PATENT LAW — PATENTABLE SUBJECT MATTER — FEDERAL CIRCUIT HOLDS THAT MENTAL PROCESSES THAT DO NOT, AS A PRACTICAL MATTER, REQUIRE A COMPUTER TO BE PERFORMED ARE UNPATENTABLE. — *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011).

That courts have struggled to articulate a clear test for determining the patentability of processes is an understatement. The Supreme Court and the Court of Appeals for the Federal Circuit alike have experimented with various formulations,[1] which have typically been as colorful as they are confusing. Recently, in *CyberSource Corp. v. Retail Decisions, Inc.*,[2] the Federal Circuit held that a method and system for detecting fraud in credit card transactions conducted over the internet was not patentable subject matter as required by § 101 of the Patent Act.[3] In doing so, the Federal Circuit created and applied a test that based patentability on whether a computer is required, as a practical matter, to perform a process.[4] Structurally, the test's rigidity may contravene the Supreme Court's instruction to formulate a more flexible test. Substantively, the test's fundamental inquiry — determining complexity as a function of computing power — likely fails to further the goals of the patent system.

CyberSource Corporation owns U.S. Patent No. 6,029,154 (the '154 patent), which claims a method and system for detecting fraud in credit card transactions occurring over the internet between consumer and merchant.[5] Allegedly, the patent is especially useful for verifying the identities of purchasers of downloadable content, for whom traditional methods of fraud detection — which generally rely on billing addresses and personal identification information — are often inadequate.[6] The '154 patent corroborates the internet information (such as IP addresses, MAC addresses, and email addresses) of the instant purchase with internet information associated with previous purchases made by the same card.[7] Two claims of the '154 patent were at issue:

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[1] *See, e.g.*, *In re* Bilski, 545 F.3d 943, 959 (Fed. Cir. 2008) (en banc) (displacing all prior tests with the "machine-or-transformation" test); *id.* at 950 (mentioning the "technological arts" test); AT&T Corp. v. Excel Commc'ns, Inc., 172 F.3d 1352, 1358 (Fed. Cir. 1999) (applying the "useful, concrete, and tangible" test); State St. Bank & Trust Co. v. Signature Fin. Grp., 149 F.3d 1368, 1374 (Fed. Cir. 1998) (abrogating the "*Freeman-Walter-Abele*" test).

[2] 654 F.3d 1366 (Fed. Cir. 2011).

[3] 35 U.S.C. §§ 1–376 (2006); *see Cybersource*, 654 F.3d at 1376–77 (citing 35 U.S.C. § 101).

[4] *See Cybersource*, 654 F.3d at 1376.

[5] *Id.* at 1367.

[6] *Id.* at 1367–68.

[7] *Id.* The patent "obtain[s] information" about other credit card transactions that used the same internet address, "construct[s] a map of credit card numbers based upon [those] transactions," and "utilize[s] the map . . . to determine if the credit card transaction is valid." *Id.* at 1370.

Claim 3, which recites the *process* of verification, and Claim 2, which recites a *computer-readable medium* (such as a disk or hard drive) containing program instructions for executing that same process.[8] On August 11, 2004, CyberSource sued Retail Decisions, Inc. in the Northern District of California for allegedly infringing the patent.[9] Retail Decisions moved for summary judgment, arguing the patent was invalid under 35 U.S.C. § 101,[10] which establishes the exclusive categories of patentable subject matter: "process, machine, manufacture, or composition of matter."[11]

The trial court granted summary judgment of invalidity on both Claims 2 and 3.[12] Judge Patel analyzed whether these claims were patentable "processes" by applying the "machine-or-transformation" test.[13] Under this test, a process is patentable if: "(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing."[14] The court concluded the patent's claims failed to meet either prong of the test.[15]

The Federal Circuit Court of Appeals affirmed unanimously upon de novo review.[16] Writing for the panel, Judge Dyk underscored as a preliminary matter that pursuant to the Supreme Court's decision in *Bilski v. Kappos*,[17] the machine-or-transformation test is "not the sole test" for determining the patentability of processes, though it is still a "useful and important clue."[18] Accordingly, the court asserted that it was free to develop "other limiting criteria that further the purposes of the Patent Act and are not inconsistent with its text."[19]

The Federal Circuit similarly found that the '154 patent's claims failed both prongs of the machine-or-transformation test. The court

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[8] *Id.* at 1369.

