

# Patenting Thoughts The Computer Implementation of a Mental Process: Insufficient to Overcome § 101’s Inventive Concept Requirement

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## I. Introduction

Since the first commercial use of the computer some sixty years ago,<sup>1</sup> federal courts have struggled to define a computer’s relevance to the patentability of a pro-

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<sup>1</sup> *Diamond v. Diehr*, 450 U.S. 175, 194 n.1 (1981) (Stevens, J., dissenting) (“ENIAC, the first general purpose electronic digital computer, was built in 1946. Unlike modern computers, this machine was externally programmed; its circuitry had to be manually rewired each time it was used to perform a new task. In 1952, a group of scientists at the Institute for Advanced Study completed

cess or method.<sup>2</sup> In that time, the Supreme Court has offered broad guidance to the lower courts, and the CAFC has responded with an attempt to use that guidance to assemble an explicit test.<sup>3</sup> This debate has led to over a decade of computer-related inventions being taken on a roller coaster ride in and out of eligibility. Most recently, the CAFC granted a request for rehearing en banc on this issue, and has requested briefing on specific questions regarding computers and patentable subject matter, in order to create a test tailored specifically to certain computer-implemented claims.<sup>4</sup> Because it may present a new test of patentability specifically for these computer-implemented claims, the opinion that the court creates will significantly impact the progress and industry of the internet generation.

This paper will analyze the questions presented by the CAFC in *CLS Bank International* and suggest the appropriate test. In Part I, it will present relevant history of subject matter eligibility. In Part II, it will address the special problem of uncertainty in patent litigation. In Part III, it will present a solution in the form of a “mental process” exclusion, or “inventive concept” requirement, for patent-eligible subject matter. In Part IV, it will apply this solution to the questions presented by the CAFC in *CLS Bank International*.

## II. The Development of Patent-Eligible Subject Matter

Defining the subject matter eligible for patent protection is hardly a new discussion. In fact, the history of subject matter eligibility predates the Constitution. In order to define the modern problem, a brief recitation of the history of the Patent Act, followed by a summary of relevant historical precedent, is necessary.

### A. History of the Patent Act

Statutorily eligible subject matter has remained essentially unchanged since Congress exercised its explicitly granted constitutional power to protect inventions and encourage innovation by enacting the first Patent Act in 1790.<sup>5</sup> The seeds of the U.S. patent system were first planted by the founding fathers, who wrote into the Constitution a congressional grant of power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”<sup>6</sup>

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MANIAC I, the first digital computer capable of operating upon stored programs, as opposed to hard-wired circuitry.” (citing Michael C. Gemignoni, *Legal Protection for Computer Software: The View from '79*, 7 RUTGERS COMPUTER & TECH. L.J. 269, 270 (1980) and Stanislaw M. Ulam, *Computers*, 211 SCI. AM. 202 (1964))).

<sup>2</sup> See *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972) (discussing the issue of patenting computer programs as processes).

<sup>3</sup> See, e.g., *In re Bilski*, 545 F.3d 943, 956 (Fed. Cir. 2008) (explaining the machine or transformation test).

<sup>4</sup> *CLS Bank Int'l*, 484 F. App'x at 560.

<sup>5</sup> Patent Act of 1790, ch. 7, 1 Stat. 109–12 (repealed 1793).

<sup>6</sup> U.S. CONST. art. 1, § 8, cl. 8.

However, the framers did not intend their constitutional language to be interpreted boundlessly, for they sought to avoid the English monarchy's practice of monopolizing specific trades to the detriment of the common good:

The clause is both a grant of power and a limitation. This qualified authority, unlike the power often exercised in the sixteenth and seventeenth centuries by the English Crown, is limited to the promotion of advances in the "useful arts." It was written against the backdrop of the practices—eventually curtailed by the Statute of Monopolies—of the Crown in granting monopolies to court favorites in goods or businesses which had long before been enjoyed by the public.<sup>7</sup>

The historical practices consisted of the following:

In the 16th and 17th centuries, the English Crown granted monopolies over entire types of business to specific individuals, for example the grant by James I to Darcy in 1600 of the exclusive right to manufacture or sell playing cards or the exclusive right to the printing business held by the London guild of booksellers and printers. The purpose of such monopolies "was to enrich the King . . . as well as the grantee, at the expense of the community." With this background in mind, the framers consciously acted to bar Congress from granting letters patent in particular types of business.<sup>8</sup>

Congress passed the first Patent Act in 1790, including provisions limiting patentable subject matter to "any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used," and granting the inventor the "sole and exclusive right and liberty of making, constructing, using and vending to others to be used, the said invention or discovery."<sup>9</sup>

Soon thereafter, in 1793, Congress amended the patent laws, changing the language to allow a patent for "any new and useful art, machine, manufacture or composition of matter."<sup>10</sup> This language, from 1793, is essentially the same as that used today.<sup>11</sup>

The next amendment in 1836 made no change to this statutory language.<sup>12</sup> The word "art" was changed to "process," defined as "process, art or method," in 1952.<sup>13</sup> By changing "art" to "process," Congress was merely preserving the original meaning of the Act by updating its vocabulary.<sup>14</sup> Likewise, the Supreme Court has made clear that the language amended in 1952 had no substantive effect on patent eligibility, stating that "[a]nalysis of the eligibility of a claim of patent protection for a 'process' did not change with the addition of that term to § 101."<sup>15</sup>

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<sup>7</sup> *Graham v. John Deere Co.*, 383 U.S. 1, 5 (1966).

<sup>8</sup> *In re Comiskey*, 554 F.3d 967, 976 (Fed. Cir. 2009) (citations omitted).

<sup>9</sup> Patent Act of 1790, ch. 7, § 1, 1 Stat. 109, 110 (repealed 1793).

<sup>10</sup> Patent Act of 1793, ch. 11, § 1, 1 Stat. 318, 319 (repealed 1836).

<sup>11</sup> *In re Comiskey*, 554 F.3d at 977.

<sup>12</sup> *In re Nuijten*, 500 F.3d 1346, 1352 (Fed. Cir. 2007) (citing Patent Act of 1836, ch. 357, § 6, 5 Stat. 117, 119).

<sup>13</sup> *Id.* (citing 35 U.S.C. § 100(b) (1952)).

<sup>14</sup> *See id.* at 1354–55 (citing S. REP. NO. 82-1979, at 5 (1952)) (explaining that "art" in this context is "practically synonymous with process or method").

<sup>15</sup> *Diamond v. Diehr*, 450 U.S. 175, 184 (1981).

## B. Relevant Precedent

At the time of this article's writing, in order to determine the patent eligibility of a given subject matter, the Court first looks to § 101's guideline that any process, machine, manufacture, or composition of matter is patentable, and then considers the judicially imposed limitations precluding from protection abstract ideas, physical phenomena, or laws of nature.<sup>16</sup> To that end, the "machine or transformation" test is an important and useful clue, but not the sole test, of patent eligibility.<sup>17</sup> This modern snapshot is the result of some forty years of precedent,<sup>18</sup> starting with the Supreme Court's holding that a formula in the abstract is not patentable subject matter in *Gottschalk v. Benson*,<sup>19</sup> in the same way that a formula with insignificant post-solution activity was held to be ineligible in *Parker v. Flook*,<sup>20</sup> compared to an application of a formula which may well be deserving of patent protection, as stated in *Diamond v. Diehr*,<sup>21</sup> and finally that a fundamental concept, like that of financial hedging in *Bilski v. Kappos*,<sup>22</sup> is ineligible for essentially the same reason.

