing a digital computer. Judge Rich dissented, contending that the invention was really a computer program and, thus, was unpatentable under *Benson*, irrespective of whether the claims were presented in apparatus or process form.⁵⁸

In *In re Noll*,⁵⁹ the CCPA, taking its cue from the Supreme Court,⁶⁰ expressly limited *Benson* to “method claims such as those presented in that case.”⁶¹ Accordingly, it held that apparatus claims directed to a computer graphics system were statutory. In so holding, the CCPA rejected the point of novelty test and stressed that unlike *Benson*, the claimed invention was drawn to a physical structure, was limited to a particular technology and did not include all machines capable of giving the desired results.⁶² Judges Lane and Rich dissented on the ground that the effect of the *Benson*

holding precluded a patent on a computer program, an issue which the majority did not decide.⁶³

In *In re Chatfield*,⁶⁴ the CCPA upheld the patentability of process claims, based on its narrow view of *Benson*’s holding. In *Chatfield* the claims were directed to a method of operating a computing system by making it more efficient in executing a plurality of processing programs.⁶⁵ The process adjusted the priorities of computer processing programs, but no program by itself was claimed. In holding that the claims presented statutory subject matter, the CCPA adhered to its rejection of the point of novelty test and found that the independent claims did not contain a formula or algorithm, that the claimed invention did not preempt a formula or algorithm, that the last step of the method did not end with solution of an equation and that the claimed invention was limited to a particular use.⁶⁶ Judges Rich and Lane again dissented on the ground that *Benson* precluded a patent on a program for a general purpose digital computer.⁶⁷

In *In re Flook*,⁶⁸ the CCPA upheld the patentability of a method for updating the value of alarm limits in a catalytic, hydrocarbon conversion processes.⁶⁹ The CCPA distinguished the invention from *Benson* on the ground that the invention used an algorithm to modify a conventional manufacturing process and, thus, materially limited the scope of the claim to

55 *Id.* at 37–38.

56 502 F.2d 765, 183 U.S.P.Q. 172 (C.C.P.A. 1974), *rev’d sub nom. on other grounds, Dann v. Johnston*, 425 U.S. 219, 189 U.S.P.Q. 257 (1976).

57 *Id.* at 172; see also 178 U.S.P.Q. at 37.

58 *Id.* at 179.

59 545 F.2d 141, 191 U.S.P.Q. 721 (C.C.P.A. 1976), *cert. denied*, 434 U.S. 875, 195 U.S.P.Q. 465 (1977).

60 *Dann v. Johnson*, 425 U.S. 219, 224, 189 U.S.P.Q. 257, 259 (1976).

61 191 U.S.P.Q. at 727.

62 *Id.* at 725-26.

63 *Id.* at 727.

64 545 F.2d 152, 191 U.S.P.Q. 730 (C.C.P.A. 1976), *cert. denied*, 434 U.S. 875, 195 U.S.P.Q. 465 (1977).

65 191 U.S.P.Q. at 733.

66 *Id.* at 736-37.

67 *Id.* at 738.

68 559 F.2d 21, 195 U.S.P.Q. 9 (C.C.P.A. 1977), *rev’d sub nom. Parker v. Flook*, 437 U.S. 584, 198 U.S.P.Q. 193 (1978).

69 Claim 1 was illustrative:

A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons wherein said alarm limit has a current value of $Bo + K$

wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises:

(1) determining the present value of said process variable, said present value being defined as PVL;

(2) determining a new alarm base, $B1$, using the following equation: $B1 = Bo (1.0-F) + PVL(F)$ where F is a predetermined number greater than zero and less than 1.0;

(3) determining an updated alarm limit value which is defined as $B1 + K$; and, thereafter

(4) adjusting said alarm limit to said updated alarm limit value.

195 U.S.P.Q. at 10.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

less than the mere solving of an algorithm. Because solution of the algorithm would not infringe the claims, *Benson* was stated to be inapplicable.⁷⁰

The post-*Benson* phase of CCPA precedent essentially ended with *In re Freeman*,⁷¹ where the CCPA held that apparatus and method claims directed to computer typesetting were statutory because they did not recite an algorithm. The court set forth a two-step test:

Determination of whether a claim preempts non-statutory subject matter as a whole, in the light of *Benson*, requires a two-step analysis. First, it must be determined whether the claim directly or indirectly recites an “algorithm” in the *Benson* sense of that term, for a claim which fails even to recite an algorithm clearly cannot wholly preempt an algorithm. Second, the claim must be further analyzed to ascertain whether in its entirety it wholly preempts that algorithm.⁷²

C. Flook and Its Application

The post-*Benson* stage of case law development led to the Supreme Court’s 6–3 reversal of *Flook* in *Parker v. Flook*.⁷³ In that case, the Supreme Court answered the question which had been left open in *Benson*. The only novel feature of the process was a mathematical formula. The issue was whether a process using a novel mathematical formula could be patented if there had been an “identification of a limited category of useful, though conventional, post-solution applications of such a formula ...”⁷⁴ The invention essentially contained three steps: (1) determining the present value of a process variable; (2)

calculating an updated alarm limit; and (3) adjusting the alarm limit to the updated value.⁷⁵ Although there were numerous processes to which the invention could be applied, the claimed invention did not cover every such application.