[9] *Id.*

[10] *Id.* at 1368.

[11] 35 U.S.C. § 101 (2006). The Federal Circuit noted that § 100(b) of the Patent Act defines the "process" category "tautologically," *CyberSource*, 654 F.3d at 1369, to mean "process, art or method, and . . . a new use of a known process, machine, manufacture, composition of matter, or material," 35 U.S.C. § 100(b).

[12] CyberSource Corp. v. Retail Decisions, Inc., 620 F. Supp. 2d 1068, 1081 (N.D. Cal. 2009).

[13] *See id.* at 1072–78. The Federal Circuit established the machine-or-transformation test as the exclusive means of making such determinations in *In re Bilski*, 545 F.3d 943, 959 (Fed. Cir. 2008) (en banc), but on appeal the Supreme Court held it could not be the "sole test," Bilski v. Kappos, 130 S. Ct. 3218, 3226 (2010).

[14] *CyberSource*, 620 F. Supp. 2d at 1072 (quoting *Bilski*, 545 F.3d at 954). In addition, a process that meets this test is nonetheless unpatentable if the machine or transformation is extraneous to the solution. *See id.* This additional requirement weeds out claims that attempt to meet the machine-or-transformation test through, for example, clever draftsmanship.

[15] *Id.* at 1078.

[16] *CyberSource*, 654 F. 3d at 1369.

[17] 130 S. Ct. 3218.

[18] *CyberSource*, 654 F. 3d at 1369 (quoting *Bilski*, 130 S. Ct. at 3227).

[19] *Id.* at 1370 (quoting *Bilski*, 130 S. Ct. at 3231).

found that Claim 3 (recitation of the *method*) failed the test because "[t]he mere collection and organization of data" is not transformative and does not require a particular machine — or any machine, for that matter — to be performed.[20] Moreover, the internet could not be considered a machine because it is merely the source of the data and cannot itself perform the fraud detection steps.[21] Noting, however, that the machine-or-transformation test is not dispositive, the court then assessed the patentability of Claim 3 upon other legal grounds. In choosing which other grounds to consider, the court focused on the Supreme Court's language in *Gottschalk v. Benson*,[22] namely, that "[p]henomena of nature . . . , *mental processes*, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work."[23] Such basic tools, the Federal Circuit asserted, are "free to all men and reserved exclusively to none."[24] In *Benson*, the Supreme Court found that a number-conversion method using a mathematical algorithm was not patentable because the conversion "can be done mentally" and "without a computer."[25] From this, the Federal Circuit gathered that the Supreme Court "appeared to endorse the view that methods which can be performed mentally, or which are the equivalent of human mental work, are unpatentable abstract ideas — the 'basic tools of scientific and technological work' that are open to all."[26] Then, the Federal Circuit emphasized the Supreme Court's observation in *Parker v. Flook*[27] — another case where the Court invalidated a method patent[28] — that the calculations at issue could "be made [using a] pencil and paper."[29] Finally, the Federal Circuit pointed to its own prior holding in *In re Bilski*[30] that the "application of [only] human intelligence to the solution of practical problems is no more than a claim to a fundamental principle."[31] Synthesizing these legal decrees, the court concluded that Claim 3 was an unpatentable mental process

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[20] *Id.* at 1370.

[21] *Id.*

[22] 409 U.S. 63 (1972).

[23] *CyberSource*, 654 F.3d at 1371 (alteration in original) (quoting *Benson*, 409 U.S. at 67 (emphasis added)) (internal quotation marks omitted).