In 1972, the Supreme Court decided *Gottschalk v. Benson*, its first decision related to the subject matter eligibility of a computer-related invention.<sup>23</sup> In *Benson*, the patent at issue was directed "to the processing of data by program and more particularly to the programmed conversion of numerical information in general-purpose digital computers."<sup>24</sup> Specifically, the patent "claimed a method for converting binary-coded decimal (BCD) numerals into pure binary numerals."<sup>25</sup> The

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<sup>16</sup> 35 U.S.C. § 101 (2006); *see also* 35 U.S.C. § 100(b) (2006) (defining the term "process" to mean "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material"); *see generally* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

<sup>17</sup> *See Bilski*, 130 S. Ct. at 3221.

<sup>18</sup> This paper also acknowledges three prior decisions that are regarded by some as the historic cases that illustrate how excluding abstract ideas limited claim scope before *Gottschalk v. Benson*. *See* Mark A. Lemley et. al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1332 (2011). *O'Reilly v. Morse*, 56 U.S. 62 (1853) (invalidating Samuel Morse's telegraph patent because in addition to its valid claim on the telegraph machine itself, the patent attempted to claim all transmission of printed information by an electromagnetic signal by any means, which would foreclose future inventors who may discover modes of writing or printing at a distance by means of the electric or galvanic current); *Dolbear v. Am. Bell Tel. Co. (The Telephone Cases)*, 126 U.S. 1 (1888) (allowing Alexander Graham Bell his patent to the transmission of voice over a closed circuit, using either a vibration or a resistance method, only one of which was ultimately reduced to practice, because he was able to describe "the exact electrical condition that must be created to accomplish his purpose," or in other words an application of the inventive principle, and did not claim all transmissions of voice by any means or machinery, like Morse had); *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86 (1939) (holding that a patent on the use of a well-known formula to calculate optimal wire lengths to receive radio signals was a patent-eligible application of the equation, and thus a practical application of an abstract idea was eligible for patent).

<sup>19</sup> *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972).

<sup>20</sup> *Parker v. Flook*, 437 U.S. 584, 594–96 (1978).

<sup>21</sup> *Diamond v. Diehr*, 450 U.S. 175, 191–93 (1981).

<sup>22</sup> *Bilski*, 130 S. Ct. at 3218 (stating that the concept of hedging "is an unpatentable abstract idea, just like the algorithms at issue in *Benson* and *Flook*").

<sup>23</sup> *Benson*, 409 U.S. at 63.

<sup>24</sup> *Id.* at 64.

<sup>25</sup> *Id.* at 64–65.

claimed method operated by “programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form.”<sup>26</sup> To function,

[t]he method sought to be patented varies the ordinary arithmetic steps a human would use by changing the order of the steps, 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.<sup>27</sup>

The Court defined a digital computer as “operat[ing] on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand.”<sup>28</sup> Therefore, the claimed process merely encompassed programming a computer to perform calculations that, in the alternative, could “be performed without a computer.”<sup>29</sup>

The Court based its holding on the rule that “[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”<sup>30</sup> The Court held the claimed process to be unpatentable because

[h]ere the “process” claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may (1) vary from the operation of a train to verification of drivers’ licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus.<sup>31</sup>

Therefore, the practical effect of patenting the formula for converting BCD numerals to pure binary numerals “would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.”<sup>32</sup> In so holding, the Court handily foreclosed the possibility that a patent should ever pre-empt so much; thus, the Court invalidated a computer-implemented formula in the abstract.

After the invalidation in *Benson* of patenting computer-implemented formulas in the abstract, the next landmark Supreme Court decision came six years later, in *Parker v. Flook*, where the patent claimed a formula in a specific application.<sup>33</sup> In *Flook*, the patent at issue claimed a method of updating the “alarm limits” of an automotive catalytic conversion process.<sup>34</sup> The claimed method consisted of three steps: “an initial step which merely measures the present value of the process varia-

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<sup>26</sup> *Id.* at 65.

<sup>27</sup> *Id.* at 67.

<sup>28</sup> *Id.* at 65.

<sup>29</sup> *Benson*, 409 U.S. at 67.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.* at 68.

<sup>32</sup> *Id.* at 72.

<sup>33</sup> *Parker v. Flook*, 437 U.S. 584, 584 (1978).

<sup>34</sup> *Id.* at 585 (“An ‘alarm limit’ is a number. During catalytic conversion processes, operating conditions such as temperature, pressure, and flow rates are constantly monitored. When any of these ‘process variables’ exceeds a predetermined ‘alarm limit,’ an alarm may signal the presence of an abnormal condition indicating either inefficiency or perhaps danger.”).

ble (*e.g.*, the temperature); an intermediate step which uses an algorithm to calculate an updated alarm-limit value; and a final step in which the actual alarm limit is adjusted to the updated value.”<sup>35</sup>

At the time the patent at issue in *Flook* was applied for, the automotive catalytic converter had been public knowledge for some time.<sup>36</sup> So “[t]he only difference between the conventional methods of changing alarm limits and that described in respondent’s application rests in the second step—the mathematical algorithm or formula.”<sup>37</sup> It followed that the only novel nature of the patent was from the use of a mathematical formula by a computer to accelerate its solution and thus solve the post-solution objective of adjusting the alarm limit.<sup>38</sup>

The Court, recognizing that “the discovery of a novel and useful mathematical formula may not be patented,”<sup>39</sup> instead addressed “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.”<sup>40</sup> The Court held that

[t]he process itself, not merely the mathematical algorithm, must be new and useful. Indeed, the novelty of the mathematical algorithm is not a determining factor at all. Whether the algorithm was in fact known or unknown at the time of the claimed invention, as one of the “basic tools of scientific and technological work,” it is treated as though it were a familiar part of the prior art.<sup>41</sup>

Furthermore,

[t]he notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.<sup>42</sup>

So, in its simplest terms, the Court held that “a claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101.”<sup>43</sup>

The Court then focused on how a patent may apply a formula in a non-abstract way and therefore be considered patent-eligible subject matter in *Diamond v.*

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<sup>35</sup> *Id.* (footnote omitted).

<sup>36</sup> See Catalytic Structure and Composition, U.S. Patent No. 2,742,437 (filed Sept. 29, 1952) (issued Apr. 17, 1956).

<sup>37</sup> *Flook*, 437 U.S. at 585–86.

<sup>38</sup> *Id.* at 586 (“Although the computations can be made by pencil and paper calculations, the abstract of disclosure makes it clear that the formula is primarily useful for computerized calculations producing automatic adjustments in alarm settings.”).

<sup>39</sup> *Id.* at 585.

<sup>40</sup> *Id.*

<sup>41</sup> *Id.* at 591–92.

<sup>42</sup> *Id.* at 590 (footnote omitted).

<sup>43</sup> *Flook*, 437 U.S. at 595 n.18.

*Diehr*.<sup>44</sup> In *Diehr*, the patent application claimed “a process for curing synthetic rubber which include[d] in several of its steps the use of a mathematical formula and a programmed digital computer . . . .”<sup>45</sup> The claimed process “use[d] a mold for precisely shaping the uncured material under heat and pressure and then curing the synthetic rubber in the mold so that the product [would] retain its shape and be functionally operative after the molding is completed.”<sup>46</sup>

According to the applicants, “[a]chieving the perfect cure depend[ed] upon several factors including the thickness of the article to be molded, the temperature of the molding process, and the amount of time that the article is allowed to remain in the press.”<sup>47</sup> The rubber molding industry at the time had already acknowledged the possibility of using the Arrhenius equation<sup>48</sup> to calculate, as a function of temperature and geometry, the earliest possible time to open the press and remove the cured product.<sup>49</sup> However, the industry had not been able to obtain uniformly accurate cures because the temperature of the molding press could not be precisely measured, thus making it difficult to do the necessary computations to determine cure time.<sup>50</sup>

The inventive concept, according to the applicants, was the process of constantly measuring the actual temperatures inside the mold.<sup>51</sup> These temperature measurements were then automatically fed into a computer which repeatedly recalculated the cure time by use of the Arrhenius equation.<sup>52</sup> When the recalculated time equaled the actual time that had elapsed since the press was closed, the computer would signal a device to open the press.<sup>53</sup> According to the applicants, the continuous measuring of the temperature inside the mold cavity, the feeding of this information to a digital computer which constantly recalculates the cure time, and the signaling by the computer to open the press, were all new in the art.<sup>54</sup>

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<sup>44</sup> *Diamond v. Diehr*, 450 U.S. 175 (1981).