The Supreme Court reversed the CCPA and stated that the issue was to be resolved as though the formula presented by the claim was part of the prior art.⁷⁶ Thus, the inquiry was whether there has been an inventive application of the formula. As the Court stated:

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 the application.⁷⁷

In *Parker v. Flook*, the chemical processes, the monitoring of process variables, and the use, recomputation and readjustment of alarm limits were well known. The invention was unpatentable because it only provided “a new and presumably better method for calculating alarm limit values.”⁷⁸

Over the course of the next three years, the CCPA applied the Supreme Court’s holdings in *Benson* and *Flook* in at least nine cases. In four cases, the inventions were held to be non-statutory. For example, in *In re Sarkar*,⁷⁹ a non-statutory

70 See also *In re Deutsch*, 553 F.2d 689, 193 U.S.P.Q. 645 (C.C.P.A. 1977) (statutory method for controlling and optimizing the operation of a system of multi-unit plants using the results of an algorithm). Compare, *In re Waldbaum*, 559 F.2d 611, 194 U.S.P.Q. 465 (C.C.P.A. 1977) (non-statutory claims to a method of calculating in data processor’s in general and in a telephone switching system would preempt an algorithm); *In Application of re Richman*, 563 F.2d 1026, 195 U.S.P.Q. 340 (C.C.P.A. 1977) (non-statutory method of calculating a correction factor); *In re de Castelet*, 562 F.2d 1236, 195 U.S.P.Q. 439 (C.C.P.A. 1977) (non-statutory method for generating a curve or family of curves, employing a computer in conjunction with drafting and milling machines).

71 573 F.2d 1237, 197 U.S.P.Q. 464 (C.C.P.A. 1978).

72 197 U.S.P.Q. at 471. See also *In re Toma*, 575 F.2d 872, 197 U.S.P.Q. 852 (C.C.P.A. 1978) (statutory method of operating a digital computer to translate languages, e.g., Russian into English, did not recite an algorithm; the method of enabling a computer to translate is in the technological arts).

73 437 U.S. 584, 198 U.S.P.Q. 193 (1978).

74 198 U.S.P.Q. 195.

75 *Id.*

76 *Id.* at 199–200.

77 *Id.* at 199.

78 *Id.*

79 588 F.2d 1330, 200 U.S.P.Q. 132 (C.C.P.A. 1978).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

method for mathematically modeling an open channel was described by the CCPA as a mathematical exercise involving a novel formula, the assembly of formula dictated values and the solution to the formula. The CCPA stressed that a process was within §101 unless it fell “within a judicially determined category of nonstatutory subject matter exceptions.”⁸⁰

In *In re Application of Gelnovatch*,⁸¹ the court, held non-statutory, a method of automatically determining, from a set of initial reference parameters, a set of optimal microwave circuit element parameters. Similarly, in *In re Application of Maucorps*,⁸² the court held non-statutory, apparatus for determining an optimum model of a sales organization because it comprised each and every means for carrying out a solution technique for a set of equations, and, thus, wholly preempted the claimed algorithms.⁸³

In *In re Application of Walter*,⁸⁴ the CCPA held that method and “means for” apparatus claims directed to seismic surveying were unpatentable because they were directed to correlating or cross-correlating and interpreting the results of seismic surveying. In that case, the calculations were the beginning and end of the claim, which had no substance apart from the calculations. To reflect the Supreme Court’s holding in *Parker v. Flook*, the CCPA restated the second step of its *Freeman* analysis:

The second step of the *Freeman* test is stated in terms of preemption. We note, however, that *Flook* does not require literal preemption of a mathematical algorithm found in a patent claim. The Court there stated that *Flook*’s claims did not “cover every conceivable application of the formula” ... Since we have noted that *Flook* does not require literal preemption of a mathematical algorithm by a claim for a

finding that the claim is non-statutory, we thus deem it appropriate to restate the second step of the *Freeman* test in terms other than preemption. Once a mathematical algorithm has been found, the claim *as a whole* must be further analyzed. If it appears that the mathematical algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in apparatus claims) or to refine or limit claim steps (in process claims), the claim being otherwise statutory, the claim passes muster under §101. If, however, the mathematical algorithm is merely presented and solved by the claimed invention, as was the case in *Benson* and *Flook*, and is not applied in any manner to physical elements or process steps, no amount of post-solution activity will render the claim statutory; nor is it saved by a preamble merely reciting the field of use of the mathematical algorithms.

Various indicia are helpful in determining whether a claim as a whole calls merely for the solution of a mathematical algorithm. For instance, if the end-product of a claimed invention is a *pure number*, as in *Benson* and *Flook*, the invention is non-statutory regardless of any post-solution activity which makes it available for use by a person or machine for other purposes. If, however, the claimed invention produces a physical thing, such as the noiseless seismic trace in *In re Johnson, supra*,⁸⁵ the fact that it is represented in numerical form does not render the claim nonstatutory.⁸⁶

D. *Diehr* and Its Progeny

Having ruled in *Benson* and *Flook* that an algorithm and its solution were not patentable, the Supreme Court affirmed the

⁸⁰ 200 U.S.P.Q. at 137.

⁸¹ 595 F.2d 32, 201 U.S.P.Q. 136 (C.C.P.A. 1979).

⁸² 609 F.2d 481, 203 U.S.P.Q. 812 (C.C.P.A. 1979).