[24] *Id.* at 1373.

[25] *Id.* at 1371 (quoting *Benson*, 409 U.S. at 67).

[26] *Id.* (quoting *Benson*, 409 U.S. at 67).

[27] 437 U.S. 584 (1978).

[28] *Id.* at 595–96. The patent in *Flook* claimed a method for calculating the values of "alarm limits," which, if exceeded, would trigger an alarm to sound. *Id.* at 585–86.

[29] *CyberSource*, 654 F.3d at 1371 (alteration in original) (quoting *Flook*, 437 U.S. at 586).

[30] 545 F.3d 943 (Fed. Cir. 2008) (en banc).

[31] *CyberSource*, 654 F.3d at 1371 (alteration in original) (quoting *In re* Bilski, 545 F.3d 943, 965 (Fed. Cir. 2008) (en banc)) (internal quotation marks omitted).

because "[a]ll of [its] method steps can be performed in the human mind, or by a human using a pen and paper."[32]

Next, the court addressed Claim 2 (the recitation of a *computer-readable medium* containing instructions for executing the process's steps, a type of claim often referred to as a "Beauregard claim"[33]), which it found similarly unpatentable because "[t]he method underlying claim 2 is clearly the same method of fraud detection recited in claim 3."[34] Thus, finding the "Beauregard claim format"[35] of Claim 2 to be irrelevant, the court treated it just like a process claim, explaining that simply drawing a process claim to a computer does not automatically make it patentable;[36] the computer must be *required*.[37] The court contrasted CyberSource's claims, which it found did not require a computer to be performed, with other process claims that the court held to be patentable because they "required" the use of a computer.[38]

The Federal Circuit's test may be summed up as follows: drawing a process to a computer does not make it patentable if that process can, as a practical matter, be completed without a computer.[39] The test signals the Federal Circuit's serious deliberation over how to craft a patentability test for process claims that follows Supreme Court precedent and is fit for the modern world. But the test presents two major concerns: First, it is a bright-line rule and therefore may contravene the Supreme Court's direction in *Bilski* that the Federal Circuit create a less formalistic, more flexible, and more holistic test for determining the patentability of processes.[40] Second, the test's connection to the purposes of the patent system — here, specifically, prevent-

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[32] *Id.* at 1372. One could perform the first step, "obtaining information about other transactions," by "simply read[ing] records of Internet credit card transactions"; one may perform the second step, "construct[ing] a map of credit card numbers," by "writing down a list of credit card transactions"; and one may perform the third step, "utilizing the map of credit card numbers to determine if the credit card transaction is valid," "entirely in the . . . mind." *Id.* at 1372–73.

[33] A "*Beauregard* claim" is a claim to a computer-readable medium that contains program instructions for a computer to perform a particular process. *Id.* at 1373. The term originated from *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995).

[34] *CyberSource*, 654 F.3d at 1374.

[35] *Id.* at 1375.

[36] *See id.*

[37] *See id.*

[38] *See id.* at 1376.

[39] The test's relationship to the machine-or-transformation test is unclear. The court does not delve into whether the "is a computer required" test is to be a complete substitute for the machine-or-transformation test or whether its application is limited to mental process claims (which are a subset of abstract claims). In addition, turning to a categorical exclusion seems unresponsive to the *Bilski* Court's command that machine-or-transformation not be the sole test. *See* Bilski v. Kappos, 130 S. Ct. 3218, 3227 (2010). Indeed, it is unclear why the court proceeded with the machine-or-transformation analysis at all. Finding that the claim constituted a mental process confirmed the court's finding that the claim was not a machine or transformation, but a finding to the contrary would have not saved the claim.

[40] *See id.*

ing appropriation of "basic tools" while granting rightful protection to inventions to encourage innovation — is tenuous.