<sup>45</sup> *Id.* at 177.

<sup>46</sup> *Id.* (footnote omitted).

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* at 177 n.2 (“The equation is named after its discoverer Svante Arrhenius and has long been used to calculate the cure time in rubber-molding presses. The equation can be expressed as follows:  $\ln v = CZ + x$ , wherein  $\ln v$  is the natural logarithm of  $v$ , the total required cure time;  $C$  is the activation constant, a unique figure for each batch of each compound being molded, determined in accordance with rheometer measurements of each batch;  $Z$  is the temperature in the mold; and  $x$  is a constant dependent on the geometry of the particular mold in the press.”).

<sup>49</sup> *Id.* at 178.

<sup>50</sup> *Diehr*, 450 U.S. at 178 (“Because the temperature *inside* the press has heretofore been viewed as an uncontrollable variable, the conventional industry practice has been to calculate the cure time as the shortest time in which all parts of the product will definitely be cured, assuming a reasonable amount of mold-opening time during loading and unloading. But the shortcoming of this practice is that operating with an uncontrollable variable inevitably led in some instances to overestimating the mold-opening time and overcuring the rubber, and in other instances to underestimating that time and undercuring the product.”).

<sup>51</sup> *Id.*

<sup>52</sup> *Id.*

<sup>53</sup> *Id.* at 179.

<sup>54</sup> *Id.*

The Court found that the applicants

d[id] not seek to patent a mathematical formula. Instead, they s[ought] patent protection for a process of curing synthetic rubber. Their process admittedly employ[ed] a well-known mathematical equation, but they d[id] not seek to pre-empt the use of that equation. Rather, they s[ought] only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.<sup>55</sup>

Additionally, “a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer.”<sup>56</sup>

Because “a scientific truth, or the mathematical expression of it, is not a patentable invention, [but] a novel and useful structure created with the aid of knowledge of scientific truth may be,”<sup>57</sup> the Court held that “Arrhenius’ equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101.”<sup>58</sup> In so holding, the Court remarked that

when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment. Similarly, insignificant post-solution activity will not transform an unpatentable principle into a patentable process. To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection.<sup>59</sup>

The Supreme Court waited almost three decades after *Diehr* to issue another patent eligibility decision.<sup>60</sup> In the meantime, the CAFC had handed down two significant decisions regarding subject matter eligibility, first categorically allowing a certain type of patent called the business method patent in 1998,<sup>61</sup> and then rejecting

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<sup>55</sup> *Id.* at 187.

<sup>56</sup> *Diehr*, 450 U.S. at 187 (“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.”).

<sup>57</sup> *Id.* at 188 (quoting *Mackay Radio & Tel. Co. v. Radio of Am.*, 306 U.S. 86, 94 (1939)).

<sup>58</sup> *Id.*

<sup>59</sup> *Id.* at 191–92 (citations omitted).

<sup>60</sup> That is, one regarding computer-related abstract subject matter. The Supreme Court opined on other patent eligibility questions in the meantime. *E.g.*, *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.*, 534 U.S. 124 (2001) (holding that newly developed plant breeds are patentable subject matter).

<sup>61</sup> *See State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (holding that “the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces ‘a useful, concrete and tangible result’—a final share price”).

them, while reducing the Supreme Court's subject matter precedent to the Machine or Transformation (MoT) test as the sole test governing § 101 analyses, in 2008.<sup>62</sup>

In 2010, the Supreme Court issued its decision in *Bilski v. Kappos*,<sup>63</sup> affirming the practical exile of business method patents from the realm of eligible subject matter,<sup>64</sup> while overruling use of the MoT test as the sole test of patentable subject matter under § 101.<sup>65</sup> The patent at issue claimed “a procedure for instructing buyers and sellers how to protect against the risk of price fluctuations in a discrete section of the economy.”<sup>66</sup> By way of representative Claim 1, it consisted of the following steps:

- (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.<sup>67</sup>

Additionally, “[c]laim 4 put[ ] the concept articulated in claim 1 into a simple mathematical formula.”<sup>68</sup> The remaining claims, the dependent claims, explained how the claimed process could be applied to the energy market.<sup>69</sup> Some of these claims

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<sup>62</sup> See *In re Bilski*, 545 F.3d 943, 956, 959–60 (Fed. Cir. 2008) (holding that “the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under § 101,” and that “the ‘useful, concrete and tangible result’ inquiry is inadequate”) (footnote omitted).

<sup>63</sup> *Bilski v. Kappos* (*Bilski II*), 130 S. Ct. 3218 (2010).

<sup>64</sup> The practical exile, but not the actual exile. See *id.* at 3229 (“[I]f the Court of Appeals were to succeed in defining a narrower category or class of patent applications that claim to instruct how business should be conducted, and then rule that the category is unpatentable because, for instance, it represents an attempt to patent abstract ideas, this conclusion might well be in accord with controlling precedent. But beyond this or some other limitation consistent with the statutory text, the Patent Act leaves open the possibility that there are at least some processes that can be fairly described as business methods that are within patentable subject matter under § 101. [But] even if a particular business method fits into the statutory definition of a ‘process,’ that does not mean that the application claiming that method should be granted.”) (citations omitted).

<sup>65</sup> *Id.* at 3226–27 (stating that “[t]he Court of Appeals incorrectly concluded that this Court has endorsed the machine-or-transformation test as the exclusive test,” and holding that although “the machine-or-transformation test is a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101[ , it] is not the sole test for deciding whether an invention is a patent-eligible ‘process.’”).

<sup>66</sup> *Id.* at 3223 (“[The claimed invention] explains how buyers and sellers of commodities in the energy market can protect, or hedge, against the risk of price changes. . . . Claim 1 describes a series of steps instructing how to hedge risk.”).

<sup>67</sup> *Id.* at 3223–24 (citation omitted).

<sup>68</sup> *Id.* at 3223.

<sup>69</sup> See *Bilski II*, 130 S. Ct. at 3224 (“[C]laim 2 claims ‘[t]he method of claim 1 wherein said commodity is energy and said market participants are transmission distributors.’”) (citation omitted).

also suggest familiar statistical approaches to determine the inputs to use in claim 4's equation.<sup>70</sup>

The Court looked to *Benson*, *Flook*, and *Diehr*, and concluded that the claims at issue in *Bilski II* were “not a patentable ‘process.’”<sup>71</sup> “Rather than adopting categorical rules that might have wide-ranging and unforeseen impacts, the Court resolve[d] this case narrowly on the basis of . . . *Benson*, *Flook*, and *Diehr*, which show that petitioners’ claims are not patentable processes because they are attempts to patent abstract ideas.”<sup>72</sup> Claims 1 and 4 in petitioners’ applications explain the basic concept of hedging, or protecting against risk.<sup>73</sup> In other words, the applicants sought “to patent both the concept of hedging risk and the application of that concept to energy markets.”<sup>74</sup>

Allowing the patent on risk hedging “would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.”<sup>75</sup> Therefore, “[t]he 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 *Benson* and *Flook*.”<sup>76</sup>

### III. The Special Problem of Uncertainty in Patent Litigation

Since *Bilski II*, one line of cases within the CAFC has focused on methods of doing business using a computer, as opposed to methods of doing business in a vacuum.<sup>77</sup> In attempting to adjudicate this new type of patent using the precedent handed down by *Benson*, *Flook*, *Diehr*, and *Bilski II*, the court has become muddled in the task of defining the boundaries of an abstract idea. This uncertainty has led, in the two years since *Bilski II*, to about as many of the eleven cases discussing patent eligibility based on computer-related abstract ideas to be found eligible as those found to be ineligible.<sup>78</sup> The CAFC’s uncertainty is a result of the court’s lack of a

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<sup>70</sup> *Id.* (“[C]laim 7 advises using well-known random analysis techniques to determine how much a seller will gain ‘from each transaction under each historical weather pattern.’”) (citation omitted).