⁸³ Compare *In re Application of Bradley*, 600 F.2d 807, 202 U.S.P.Q. 480 (C.C.P.A. 1979), *aff’d by an equally divided Court sub nom. Diamond v. Bradley*, 450 U.S. 381, 209 U.S.P.Q. 97 (1981) (statutory apparatus claim designed to enhance internal operation of a computer did not recite an algorithm and did not solve an equation); *In re Application of Phillips*, 608 F.2d 879, 203 U.S.P.Q. 971 (C.C.P.A. 1979) (statutory apparatus and method claims to prepare printed architectural specifications did not recite an algorithm).

⁸⁴ 618 F.2d 758, 205 U.S.P.Q. 397 (C.C.P.A. 1980).

⁸⁵ In *In re Johnson*, 589 F.2d 1070, 200 U.S.P.Q. 199 (C.C.P.A. 1978), referred to in *Walter*, the CCPA held that a method for removing undesired noise components from seismic data was statutory. The result of the process was a noiseless seismic trace recorded on a record medium, as opposed to mere mathematical values. See also *In re Application of Sherwood*, 613 F.2d 809, 204 U.S.P.Q. 537 (C.C.P.A. 1980), *cert. denied*, 450 U.S. 994 (1981) (statutory method and means for converting amplitude-versus-time seismic traces to amplitude-versus-depth traces).

⁸⁶ 205 U.S.P.Q. at 407 (emphasis in original; footnotes and citations omitted).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

CCPA in *Diamond v. Diehr*,⁸⁷ a case involving the application of a prior art algorithm to a process for curing rubber. The invention involved the use of a programmed digital computer and the continued monitoring of the actual temperature inside a mold for curing rubber. The temperature measurements were fed into the computer, the cure time was continuously calculated by use of the well-known Arrhenius equation and the press was opened when the elapsed time equaled the cure time.⁸⁸ The respondents contended that the continuous measuring of the temperature in the mold, the feeding of this information to a digital computer which continually calculated the cure time and the computer controlled opening of the press were novel.⁸⁹

The Supreme Court opinion was a bare 5–4 majority and contained a vigorous dissent which strongly criticized CCPA precedent. The majority held that the claims were statutory:

[T]he respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to preempt the use of that equation. Rather, they seek only

to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process. These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time. Obviously, one does not need a “computer” to cure natural or synthetic rubber, but if the computer use incorporated in the process patent significantly lessens the possibility of “overcuring” or “undercuring,” the process as a whole does not thereby become unpatentable subject matter.⁹⁰

Parker v. Flook was distinguished on the grounds that it simply sought protection for a formula for computing a number⁹¹ and did not explain how process variables were determined or disclose the chemical processes at work, the monitoring of process variables or the means of setting off an alarm system.⁹²

Subsequent to *Diamond v. Diehr*, *supra*, there have been a number of cases which have construed §101 in the context of computer-related inventions. In *In re Taner*,⁹³ the CCPA upheld an invention related to seismic exploration. An

87 450 U.S. 175, 209 U.S.P.Q. 1 (1981) *aff'g In re Diehr*, 602 F.2d 982, 203 U.S.P.Q. 44 (C.C.P.A. 1979).

88 Claim 1 was illustrative:

A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising: providing said computer with a data base for said a press including at least, natural logarithm conversion data (ln), the activation energy constant (C) unique to each patch of said compound being molded, and a constant (x) dependent upon the geometry of the particular mold of the press, initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure, constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding, constantly providing the computer with the temperature (Z), repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is $\ln v = CZ + x$ where v is the total required cure time, repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and opening the press automatically when a said comparison indicates equivalence.

209 U.S.P.Q. at 5 n.5.

89 *Id.* at 5.

90 *Id.* at 8.

91 The Court of Claims used the same reasoning to hold that claims for a directional computer were non-statutory. In *Arshal v. United States*, 621 F.2d 421, 208 U.S.P.Q. 397 (Ct. Cl. 1980), *cert. denied*, 449 U.S. 1077 (1981), the claims cited three elements: (1) as physically defined, stabilized reference frame; (2) means of obtaining input signals; and (3) means to calculate. The first and second elements were essential to perform the calculations made by the third element. Moreover, the invention was disclosed in a report using only mathematical equations, without the disclosure of any apparatus. The court held that the purpose of the invention was to compute a new value and that the claim pre-empted the equation. 208 U.S.P.Q. at 407-08.

92 209 U.S.P.Q. at 8.

93 681 F.2d 787, 214 U.S.P.Q. 678 (C.C.P.A. 1982).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

illustrative claim⁹⁴ had three steps to it. In the first step, spherical seismic energy waves were imparted into the earth from a seismic source. In the second step, a plurality of reflection signals were generated in response to the seismic energy waves. In the third step, the reflection signals were summed to simulate or convert the reflection response of the earth to seismic energy.

The PTO had concluded that the claims merely presented and solved an algorithm, *i.e.*, the summing step, and thus, preempted an algorithm. The fact that the claims were limited to geophysical exploration and that the algorithm was not literally preempted was not viewed by the PTO to be sufficient to save the claims.⁹⁵

The CCPA disagreed with the conclusion that the claims merely presented and solved an algorithm. The Court said that while the claims did directly recite an algorithm, *i.e.*, the summing, the appellants were not seeking to patent the algorithm in the abstract. Rather, the claims were drawn to a technique of seismic exploration which simulates the response of subsurface earth formations to cylindrical or plain waves.⁹⁶ The CCPA viewed the claim as taking substantially spherical seismic signals obtained from conventional exploration and converting them (simulating the signals into another form) to a form representing the earth's response

to cylindrical or plain waves. Accordingly, the claims were statutory within the meaning of §101.⁹⁷

Additionally, the Court overruled its *Christensen*, *supra* decision to the extent of any conflict, *i.e.*, that the point of novelty test was made inapplicable by the Supreme Court's decision in *Diamond v Diehr*.⁹⁸

In *In re Abele*⁹⁹ the CCPA interpreted the *Freeman/Walter* test and pointed out that it was not meant to be the exclusive or comprehensive test. In that case, the CCPA affirmed the rejection of some claims as drawn to non-statutory subject matter and reversed with respect to many other claims.