<sup>71</sup> *Id.* at 3231.

<sup>72</sup> *Id.* at 3225, 3229–30 (“The Court’s precedents provide three specific exceptions to § 101’s broad patent-eligibility principles: ‘laws of nature, physical phenomena, and abstract ideas.’”) (citation omitted).

<sup>73</sup> *Id.* at 3231.

<sup>74</sup> *Id.* at 3229.

<sup>75</sup> *Bilski II*, 130 S. Ct. at 3231.

<sup>76</sup> *Id.*

<sup>77</sup> Like those upheld in *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008), and invalidated in *Bilski II*.

<sup>78</sup> *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) (eligible); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011) (not eligible); *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323 (Fed. Cir. 2011), *vacated*, *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012) (eligible); *Fuzzysharp Techs. Inc. v. 3DLabs Inc.*, 447 F. App’x 182, 183 (Fed. Cir. 2011) (unpublished) (eligible); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315 (Fed. Cir. 2012) (not eligible); *Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317 (Fed. Cir. 2012) (not eligible); *CLS Bank Int’l v. Alice Corp. Pty.*, 685 F.3d 1341 (Fed. Cir. 2012) (eligible), *vacated*, *CLS Bank Int’l v. Alice Corp. Pty.*, 484 F. App’x 559 (Fed. Cir. 2012) (unpublished) (per curi-

firm grasp on what an abstract idea really is and of what sort of an application of an abstract idea may be eligible for patent protection.

In deciding *Bilski II*, the Supreme Court gave the CAFC very specific ambiguous instructions regarding how to decide patent eligibility under § 101.<sup>79</sup> So, naturally, the court's first order of business immediately following *Bilski II* was to quantify the concept of an abstract idea so that it could apply it faithfully to the Supreme Court's binding precedent. The court, however, abstained from re-defining the term,<sup>80</sup> and instead ruled that despite the lack of a clear indication of what an abstract idea might be, counsel must convince the court "that this disqualifying characteristic should exhibit itself *so manifestly* as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act."<sup>81</sup> Intended to recognize "the clear congressional mandate that a very broad swath of inventions be eligible for patent protection," the "manifestly evident" standard was born.<sup>82</sup>

The "manifestly evident" standard's attempt to give effect to the Supreme Court's ban on abstract ideas proved unreliable, for after its announcement, the new standard was mostly ignored by the court.<sup>83</sup> When the court did apply the standard, it did so conclusively and without explanation.<sup>84</sup> Ultimately, in a decision it vacated soon after, the court went a step further to hold that

[u]nless the single most reasonable understanding is that a claim is directed to nothing more than a fundamental truth or disembodied concept, with no limitations in the claim attaching that idea to a specific application, it is inappropriate to hold that the claim is directed to a patent ineligible "abstract idea" under 35 U.S.C. § 101.<sup>85</sup>

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um); Bancorp Servs., LLC v. Sun Life Assurance Co., 687 F.3d 1266 (Fed. Cir. 2012) (not eligible); Highmark, Inc. v. Allcare Health Mgmt. Sys., Inc., 687 F.3d 1300 (Fed. Cir. 2012) (eligible); Whitserve, LLC v. Computer Packages, Inc., 694 F.3d 10 (Fed. Cir. 2012) (not eligible).

<sup>79</sup> See *Bilski II*, 130 S. Ct. at 3231 (offering no specific definition of an abstract idea beyond examples of abstract ideas, like the concept of hedging at issue in the present case and the algorithms at issue in *Benson* and *Flook*).

<sup>80</sup> The CAFC had defined the term in *In re Alappat*, 33 F.3d 1526, 1543 (Fed. Cir. 1994), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (holding that abstract ideas constitute disembodied concepts or truths which are not "useful" from a practical standpoint standing alone, i.e., they are not "useful" until reduced to some practical application), but did not rely on this definition in its later decisions.

<sup>81</sup> *Research Corp. Techs., Inc.*, 627 F.3d at 868.

<sup>82</sup> *Dealertrack, Inc.*, 674 F.3d at 1333 (citations omitted).

<sup>83</sup> After its announcement of the standard in *Research Corp. Techs., Inc.*, the court mentioned the new "manifestly evident" standard in only four of the next ten cases on the subject. It applied the standard in three, invalidating the patents at issue in *Dealertrack, Inc.*, 674 F.3d 1315, and *CLS Bank Int'l*, CLS Bank Int'l v. Alice Corp. Pty., 685 F.3d 1341 (Fed. Cir. 2012), *vacated*, CLS Bank Int'l v. Alice Corp. Pty., 484 F. App'x 559 (Fed. Cir. 2012) (unpublished) (per curiam), and upholding the patent at issue in *Ultramercial LLC*, 657 F.3d 1323.

<sup>84</sup> See, e.g., *Dealertrack, Inc.*, 674 F.3d at 1333 (reciting the "manifestly evident" standard and stating simply that "[i]n this case, however, we are compelled to conclude that the claims are invalid as being directed to an abstract idea preemptive of a fundamental concept or idea that would foreclose innovation in this area").

<sup>85</sup> *CLS Bank Int'l*, 685 F.3d at 1352.

But in vacating this decision and granting the rehearing en banc at issue in this paper, the court essentially acknowledged that it had tried to catch the Supreme Court's *Bilski II* § 101 throw, but instead had fumbled the ball.

In the process of fumbling the *Bilski II* § 101 standard, the court acknowledged that its true source of confusion was the difficulty of understanding the concept of an abstract idea.<sup>86</sup> In fact, the court was so befuddled in its third analysis under its new “manifestly evident” standard that after an extensive discussion of the abstract idea concept it ultimately skipped the § 101 analysis to hold that a patent should first be evaluated under §§ 102,<sup>87</sup> 103,<sup>88</sup> and 112<sup>89</sup> so that “it would be unnecessary to enter the murky morass that is § 101 jurisprudence.”<sup>90</sup>

Throughout these cases, as the court determined if and when the application of an otherwise abstract idea resulted in patent eligibility, this uncertainty led to unpredictable results.<sup>91</sup> Of the ten relevant cases heard by the CAFC and decided under § 101, five claimed applications were correctly found invalid,<sup>92</sup> three claimed

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<sup>86</sup> See *id.* at 1348–49 (“The abstractness of the ‘abstract ideas’ test to patent eligibility has become a serious problem, leading to great uncertainty and to the devaluing of inventions of practical utility and economic potential.”).

<sup>87</sup> 35 U.S.C. § 102 (2006) (defining the standard of patentable novelty).

<sup>88</sup> 35 U.S.C. § 103 (2006) (defining the standard of patentable non-obviousness).

<sup>89</sup> 35 U.S.C. § 112 (2006) (defining the requirements of a patent’s specification).

<sup>90</sup> See *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260 (Fed. Cir. 2012) (“[C]ourts could avoid the swamp of verbiage that is § 101 by exercising their inherent power to control the processes of litigation, and insist that litigants initially address patent invalidity issues in terms of the conditions of patentability defenses as the statute provides, specifically §§ 102, 103, and 112. If that were done in the typical patent case, litigation over the question of validity of the patent would be concluded under these provisions. . . .”) (internal citation omitted). However, the Supreme Court treated a patent for “a machine system for automatic record-keeping of bank checks and deposits” in the same manner in 1976, see *Dann v. Johnston*, 425 U.S. 219, 220 (1976) (“Petitioner and respondent, as well as various Amici, have presented lengthy arguments addressed to the question of the general patentability of computer programs. We find no need to treat that question in this case, however, because we conclude that in any event respondent’s system is unpatentable on grounds of obviousness.”) (internal citation omitted). *Contra In re Comiskey*, 554 F.3d 967, 973 (Fed. Cir. 2009) (“Only if the requirements of § 101 are satisfied is the inventor ‘allowed to pass through to’ the other requirements for patentability, such as novelty under § 102 and, of pertinence to this case, non-obviousness under § 103.”) (citation omitted).

<sup>91</sup> *CLS Bank Int’l*, 685 F.3d at 1351 (“[A] claim that is drawn to a *specific way* of doing something with a computer is likely to be patent eligible whereas a claim to *nothing more than the idea* of doing that thing on a computer may not. But even with that appreciation, great uncertainty remains, and the core of that uncertainty is the meaning of the ‘abstract ideas’ exception.”) (emphasis in original) (footnote omitted).

<sup>92</sup> *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1367 (Fed. Cir. 2011) (regarding a “method and system for detecting fraud in a credit card transaction between [a] consumer and a merchant over the Internet”); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1316 (Fed. Cir. 2012) (regarding “a computer-aided method and system . . . for processing credit applications over electronic networks”); *Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1318 (Fed. Cir. 2012) (regarding “an investment tool designed to enable property owners to buy and sell properties without incurring tax liability”); *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1270 (Fed. Cir. 2012) (regarding “a computerized means for tracking the book value and market value of [life insurance] policies and calculating the credits representing the amount the stable value pro-

applications were incorrectly found to be valid,<sup>93</sup> and two claimed applications were correctly found to be valid,<sup>94</sup> and no claimed application was incorrectly found to be invalid.

In correctly finding certain computer-implemented claims to be invalid, the court noted that “[t]he mere implementation on a computer of an otherwise ineligible abstract idea will not render the asserted ‘invention’ patent eligible.”<sup>95</sup> This concept dates back to the Supreme Court’s *Flook* rule that “post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process[,] exalt[ing] form over substance.”<sup>96</sup> As stated by the CAFC,

[i]n order for the addition of a machine to impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed, rather than function solely as an obvious mechanism for permitting a solution to be achieved more quickly, i.e., through the utilization of a computer for performing calculations.<sup>97</sup>

The court correctly found at least one patent to satisfy this “significant part” inquiry and therefore be eligible subject matter. For example, in *Research Corp.*, the court held that the claimed method of digital image halftoning, despite incorporating mathematical formulas, did not claim the mathematical formula itself; rather, it claimed a process of halftoning in computer applications, and was therefore eligible for patent.<sup>98</sup> In *Fuzzysharp*, the court vacated the lower court’s finding of invalidity based on the patent’s claimed method of hidden surface detection in a com-

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tested writer must guarantee and pay should the policy be paid out prematurely”); *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 10 (Fed. Cir. 2012) (regarding “automated delivery of professional services and technology for backing up client data”).

<sup>93</sup> *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1324 (Fed. Cir. 2011), *vacated*, *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012) (regarding “a method for distributing copyrighted products ‘e.g., songs, movies, books,’ over the Internet where the consumer receives a copyrighted product for free in exchange for viewing an advertisement, and the advertiser pays for the copyrighted content”); *CLS Bank Int’l*, 685 F.3d at 1341 (regarding “a computerized trading platform for exchanging obligations in which a trusted third party settles obligations between a first and second party so as to eliminate ‘settlement risk’”); *Highmark, Inc. v. Allcare Health Mgmt. Sys., Inc.*, 687 F.3d 1300, 1306 (Fed. Cir. 2012) (regarding a diagnostic system for determining whether a recommended treatment is appropriate and denying authorization until the treatment has been approved).

<sup>94</sup> *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 862–63 (Fed. Cir. 2010) (regarding a method of digital half-toning for digital printers); *Fuzzysharp Techs. Inc. v. 3DLabs Inc.*, 447 F. App’x 182, 183 (Fed. Cir. 2011) (unpublished) (regarding an improved method of hidden surface detection).

<sup>95</sup> *CLS Bank Int’l*, 685 F.3d at 1351.

<sup>96</sup> *Parker v. Flook*, 437 U.S. 584, 590 (1978).

<sup>97</sup> *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010).

<sup>98</sup> *Research Corp. Techs., Inc.*, 627 F.3d at 862–63, 869 (“Digital images often show shades of gray and even a spectrum of colors. Nonetheless, computer displays and printers can only use a limited number of primary colors to display these digital images. Halftoning bridges this gap by simulating a continuous tone image through the use of dots. Halftoning techniques allow computers to present many shades and color tones with a limited number of pixel colors.”).

puter screen's display of a 3-D object. The court noted that on remand, claims may be found to be eligible applications of an abstract idea.<sup>99</sup>

However, misinterpretation of this precedent led the court to several curious validations of what should have been invalidly abstract. First, in *Ultramercial*, the court held that the claimed method of using advertising as a form of currency disclosed a practical application of the idea because restricting the concept to the Internet involved an extensive computer interface.<sup>100</sup> Likewise, in the vacated *CLS Bank International* opinion discussed above, the court held that the claimed method of exchanging obligations between parties using a computer covered the practical application of a business concept in a specific way because the computer was required to implement the steps of the patent.<sup>101</sup> These holdings exhibit a fundamental misunderstanding of the limitations that must be imposed on an abstract idea in order to instill patent eligibility. In finding a patent eligible because a computer is necessary for the practical application of the abstract idea, the court misinterpreted the guideposts set by *Benson*, *Flook*, *Diehr*, and *Bilski II*.

Perhaps in recognition of its misunderstanding, the court granted CLS Bank's petition to rehear *CLS Bank International* en banc, and vacated its written opinion.<sup>102</sup> The court presented the following questions for renewed and amicus briefing:

- a. What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible "abstract idea"; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?
- b. In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?<sup>103</sup>

#### IV. The Mental Process or Inventive Concept Solution

The solution to the CAFC's confusion is a formal affirmation of the mental process exception as the fourth categorically unpatentable subject matter, or in other words, an inventive concept requirement for subject matter eligibility. Merely replacing the human brain with a "computer" should not make an otherwise patent-ineligible mental process eligible for patent. This exception and its corollary requirement are consistent with historical subject matter eligibility precedent, have been recently utilized by both the CAFC and the Supreme Court, and reasonably fill the logical gap between patent-ineligible abstract ideas and their patent-eligible im-

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<sup>99</sup> See *Fuzzysharp*, 447 F. App'x at 186.

<sup>100</sup> *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1328 (Fed. Cir. 2011), *vacated*, *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012).

<sup>101</sup> *CLS Bank Int'l v. Alice Corp. Pty.*, 685 F.3d 1341, 1355 (Fed. Cir. 2012), *vacated*, *CLS Bank Int'l v. Alice Corp. Pty.*, 484 F. App'x 559 (Fed. Cir. 2012) (unpublished) (per curium).

<sup>102</sup> *CLS Bank Int'l v. Alice Corp. Pty.*, 484 F. App'x 559, 559 (Fed. Cir. 2012) (unpublished) (per curium).

<sup>103</sup> *Id.* at 559–60.

plementations including computer implementations that confounded the CAFC in its *CLS Bank International* decision.

#### A. Historical Precedent

First, the bar on mental process subject matter is not unfamiliar to the court. It was formally acknowledged by the Supreme Court in 1972 in *Gottschalk v. Benson*.<sup>104</sup> It is unclear exactly what significance the Court intended, due to its seemingly insignificant mention. Given the development and then abandonment of the “mental steps” doctrine by the Court of Customs and Patent Appeals (CCPA) leading up to *Benson*, it is clear that with its passing reference, the Court curtly affirmed the earlier precedent that had been since overruled by lower courts, establishing that a computer program performing an otherwise mental process was outside of the scope of § 101.<sup>105</sup>

Nine years later, in his dissent in *Diehr*, Justice Stevens explained that although the Court had “made no reference to the lower court’s rejection of the men-

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<sup>104</sup> *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”).