In clarifying the *Freeman/Walter* test, the CCPA said that *Walter* should be read as:

requiring no more than the algorithm be "applied in any manner to physical elements or process steps," provided that its application is circumscribed by more than a field of use limitation or non-essential post-solution activity. Thus, if the claim would be "otherwise statutory" ... albeit inoperative or less useful without the algorithm, the claim likewise presents statutory subject matter when the algorithm is included. This broad reading of *Walter*, we conclude, is in accord with the Supreme Court decisions.¹⁰⁰

94 Claims 1 and 24, the only independent claims, are illustrative:

1. A method of seismic exploration by simulating from substantially spherical seismic waves the reflection response of the earth to seismic energy having a substantially continuous wavefront over an extent of an area being explored having at least one dimension which is large relative to a seismic wavelength, comprising the steps of:
 - (a) imparting the spherical seismic energy waves into the earth from a seismic source at a source position;
 - (b) generating a plurality of reflection signals in response to the seismic energy waves at a set of receiver positions spaced in an array over an extent having at least one dimension which is large relative to seismic wavelength; and
 - (c) summing the reflection signals to form for the source position a signal simulating the reflection response of the earth to seismic energy having a substantially continuous wavefront over at least one dimension which is large relative to a seismic energy wavelength.
24. A method of seismic exploration by simulating from substantially spherical seismic waves the reflection response of the earth to seismic energy having a substantially continuous wavefront over an extent of an area being explored having at least one dimension which is large relative to a seismic wavelength, comprising the steps of:
 - (a) imparting the spherical seismic energy waves into the earth from a set of seismic sources at source positions spaced in an array over an extent having at least one dimension which is large relative to a seismic wave length;
 - (b) generating a reflection signal at a receiver position in response to each of the seismic energy waves; and
 - (c) summing the reflection signals to form for the receiver position a signal simulating the reflection response of the earth to seismic energy having a substantially continuous wavefront over at least one dimension which is large relative to a seismic energy wave length.

214 U.S.P.Q. at 679.

95 *Id.* at 679–681.

96 *Id.* at 681.

97 *Id.*

98 *Id.* at 682.

99 684 F.2d 902, 214 U.S.P.Q. 682 (C.C.P.A. 1982).

100 *Id.* at 686.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

The invention in *Abele* was directed to an improvement in CAT scans. Essentially, two types of claims were involved. One type was held to be non-statutory subject matter; the other type was held to be statutory. The non-statutory claim claimed a method of displaying data and comprised essentially two steps: the first was calculating the difference between data; the second was displaying the value of the difference.¹⁰¹ The claims that were held to be statutory subject matter defined the nature of the data.¹⁰²

The CCPA held that the claim presenting statutory subject matter differed from the non-statutory claim because it required x-ray attenuation data.¹⁰³ The Court noted that the patent specification indicated that such attenuation data was available only when an x-ray beam was produced by a CAT scanner, passed through an object, and detected upon its exit. Only after those steps were completed was the algorithm performed and the data displayed in the format required by the claim.¹⁰⁴

The court viewed the production, detection and display steps as statutory subject matter. Accordingly, the court held that the claim defined the variables and placed the algorithm in a particular relationship to a series of steps in a particular type of process permitting the algorithm to be applied as a further process step.¹⁰⁵

The *Freeman/Walter/Abele* holdings were cited in *In re Pardo*,¹⁰⁶ where the CCPA again reversed the PTO and upheld

the patentability of claims dealing with a method of controlling the internal operations of a computer and apparatus so controlled. The invention converted a computer from a sequential processor which executed program instructions in the order in which they were presented to a processor which was not dependent on the order in which program steps were received. This capability is important when the execution of certain program steps depends upon the results of other program steps. The method claims included examining, compiling, storing and executing program steps.¹⁰⁷

The PTO had concluded that the method claims were directed in their entirety to an algorithm and that the algorithm simply rearranged the order of steps or formulas as presented by the user, so that the computer could execute the operation.¹⁰⁸

To the contrary, the CCPA said that it was unable to find any formula, calculation or algorithm either directly or indirectly in the claimed method. Since the claims did not fall within any exception to Section 101, they presented patentable subject matter.¹⁰⁹

In *In re Meyer*,¹¹⁰ one of the last CCPA cases—the CCPA affirmed the PTO's rejection by applying the *Freeman/Walter/Abele* test. In that case, the invention dealt with a process and apparatus to assist a doctor in diagnosing a patient by identifying locations of probable malfunction.¹¹¹

In broad terms, the invention was a diagnostic or memory aid for physicians. Essentially, information was accumulated from

101 Claim 5 read as follows: A method of displaying data in a field comprising the steps of calculating the difference between the local value of the data at a data point in the field and the average value of the data in a region of the field which surrounds said point for each point in said field, and displaying the value of said difference as a signed gray scale at a point in a picture which corresponds to said data point. 214 U.S.P.Q. at 687.

102 Claim 6 read as follows: The method of claim 5 wherein said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner. *Id.* at 687.