<sup>105</sup> See generally *Diamond v. Diehr*, 450 U.S. 175, 195–96 (1981) (Stevens, J., dissenting) (“Prior to 1968, [the “mental steps” doctrine excluded processes involving mental operations from the realm of patent-eligible subject matter] . . . based on the familiar principle that a scientific concept or mere idea cannot be the subject of a valid patent. The doctrine was regularly invoked to deny patents to inventions consisting primarily of mathematical formulae or methods of computation. It was also applied against patent claims in which a mental operation or mathematical computation was the sole novel element or inventive contribution; it was clear that patentability could not be predicated upon a mental step.”). Under the function of a machine doctrine, an inventor cannot have a patent for the function or abstract effect of a machine, but only for the machine which produces it, as first announced in *Coming v. Burden*, 56 U.S. 252, 268 (1853). In 1968, the Patent Office adopted guidelines by the President’s Commission on the Patent System, based in part on the mental-steps doctrine. A computer program, whether claimed as an apparatus or a process, was unpatentable; however, a programmed computer could be a component of a patentable process if combined with unobvious elements to produce a physical result. However, in a series of decisions from 1968 to 1971, the CCPA repudiated the mental steps and function of a machine doctrine, reinterpreting § 101 as allowing computer programs within the categories to which Congress intended to extend patent protection. Additionally, the CCPA indicated that the mental-steps doctrine had been reduced to a prohibition on the granting of a patent that would confer a monopoly on all uses of a scientific principle or mathematic equation. Furthermore, the court announced that a computer programmed with a new and unobvious program was physically different from the same computer without that program; the programmed computer was a new machine or at least a new improvement over the unprogrammed computer. Now, a patent could be granted on a new computer program so long as the claims were drafted in apparatus form. In 1970, the CCPA emphasized its rejection of the mental steps doctrine and rejected the PTO’s continued reliance on the “point of novelty” approach to claim analysis under which, if the novelty or advancement in the art claimed by the inventor resided solely in a step of the process embodying a mental operation or other unpatentable element, the claim was rejected under § 101 as being directed to nonstatutory subject matter. The court then announced that any sequence of operational steps was a patentable process under § 101 so long as it was within the “technological arts;” in 1971, this standard was refined in *In re Benson*, 441 F.2d 682 (C.C.P.A. 1971), *rev’d*, *Gottschalk v. Benson*, 409 U.S. 63 (1972), in which the court held that computers, regardless of the uses to which they are put, are within the technological arts for purposes of § 101.

tal-steps doctrine or to the new technological-arts standard” in *Benson*, “the Court clearly held that new mathematical procedures that can be conducted in old computers, like mental processes and abstract intellectual concepts, are not patentable processes within the meaning of § 101.”<sup>106</sup>

The mental process exception mostly lay dormant for the next thirty years, until the CAFC re-kindled it in earnest in 2007 in order to properly consider the patent eligibility of business method patents.<sup>107</sup> In *In re Comiskey*, the court confirmed that under *Benson*, “‘mental processes,’ ‘processes of human thinking,’ and ‘systems that depend for their operation on human intelligence alone’ are not patent-eligible subject matter.”<sup>108</sup> “Following the lead of the Supreme Court, this court and our predecessor court [the CCPA] have refused to find processes patentable when they merely claimed a mental process standing alone and untied to another category of statutory subject matter even when a practical application was claimed.”<sup>109</sup> Therefore, “the application of human intelligence to the solution of practical problems is not in and of itself patentable.”<sup>110</sup>

The next year, in 2008, in *In re Bilski*, the court decided the issue of whether the applicants were “seeking to claim a fundamental principle (such as an abstract idea) or a mental process.”<sup>111</sup> Looking to *Diehr*, the court acknowledged that “while a claim drawn to a fundamental principle is unpatentable, ‘an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection,’” because “the effect of allowing the claim would [not] allow the patentee to pre-empt substantially all uses of that fundamental principle.”<sup>112</sup> Looking to *Benson*, the court noted that “[b]ecause the algorithm [at issue in *Benson*] had no uses other than those that would be covered by the claims (i.e., any conversion of BCD to pure binary on a digital computer), the claims pre-empted all uses of the algorithm and thus they were effectively drawn to the algorithm itself.”<sup>113</sup>

In subsequent decisions, the recitation of mental process was dropped from the specific exclusions from patent eligibility,<sup>114</sup> seemingly under the presumption that a mental process is merely a category of an abstract idea.<sup>115</sup>

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<sup>106</sup> *Diehr*, 450 U.S. at 201 (Stevens, J., dissenting) (citations omitted).

<sup>107</sup> See *In re Comiskey*, 499 F.3d at 1365, 1379 (Fed. Cir. 2007), *vacated*, *In re Comiskey*, 554 F.3d 967 (Fed. Cir. 2009).

<sup>108</sup> *In re Bilski*, 545 F.3d 943, 952 (Fed. Cir. 2008) (citing *In re Comiskey*, 499 F.3d at 1378–79).

<sup>109</sup> *In re Comiskey*, 499 F.3d at 1378.

<sup>110</sup> *Id.* at 1379.

<sup>111</sup> *In re Bilski*, 545 F.3d at 952.

<sup>112</sup> *Id.* at 953.

<sup>113</sup> *Id.* at 954.

<sup>114</sup> *Bilski II*, 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.’”) (citation omitted).

<sup>115</sup> See *In re Bilski*, 545 F.3d at 961. See also *Bilski II*, 130 S. Ct. 3218 (affirming *In re Bilski* under the heading of an abstract idea instead of a mental process). *Accord* *CyberSource Corp. v. Retail*

### B. Post-*Bilski II* Precedent

In *CyberSource Corp.*, its second post-*Bilski II* decision regarding § 101, the CAFC reaffirmed its acknowledgement of the mental process exception in *In re Bilski*, stating that “mental processes are not patent-eligible subject matter because the ‘application of [only] human intelligence to the solution of practical problems is no more than a claim to a fundamental principle.’”<sup>116</sup> The court noted that the mental process exception is not limited to algorithms alone, and can encompass any non-arithmetic steps that “can be performed in the human mind, or by a human using a pen and paper.”<sup>117</sup> Furthermore, “the incidental use of a computer to perform [a] mental process [ ] does not impose a sufficiently meaningful limit on the claim’s scope,” and “does not make the otherwise unpatentable method patent-eligible under § 101.”<sup>118</sup>

The next year, in March 2012, the Supreme Court noted that the patent in *Flook* was held ineligible because in claiming a mathematical formula applied to an otherwise known process, “there was no ‘inventive concept’ in the claimed application of the formula.”<sup>119</sup> In other words, the Court presented the inventive concept requirement to embody the *Flook* rule that post-solution activity that is purely conventional or obvious cannot transform an unpatentable principle into a patentable process. The Court invalidated the patent at issue, which claimed a process of directing a doctor to measure the level of a metabolite, use a law of nature to calculate toxicity limits, and adjust the drug dosage accordingly because “these instructions add nothing specific to the laws of nature other than what is well-understood, routine, conventional activity, previously engaged in by those in the field.”<sup>120</sup> The Court’s inventive concept requirement in the context of a law of nature is equally applicable to the present discussion because mathematical algorithms and laws of nature are conceptually interchangeable and are governed by the same principles.<sup>121</sup>

Four months later, the CAFC decided *Bancorp*, and noted that “a machine, system, medium, or the like may in some cases be equivalent to an abstract mental process for purposes of patent ineligibility.”<sup>122</sup> Furthermore, “the form of the claims

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Decisions, Inc., 654 F.3d 1366, 1371 (Fed. Cir. 2011) (“[A]n unpatentable mental process [is] a subcategory of unpatentable abstract ideas.”).

<sup>116</sup> *CyberSource Corp.*, 654 F.3d at 1371 (quoting *In re Bilski*, 545 F.3d at 965).

<sup>117</sup> *Id.* at 1372 (“Claim 3 does not limit its scope to any particular fraud detection algorithm, and no algorithms are disclosed in the ‘154 patent’s specification. Rather, the broad scope of claim 3 extends to essentially any method of detecting credit card fraud based on information relating past transactions to a particular ‘Internet address,’ even methods that can be performed in the human mind.”).

<sup>118</sup> *Id.* at 1375.

<sup>119</sup> *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1299 (2012).

<sup>120</sup> *Id.*

<sup>121</sup> See *In re Bilski*, 545 F.3d 943, 953 n.6 (Fed. Cir. 2008) (“Mathematical algorithms have, in other cases, been identified instead as abstract ideas rather than laws of nature. Whether either or both views are correct is immaterial since both laws of nature and abstract ideas are unpatentable under § 101.”) (citation omitted).

<sup>122</sup> *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1277 (Fed. Cir. 2012).

should not trump basic issues of patentability.”<sup>123</sup> The court ruled that “[t]o salvage an otherwise patent-ineligible process, a computer must be integral to the claimed invention, facilitating the process in a way that a person making calculations or computations could not,” and “[t]he computer required by some of Bancorp’s claims is employed only for its most basic function, the performance of repetitive calculations, and as such does not impose meaningful limits on the scope of those claims.”<sup>124</sup>

Since *Bancorp*, although no other CAFC majority decision has mentioned either the mental process exception or inventive concept requirement, Judge Mayer has twice dissented based on these concepts,<sup>125</sup> and CLS Bank relied on the inventive concept requirement in its brief to the en banc court.<sup>126</sup>

### C. A Mental Process is the Application of an Abstract Idea and Imposes an Inventive Concept Requirement

A mental process is the application of an abstract idea, and its implementation must be inventive in order to confer patent eligibility under § 101. The CAFC has acknowledged this relationship between an abstract idea and a mental process.<sup>127</sup> In order for the implementation of a mental process to be patentable, it cannot foreclose an entire method that may be performed within the human mind.

Furthermore, restricting the implementation to a computer is not an effective restriction at all, because such devices are essential to the modern and developing digital society and industry, and results in equally broad foreclosure as claiming the essential process itself. The Supreme Court noted that when “[t]he end use may . . . be performed through any existing machinery or future-devised machinery or without any apparatus,” the claim is ineligible.<sup>128</sup> In the modern, digital age, imposing a computer-implemented limitation sequesters the right to perform the claimed method through future-devised machinery, and therefore falls far short of imposing a meaningful limitation. In other words, the practical effect of patenting the mental

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<sup>123</sup> *Id.*

<sup>124</sup> *Id.* at 1278.

<sup>125</sup> *Highmark, Inc. v. Allcare Health Mgmt. Sys., Inc.*, 687 F.3d 1300, 1324 (Fed. Cir. 2012) (Mayer, J., dissenting); *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 41 (Fed. Cir. 2012) (Mayer, J., dissenting).

<sup>126</sup> See Principal en Banc Brief for CLS Bank International and CLS Services Ltd, *CLS Bank Int’l v. Alice Corp. Pty.*, 717 F.3d 1269 (Fed. Cir. 2013) (No. 2011-1301), 2012 WL 6044411, at \*11 (arguing that a patent-eligible method must be implemented through an inventive concept, and that patent eligibility turns on the substance of the claimed invention, not the form in which the claims are drafted).

<sup>127</sup> *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) (“[A] method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101. Methods which can be performed entirely in the human mind are unpatentable not because there is anything wrong with claiming mental method steps as part of a process containing non-mental steps, but rather because computational methods which can be performed *entirely* in the human mind are the types of methods that embody the ‘basic tools of scientific and technological work’ that are free to all men and reserved exclusively to none.”) (footnote omitted).

<sup>128</sup> *Gottschalk v. Benson*, 409 U.S. 63, 68 (1972).

process, even if restricted to implementation by a computer, “would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.”<sup>129</sup> The CAFC summarized the ineffectiveness of restricting implementation of a mental process to a computer in *Bancorp*.<sup>130</sup>

In order to “salvage an otherwise patent-ineligible process, a computer must be integral to the claimed invention, facilitating the process in a way that a person making calculations or computations could not.”<sup>131</sup> In *Bancorp*, the required computer was employed only for its most basic function, the performance of repetitive calculations, and as such did not impose meaningful limits on the scope of those claims.<sup>132</sup> The inventive concept requirement may be satisfied “where, as a practical matter, the use of a computer is required to perform the claimed method.”<sup>133</sup>

For example, in *SiRF Technology, Inc.*, the court found that claims to a “method for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals” recited patent-eligible subject matter.<sup>134</sup> The court noted that it was “not dealing with . . . a method that [could] be performed without a machine” and that there was “no evidence . . . that the calculations here [could] be performed entirely in the human mind.”<sup>135</sup> To the contrary, the court found it was “clear that the methods at issue could not be performed without the use of a GPS receiver.”<sup>136</sup>

Similarly, in *Research Corp. Techs., Inc.*, the court upheld the patentability of a claimed method “for rendering a halftone image of a digital image by comparing, pixel by pixel, the digital image against a blue noise mask.”<sup>137</sup> Because the method required the manipulation of computer data structures (e.g., the pixels of a digital image and a two-dimensional array known as a mask) and the output of a modified

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<sup>129</sup> *Id.* at 72.

<sup>130</sup> *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1277–78 (Fed. Cir. 2012) (“At its most basic, a ‘computer’ is ‘an automatic electronic device for performing mathematical or logical operations.’ As the Supreme Court has explained, ‘[a] digital computer . . . operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand.’ Indeed, prior to the information age, a ‘computer’ was not a machine at all; rather, it was a job title: ‘a person employed to make calculations.’ Those meanings conveniently illustrate the interchangeability of certain mental processes and basic digital computation, and help explain why the use of a computer in an otherwise patent-ineligible process for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes. As we have explained, ‘[s]imply adding a “computer aided” limitation to a claim covering an abstract concept, without more, is insufficient to render the claim patent eligible.’”) (citations omitted).

<sup>131</sup> *Id.* at 1278.

<sup>132</sup> *Id.*

<sup>133</sup> *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1376 (Fed. Cir. 2011).

<sup>134</sup> *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319, 1331 (Fed. Cir. 2010).

<sup>135</sup> *Id.* at 1333.

<sup>136</sup> *Id.* at 1332.

<sup>137</sup> *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010).

computer data structure (a halftoned digital image), the method could not, as a practical matter, be performed entirely in a human's mind.<sup>138</sup>

Therefore, claims withstand the judicially created exclusions from § 101 and are eligible for patent protection when they exhibit an inventive concept, and do not merely accelerate an otherwise mental process.

### V. The Solution Applied to *CLS Bank International En Banc Rehearing*

Within these guidelines, the mental process exclusion and inventive concept requirement handily solve the problems encountered by the court in *CLS Bank International* and answer the questions presented in preparation for its rehearing en banc.<sup>139</sup>

#### A. What test should the court adopt to determine whether a computer-implemented invention is a patent-ineligible abstract idea?

As stated, the court should formally adopt the mental process exclusion to determine whether a computer-implemented invention is ineligible subject matter under § 101. However, the court should avoid adopting a mechanized version of these concepts, as it did with its MoT test. As the Supreme Court has suggested, and the CAFC has acknowledged, formulating a test to be applied mechanically “risk[s] obscuring the larger object of securing patents for valuable inventions without transgressing the public domain.”<sup>140</sup>

Therefore, under the correct legal theory, the court should approach patent eligibility of a computer-implemented claim by first questioning whether or not, if the computer were removed, a human could perform all of the steps of the claim. As stated succinctly by the lower court's decision in *CLS Bank International*, “[i]f someone had thought of this invention 100 years ago, they might have implemented it in a non-electronic manner using various pre-computing tools such as an abacus or handwritten ledgers.”<sup>141</sup> In such a case, the patent merely claims a mental process without an inventive concept, and fails to claim eligible subject matter.