103 *Id.* at 687.

104 *Id.*

105 *Id.* at 688.

106 684 F.2d 912, 214 U.S.P.Q. 673 (C.C.P.A. 1982).

107 214 U.S.P.Q. at 674.

108 *Id.* at 675.

109 *Id.* at 676–677.

110 688 F.2d 789, 215 U.S.P.Q. 193 (C.C.P.A. 1982).

111 Claim 1 read as follows:

A process for identifying [sic] locations of probable malfunction in a complex system, said process comprising the steps of:

(a) selecting a plurality of elements in the complex system, said elements having known locations;

(b) initializing a factor associated with each of said elements,

(c) testing the complex system for a response which response, if effective, requires proper functioning of certain said elements, the probable identity [sic] of at least some of these certain elements being known;

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

a series of tests and conclusions were drawn in accordance with a mathematical algorithm. The steps were as follows: in the *first* step, a source was selected for accumulation of data for the analysis; in the *second*, a factor was assigned to relate to the probability that an element was malfunctioning; in the *third*, data was gathered by testing; in the *fourth*, information was read into a computer; in the *fifth*, a comparison took place whereby the test outcomes were compared with stored data. Ultimately, the results were displayed.¹¹²

The appellants had essentially argued that their invention was concerned with replacing, in part, the thinking processes of a neurologist with a computer and admitted that the invention involved an algorithm which represented a mental process that a neurologist would follow.¹¹³

The CCPA stated that the issue was whether the mental process was applied to physical elements or process steps in an otherwise statutory process, machine, manufacture or composition of matter in accordance with §101.¹¹⁴ In answering this question, the claims were to be given their broadest possible interpretation consistent with the specification. The Court concluded that the algorithm represented a mental process that had not been applied to physical elements or process steps and, therefore, was not limited to an otherwise statutory process.¹¹⁵ It simply replaced, in part, the thinking processes of a doctor.

Another case evidencing the application of §101 to software-related inventions dealt with the Cash Management Account patent. In *Paine, Webber, Jackson & Curtis v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*,¹¹⁶ the District of Delaware held that apparatus claims¹¹⁷ directed to a system for processing

- (d) determining whether said response of the complex system was at least partially effective or ineffective;
- (e) *modifying* the factor associated with at least some of said elements known to be possible [sic] involved in the response in accordance with the effectiveness of the response; and
- (f) repeating steps (c), (d) and (e) for further responses of the complex system to obtain resultant factors for at least some of said elements

whereby said resultant factors are indicative of probable malfunction of their associated elements and thereby indicative of probable malfunction at the locations of these elements.

Claim 55 read as follows:

Apparatus for identifying [sic] locations of probably malfunction in a complex system in dependence upon individual responses to a plurality of tests of said system, whereby each response, if effective, requires the proper functioning of certain ones of a plurality of elements of said system, the locations of said plurality of elements and the probable identity [sic] of at least some of said certain ones of said elements being known, said apparatus comprising, in combination:

- (a) means for initializing a factor associated with each of said elements;
- (b) means for *modifying* the factor associated with at least some of said elements known to be possibly involved in a test response, in accordance with the effectiveness of the response, thereby to obtain resultant factors for at least some of said elements which are indicative of probable malfunction of their associated elements and thereby indicative of probable malfunction at the location of these elements; and
- (c) means for displaying the resultant factors associated with at least some of said elements.

215 U.S.P.Q. at 195-96.

112 *Id.* at 196-197.

113 *Id.* at 198.

114 *Id.*

115 *Id.* at 199.

116 564 F. Supp. 1358, 218 U.S.P.Q. 212 (D. Del. 1983).

117 Claims 1 and 3 read as follows:

1. In combination in a system for processing and supervising a plurality of composite subscriber accounts each comprising a margin brokerage account, a charge card and checks administered by a first institution, and participation in at least one short term investment, administered by a second institution, said system including brokerage account data file means for storing current information characterizing each subscriber margin brokerage account of the second institution, manual entry means for entering short term investment orders in the second institution, data receiving and verifying means for receiving and verifying charge card and check transactions from said first institution and short term investment orders from said manual entry means, means responsive to said brokerage account data file means and said data receiving and verifying means for generating an updated credit limit for each account, short term investment updating means responsive to said brokerage account data file means and said data receiving and verifying means for selectively generating short term investment transactions as required to generate and invest proceeds for subscribers' accounts, wherein said system includes plural such short term investments, said system further comprising means responsive to said short term updating means for allocating said short term investment transactions among said plural short term investments, communicating means to communicate said updated credit limit for each account to said first institution.
2. A combination as in claim 1 or 2 where said updated credit limit generating means comprises means for accumulating the amount of charge card usage and checks for each subscriber, means responsive to said brokerage account data file means for generating a subscriber updated credit limit measured by the difference between the limiting residual subscriber brokerage account securities loan value augmented by the value of the subscriber's short term investment, decremented by the value of the subscriber's aggregate expenditures and funds required for brokerage account purposes, means for reporting said updated credit limit to said brokerage account data file means.

218 U.S.P.Q. at 216.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

and supervising a number of accounts were statutory subject matter.