#### B. When, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?

The presence of a computer in a claim should only lend patent eligibility to an otherwise patent-ineligible idea where, as a practical matter, the use of a computer

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<sup>138</sup> *Id.*

<sup>139</sup> See *CLS Bank Int'l v. Alice Corp. Pty.*, 685 F.3d 1341, 1343 (Fed. Cir. 2012), *vacated*, *CLS Bank Int'l v. Alice Corp. Pty.*, 484 F. App'x 559 (Fed. Cir. 2012) (unpublished) (per curium) (questioning the patent eligibility of an invention implemented by computers).

<sup>140</sup> *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1327 (Fed. Cir. 2011), *vacated*, *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012).

<sup>141</sup> *CLS Bank Int'l v. Alice Corp. Pty.*, 768 F. Supp. 2d 221, 242 (D.D.C. 2011), *rev'd*, 685 F.3d 1341 (Fed. Cir. 2012), *vacated*, *CLS Bank Int'l v. Alice Corp. Pty.*, 484 F. App'x 559 (Fed. Cir. 2012) (unpublished) (per curium).

is required to perform the claimed method,<sup>142</sup> like in *SiRF Technology, Inc. and Research Corp.*<sup>143</sup>

However, this question should not be read to beg an answer that “misses the point,” as the CAFC did in *CLS Bank International* and as Bancorp did in *Bancorp*.

In *CLS Bank International*, the court found that “[t]he asserted claims appear to cover the practical application of a business concept in a specific way, which requires computer implemented steps of exchanging obligations,”<sup>144</sup> stated differently, that solely because the claims required computer implementation of the mental process, the computer was required to perform the claimed method.

The court in *Bancorp* implicitly acknowledged *CLS Bank International*’s non sequitor, noting that

Bancorp seeks to analogize its case to *SiRF*, contending that a computer ‘plays a significant part’ in its claims because they require ‘precise and repetitive calculation.’ That misses the point. It is the management of the life insurance policy that is ‘integral to each of [Bancorp’s] claims at issue,’ not the computer machinery that may be used to accomplish it.<sup>145</sup>

Furthermore, “[u]sing a computer to accelerate an ineligible mental process does not make that process patent-eligible.”<sup>146</sup>

That is, just because the claim requires a computer to implement the process, or just because the mental process is so complex that a data processing machine is necessary to perform the calculation quickly or efficiently, the computer’s presence within the claim does not mean that the computer is “required to perform the claimed method” for the purposes of patent eligibility.

C. In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium?; Should such claims at times be considered equivalent for § 101 purposes?

For the purpose of § 101 eligibility, it should not matter how the invention is claimed, and all methods of claiming the same invention should be considered equivalents. Indeed, the concept that patentable subject matter under § 101 is not “like a nose of wax which may be turned and twisted in any direction” is over a century old.<sup>147</sup>

It has long been settled that regardless of what statutory category (“process, machine, manufacture, or composition of matter”<sup>148</sup>) a claim’s language is crafted to

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<sup>142</sup> *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1376 (Fed. Cir. 2011).

<sup>143</sup> See *supra* Part III. C (arguing that patent eligibility should be limited to the claims where the process cannot be performed without the use of a computer).

<sup>144</sup> *CLS Bank Int’l*, 685 F.3d at 1355.

<sup>145</sup> *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1279 (Fed. Cir. 2012).

<sup>146</sup> *Id.*

<sup>147</sup> *Parker v. Flook*, 437 U.S. 584, 590 (1978) (citing *White v. Dunbar*, 119 U.S. 47, 51 (1886)).

<sup>148</sup> 35 U.S.C. § 101 (2006).

literally invoke, the court looks to the underlying invention for patent-eligibility purposes.<sup>149</sup> The President's Commission on the Patent System so acknowledged in 1966, suggesting to the PTO that "[i]ndirect attempts to obtain patents and avoid the rejection, by drafting claims as a process, or a machine or components thereof programmed in a given manner, rather than as a program itself, have confused the issue further and should not be permitted."<sup>150</sup>

For example, in *CyberSource*, the CAFC addressed the issue of a "Beauregard claim," a claim to a computer readable medium (e.g., a disk, hard drive, or other data storage device) containing program instructions for a computer to perform a particular process.<sup>151</sup> *CyberSource* argued that its Beauregard claim was patent-eligible per se because it recites a "manufacture," rather than a "process," under the statutory language of § 101.<sup>152</sup> The Beauregard claim at issue recited nothing more than a computer-readable medium containing program instructions for executing the method claim at issue.<sup>153</sup> The court found the method claim to be unpatentable because it is drawn to a mental process, that is, because "one could mentally perform the fraud detection method that underlies" both claims, the claims attempted to capture unpatentable mental processes and were invalid under § 101.<sup>154</sup>

As the CAFC stated in *Bancorp*, a machine, system, medium, or the like may in some cases be equivalent to an abstract mental process for purposes of patent eligibility.<sup>155</sup> The form of the claims should not trump basic issues of patentability.<sup>156</sup> The guiding principle, therefore, is that regardless of the form of the claim, purely mental processes are unpatentable, even when performed by a computer.<sup>157</sup>

## VI. Conclusion

A study of the relevant Supreme Court, CAFC, and CCPA case law reveals that current precedent dictates the exclusion of mental processes from patent eligibility, and demands an inventive concept in the implementation of a mental process to a tangible real world problem.

Claims that are implemented using some sort of electronic processing device should be eligible for patent protection only if the patent is essentially on the electronic device itself, as opposed to essentially on the process itself, using the processing device incidentally to perform calculations or comparisons or any activity that could otherwise be contemplated without the presence of the device. To illus-

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<sup>149</sup> See *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1374 (Fed. Cir. 2011).

<sup>150</sup> *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972).

<sup>151</sup> *CyberSource*, 654 F.3d at 1373.

<sup>152</sup> *Id.* at 1374.

<sup>153</sup> *Id.*

<sup>154</sup> *Id.* at 1376–77.

<sup>155</sup> *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1277 (Fed. Cir. 2012).

<sup>156</sup> *Id.*

<sup>157</sup> See *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (explaining a method of programming a general-purpose computer to convert BCD numerals to pure binary numerals which was unpatentable because the conversion "can be done mentally").

trate, many patents have properly issued on devices commonly known as calculators,<sup>158</sup> but a patent claiming a method of using a calculator to perform arithmetic is not qualifying subject matter under § 101.

Acknowledgement of the mental process exclusion from patentable subject matter would enable the CAFC to adjudicate the questions it presented for briefing after granting its en banc rehearing in *CLS Bank International* without introducing another reductionist, mechanical test, of the kind that the Supreme Court has specifically cautioned against. Indeed, the Supreme Court has essentially asked the CAFC to acknowledge as much, inviting the CAFC “to defin[e] a narrower category or class of patent applications . . . and then rule that the category is unpatentable because, for instance, it represents an attempt to patent abstract ideas,” because “this conclusion might well be in accord with controlling precedent.”<sup>159</sup>

Regarding computer-implemented claims under the mental process exception and its corollary, the inventive concept requirement, the Federal Circuit’s rehearing of *CLS Bank International* is its chance to do just that.

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<sup>158</sup> See, e.g., U.S. Patent No. 2,668,661 (filed Nov. 23, 1944 ); U.S. Patent No. 4,001,566 (filed Oct. 29, 1973); U.S. Patent No. 5,623,433 (filed Mar. 11, 1993).

<sup>159</sup> *Bilski II*, 130 S. Ct. at 3229.