In that case, Paine, Webber contended that the claims “define[d] nothing more than the combination of familiar business systems, *that is*, a margin brokerage account, one or more money market funds, and a checking/charge account, which have been connected together so that financial information can be exchanged among them.”¹¹⁸ Paine, Webber also argued that the specification contained no disclosure of apparatus, that the “means” portion of the claims referred only to functional steps and that, in reality, the apparatus claims obscured the fact that the invention was merely a business method and, thus, outside the scope of §101.¹¹⁹

The District of Delaware held that the claims did not recite or preempt an algorithm.¹²⁰ The basis for the holding was the CCPA’s decisions in *Toma, supra, Phillips, supra, and Pardo, supra*, which read *Benson’s* use of the term algorithm narrowly to include only procedures for solving mathematical problems. Like *Toma* (method of operating a digital computer to translate languages, *e.g.*, Russian to English), *Phillips* (preparation of a set of printed architectural specifications, eliminating the need for handwritten specifications) and *Pardo* (process for connecting a sequential processor to a processor which was not dependent on the order in which data was received), the invention was directed to a methodology to effectuate a highly efficient business system and not a procedure for solving a mathematical problem.¹²¹

The court also rejected the contention that the claims were non-statutory because they were directed to a method of doing business. Relying on *Toma, supra, Phillips, supra* and *Johnston, supra*, the court held that it was improper to look to the product of a computer program where no algorithm exists.¹²² Rather, the analysis should focus, as in those cases, on the operation of the program on the computer. Because the operation of a computer and computer which effects

such operation are within the technological arts, it was irrelevant that the product of the invention (*e.g.*, translated text, architectural specifications, etc.) was outside the scope of §101.¹²³

E. The Prelude to *Bilski*—Three More Tests to Determine Patentability Under §101

With the inception of the CAFC in 1982, the Supreme Court essentially left the development of §101 in the context of software and business method inventions to the CAFC. For the next 26 years, the CAFC continued its efforts to develop clear rules on the patentability of such inventions. Unfortunately, two of the tests it adopted and later discarded gave way to its “machine or transformation” holding in *Bilski*—which was repudiated as the sole test of patentability by the Supreme Court.

In the 26-year time period beginning with the inception of the CAFC up until its 2008 decision in *Bilski*, there were three instructive cases which illustrate the continued struggle with respect to §101 and software related inventions. In *In re Alappat*,¹²⁴ claim 15, the only independent claim in issue, read as follows:

A rasterizer for converting vector list data representing sample magnitudes of an input waveform into anti-aliased pixel illumination intensity data to be displayed on a display means comprising:

- (a) means for determining the vertical distance between the endpoints of each of the vectors in the data list;
- (b) means for determining the elevation of a row of pixels that is spanned by the vector;
- (c) means for normalizing the vertical distance and elevation; and

¹¹⁸ *Id.* at 217.

¹¹⁹ *Id.* On that point, irrespective of the label—process or apparatus—the court noted that the threshold issue was whether the invention was statutory. *Id.*

¹²⁰ *Id.* at 220.

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

¹²⁴ 33 F.3d 1526, 31 U.S.P.Q.2d 1545 (Fed. Cir. 1994).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

(d) means for outputting illumination intensity data as a predetermined function of the normalized vertical distance and elevation.¹²⁵

The CAFC reversed the PTO's holding that the claims were unpatentable and held that claim 15 was drawn to a patentable machine and presented patentable subject matter under Section 101.¹²⁶ The CAFC's opinion was instructive in several ways. First, it re-confirmed the CCPA's holdings in the *Freeman and Prater* cases, *supra*, which had indicated that when a general purpose computer is programmed to carry out a claimed invention, the computer becomes a special purpose computer. Second, the court held that there were essentiality three exceptions to patentability under §101 which had been pointed out in Supreme Court opinions. Mathematical algorithms, equations, and calculations were not a fourth exception, but rather were included within the abstract idea exception. Third, the CAFC held that the test of patentability was whether the invention was useful, concrete and tangible.

Four years later in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, *supra*, the CAFC sounded the death knell for business method rejections to patentability under §101. That case claimed a data processing system. Claim 1 read as follows:

A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:

- (a) a computer processor means [a personal computer including a CPU] for processing data;
- (b) storage means [a data disk] for storing data on a storage medium;
- (c) first means [an arithmetic logic circuit configured to prepare the data disk to magnetically store selected data] for initializing the storage medium;

(d) second means [an arithmetic logic circuit configured to retrieve information from specific file, calculate incremental increases or decreases based on specific input, allocate the results on a percentage basis, and store the output in a separate file] for processing data regarding asset in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds, assets and for allocating the percentage share that each fund holds in the portfolio;

(e) third means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the result on a percentage basis and store the output in a separate file] for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;

(f) fourth means [an arithmetic logic circuit configured to retrieve information from a specific file, calculate incremental increases and decreases based on specific input, allocate the result on a percentage basis and store the output in a separate file] for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and

(g) fifth means [an arithmetic logic circuit configured to retrieve information from specific files, calculate that information on an aggregate basis and store the output in a separate file] for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.¹²⁷

In upholding the patentability of this claim, the CAFC discarded the *Freeman/Walter/Abele* test, and reaffirmed the test for patentability first set forth in *Alappat*. The next 10 years saw an explosion of business method patent applications and a plethora of patent infringement cases filed

¹²⁵ 31 U.S.P.Q. at 1553.
¹²⁶ *Id.* at 1558.
¹²⁷ 45 U.S.P.Q.2d at 1599.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

by patent trolls—all relying on the extremely broad “useful, concrete and tangible result” test for patentability.

A year later, the CAFC applied the *State Street Bank* holding to process claims in *AT&T Corp. v. Excel Communications, Inc.*,¹²⁸ Claim 1 of the patent at issue, U.S. Patent No. 5,333,184, read as follows:

A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of:

generating a message record for an interexchange call between an originating subscriber and a terminating subscriber, and including, in said message record, a primary interexchange carrier (PIC) indicator having a value which is a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one of said interexchange carriers.¹²⁹

The CAFC determined that the algorithm was applied in a practical manner and produced a useful result. Accordingly, the claims were held to be patentable under §101.¹³⁰

Ten years after the decision in *State Street Bank*, the CAFC again changed course in its *en banc Bilski* opinion. It again confirmed that the *Freeman/Walter/Abele* test was inadequate and should no longer be relied on. With respect to the “useful, concrete and tangible result” test first set forth in *Alappat* and confirmed in *State Street Bank*, the CAFC held that it was also inadequate. Instead, the CAFC indicated that the “machine or transformation” test was now the sole test to be used to determine patentability under §101.

It was this holding that was modified by the Supreme Court *Bilski* opinion wherein the Supreme Court stated that the “machine or transformation” test was not the sole test of

patentability under §101. Instead, it was a useful tool. With *Bilski’s* emphasis on the three exceptions to patentable subject matter set forth in *Benson, Flook and Diehr* and its holding that the “machine or transformation” test was but a useful tool, the law has come full circle back to the three exceptions (particularly the abstract ideas exception), with the lower courts again being left to apply them in specific cases as they had decades ago.

III. The Process of Applying the Supreme Court’s *Bilski* Holding Begins

A. The PTO’s Interim Guidance

On July 26, 2010, the PTO issued its “Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of *Bilski v. Kappos*.” The PTO published it in the Federal Register and requested comments by September 27, 2010.¹³¹

The PTO was particularly interested in receiving comments in three areas: (1) examples of claims that would fail the machine or transformation test, but still be patent eligible because they were not abstract ideas; (2) examples of claims that would meet the machine or transformation test but be patent ineligible because they were abstract ideas; and (3) examples of narrow categories of claims that would be unpatentable abstract ideas (*e.g.* how business should be conducted) and whether the categories are an attempt to patent the abstract idea.¹³²

As described by the PTO, the Interim Guidance provides factors to consider in determining eligibility under §101 in view of the abstract idea exception. Indeed, the PTO provided a method eligibility quick reference sheet with a list of factors pointing towards eligibility and a list pointing away from eligibility.¹³³

¹²⁸ 172 F.3d 1352, 50 U.S.P.Q. 2d 1447 (Fed. Cir. 1999), *cert. denied*, 528 U.S. 946 (1999).

¹²⁹ 50 U.S.P.Q. 2d at 1449.

¹³⁰ *Id.* at 1453.

¹³¹ 75 FR 43922 (July 27, 2010).

¹³² *Id.* at 43923.

¹³³ *Id.* at 43927.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

The PTO identified four sets of factors useful in determining whether a claimed invention was an abstract idea. The first two factors are based on the machine or transformation test. If a claimed invention involves or is executed by a particular machine or apparatus ... the claims are less likely to be an abstract idea.¹³⁴ If the performance of the claimed method “results in or otherwise involves a transformation of a particular article,” the claims are less likely to be an abstract idea.¹³⁵ Each of these two factors was accompanied by several sub-factors to further explain the guidance. These sub-factors included the particularity or generality of the elements of the machine or the transformation, whether the machine implemented the method, whether that implementation was extra-solution or field of use, the nature of the transformation and article transformed, and whether its involvement was extra-solution or field of use.¹³⁶ The third factor was whether the performance of the method involved “an application of a law of nature, even in the absence of a particular machine, apparatus or transformation.” If so, the claims would be less likely drawn to an abstract idea.¹³⁷ Again, several sub-factors were identified to further explain the guidance. These sub-factors included the particularity or generality of the application, whether the recitation of the law of nature involved subjective determinations, and whether its involvement was extra-solution or field of use.¹³⁸

The final factor was whether “a general concept (which could also be recognized in such terms as a principle, theory, plan or scheme) is involved in executing the steps of the method.”¹³⁹ If so, the claims are more likely to be an abstract idea. An extensive list of sub-factors was set forth to further explain the guidance. These general concepts included economic practices or theories, legal theories, mathematical concepts, mental activity, interpersonal interactions or relationships, teaching concepts, human behavior, and instructing (e.g. how to conduct a business).¹⁴⁰

Only after all the factors and sub-factors are considered and weighed—with the presence or absence of one factor not being determinative—can it be determined whether the claim as a whole is an abstract idea or not.¹⁴¹

B. Ultramercial v. Hulu

Ultramercial, LLC v. Hulu, LLC,¹⁴² is the first substantive post-*Bilski* judicial opinion. An appeal is currently pending. The patent was U.S. Patent No. 7,346,545, and it involved a method of online advertising where viewing an advertisement was traded for accessing media (e.g. a copyrighted work). The patent had two independent claims—claims 1 and 8. Claim 1 was representative and read as follows:

A method for distribution of products over the Internet via a facilitator, said method comprising the steps of: a first step of receiving, from a content provider, media products that are covered by intellectual-property rights protection and are available for purchase, wherein each said media product being comprised of at least one of text data, music data, and video data;

a second step of selecting a sponsor message to be associated with the media product, said sponsor message being selected from a plurality of sponsor messages, said second step including accessing an activity log to verify that the total number of times which the sponsor message has been previously presented is less than the number of transaction cycles contracted by the sponsor of the sponsor message;

a third step of providing the media product for sale at an Internet website;

a fourth step of restricting general public access to said media product;

¹³⁴ *Id.* at 43925.

¹³⁵ *Id.*

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ *Id.* at 43926.

¹⁴¹ *Id.*

¹⁴² 2010 U.S. Dist. Lexis 93453 (C.D. Cal. Aug. 13, 2010).

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

a fifth step of offering to a consumer access to the media product without charge to the consumer on the precondition that the consumer views the sponsor message;

a sixth step of receiving from the consumer a request to view the sponsor message, wherein the consumer submits said request in response to being offered access to the media product;

a seventh step of, in response to receiving the request from the consumer, facilitating the display of a sponsor message to the consumer;

an eighth step of, if the sponsor message is not an interactive message, allowing said consumer access to said media product after said step of facilitating the display of said sponsor message;

a ninth step of, if the sponsor message is an interactive message, presenting at least one query to the consumer and allowing said consumer access to said media product after receiving a response to said at least one query;

a tenth step of recording the transaction event to the activity log, said tenth step including updating the total number of times the sponsor message has been presented; and

an eleventh step of receiving payment from the sponsor of the sponsor message displayed.

In the claimed method, a user would need to click on a link and listen to or watch an advertisement before being permitted to access the copyrighted, linked material he desired. The court held this method to be unpatentable under *Bilski*, because the method was an abstract idea.¹⁴³ In reaching this conclusion, the court analyzed the *Bilski* opinion.

It described the “machine or transformation” test as providing

a major screening function, and concluded that the claimed invention failed this test.¹⁴⁴ The patent owner had argued that the claim was tied to a machine because of the “facilitator” language (claims 1 and 8), because of the use of the Internet (claim 8) and because of claim 16’s recitation of a computer memory.¹⁴⁵ The court indicated that the “facilitator” did not have to be a machine, but could be a person as indicated in the specification of the patent. As to the Internet, the court indicated that the Internet was not a machine, but was an abstraction. Finally, the court indicated that storing media on a computer memory does not tie the invention to a machine in any meaningful way.¹⁴⁶ In sum, the claims were broad enough so as not to require the use of a computer and, therefore, were abstract in nature. Even though the invention was intended to be used with a computer and the Internet, limiting its application thereto did not turn an unpatentable concept into a patentable invention.¹⁴⁷

The invention also failed the transformation part of the test. Ultramercial had argued that the claims passed the transformation test because they transformed copyrighted material from being inaccessible to being accessible. It was argued that this was a transformation because the media product which was accessed on one computer was downloaded to the memory of another computer. The court held that this was not a transformation of an article and, in any event, was incidental to the claimed invention.¹⁴⁸

The essence of the court’s holding was its conclusion that the claimed invention was not limited to a computer-specific application. Instead, it claimed a broad concept and was an abstract idea—the use of an advertisement as currency to obtain access to media. The added features or claim limitations (Internet, facilitator, passwords, activity logs, etc.) did not make it patentable. The court indicated that the claimed invention was an abstract idea “garnished with accessories” and would preempt the use of the invention in all fields.¹⁴⁹ In summarizing its holding and analysis, the court

¹⁴³ Slip Op. at 16–20.

¹⁴⁴ *Id.* at 2–3.

¹⁴⁵ *Id.* at 4.

¹⁴⁶ *Id.*

¹⁴⁷ *Id.* at 5.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* at 6.

Bilski v. Kappos—The Patentability of Software and Business Method Inventions: Have We Come Full Circle?

noted that the claimed invention fell closer to *Bilski* than it did to *Diehr*. The court stated:

the Court acknowledges that this case calls for the difficult task of deciphering whether the '545 invention falls under the *Bilski* or *Diehr* categories. In both, the claimed invention discloses a real-world application of a mathematical formula. In both, a well-known or basic principle is linked to its practical use. Yet in one (*Diehr*), the invention is patentable; in the other (*Bilski*), [it is] not. In deciding which one of the two categories the '545 patent fits, the Court consulted the machine or transformation test. The Court also noted that the similarities between the '545 patent and the *Bilski* patent point toward invalidity. Finally, the Court noted that the additional limitations beyond the abstract idea at the core of the '545 patent do not limit the claimed invention in a meaningful way. Therefore, the Court holds that the '545 patent does not cover patentable subject matter.¹⁵⁰

Conclusion

Software and business method technology has exploded in the last several decades. Unfortunately, the evolution of the law construing §101 has not been smooth and predictable.

While the lower courts have formulated and re-formulated many tests to draw a line between statutory and non-statutory subject matter, few of those tests have survived either *en banc* appellate or Supreme Court review. It can be argued that the recent Supreme Court *Bilski* case mostly bypassed 40 years of CCPA and CAFC precedent, with the Supreme Court reiterating its rulings in *Benson*, *Diehr* and *Flook*. Thus, after 40 years of struggling with the issues raised by §101, we have returned almost full circle to the rule that laws of nature, physical phenomena, and abstract ideas are not patentable subject matter. And once again, the lower courts have been left to fashion workable tests to distinguish between what is patentable and what is not patentable. However, unlike the status of the law on the issue when *Diehr* was decided in 1981, it is clear that the subsequently developed, judge-made "machine or transformation" test will be a mainstay of the §101 inquiry and will prove to be quite useful in "most cases" involving software and business method inventions.¹⁵¹

¹⁵⁰ *Id.* at 6

¹⁵¹ 130 S. Ct. at 3232.