Asking whether a computer is required for a process seeking patent protection is a means of categorical exclusion. This is problematic because the Supreme Court has criticized rigid, bright-line rules for determining patentability of processes.[41] In *Bilski*, the Federal Circuit had decided that the machine-or-transformation test would be the sole determinant of patentability[42] and intended for the test to establish, premised on a (much-criticized) notion of physicality,[43] "a bright line delineation between patentable subject matter and the recognized categories of excluded matter."[44] Upon review, the Supreme Court affirmed the Federal Circuit's judgment but rejected the machine-or-transformation analysis as the exclusive test of patentability of processes.[45] The Court disapproved of the Federal Circuit's reduction of the patent-eligibility analysis to an inflexible, exclusive, and categorical test[46] and warned it not to read into the Patent Act limitations the Act did not contain.[47]

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[41] *See, e.g.*, Parker v. Flook, 437 U.S. 584, 590 (1978) (impugning categorical exceptions to patentability for "exalt[ing] form over substance"). Scholars have similarly criticized the use of — and in particular the Federal Circuit's preference for — rules over standards in patent doctrine because categorical exclusions often overlook "technological fact," Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1037 (2003), and risk being "overinclusive," Recent Case, Patentable Subject Matter — Federal Circuit Invalidates Diagnostic Method Claims as Drawn to "Abstract Mental Processes." — Association for Molecular Pathology v. U.S. Patent & Trademark Office, 125 HARV. L. REV. 658, 665 n.65 (2011) (discussing diagnostic method patentability).

[42] *In re* Bilski, 545 F.3d 943, 959–61 (Fed. Cir. 2008) (en banc).

[43] *See id.* at 1015 (Rader, J., dissenting) ("Today's software transforms our lives without physical anchors. This court's test . . . risks hobbling these advances . . . ."); Stefania Fusco, *Is* In re Bilski *a Déjà Vu?*, 2009 STAN. TECH. L. REV. 1, ¶¶ 4–5, 7–8; Ben McEniery, *Physicality and the Information Age: A Normative Perspective on the Patent Eligibility of Non-Physical Methods*, 10 CHI.-KENT J. INTELL. PROP. 106, 115 (2011).

[44] McEniery, *supra* note 43, at 115. *But see* R. David Donoghue & Michael A. Grill, In re Bilski: *A Midpoint in the Evolution of Business Method Patents?*, 7 NW. J. TECH. & INTELL. PROP. 316, 330 (2009) ("*Bilski* does not draw a bright line for process patentability, . . . yet the exclusionary incentive seemingly remains for processes that require it.").

[45] *Bilski*, 130 S. Ct. at 3226.

[46] *See id.* at 3227 ("A categorical rule denying patent protection . . . would frustrate the purposes of the patent law." (quoting Diamond v. Chakrabarty, 447 U.S. 303, 315 (1980)) (internal quotation mark omitted)); *see also* Mark A. Lemley et al., *Life After* Bilski, 63 STAN. L. REV. 1315, 1316 (2011); Dave Syrowik, *Bridging the Gap Between the Abstract and Real Worlds of Patent Eligibility Using the "Guideposts" of* Bilski, MICH. B.J., July 2011, at 27, 28; *cf.* Peter Lee, *Patent Law and the Two Cultures*, 120 YALE L.J. 2, 27, 62 (2010) (noting that "Federal Circuit patent doctrine is highly formalistic," *id.* at 27, whereas the Supreme Court has "recent[ly] . . . consistently favored holistic standards over formalistic rules," *id.* at 62).

[47] *See Bilski*, 130 S. Ct. at 3226 (asserting that restricting the definition of "process" in § 100(b) of the Patent Act to processes involving machines or other physical instruments is not consistent with any "ordinary, contemporary, common meaning" of the statutory definition (quoting Diamond v. Diehr, 450 U.S. 175, 182 (1981)) (internal quotation marks omitted)).

One might argue that *CyberSource*'s additional inquiry into whether a computer is "practically" required appears fact sensitive. While this language may signify the Federal Circuit's attempt to soften the exclusivity of the computer requirement, the attempt was unsuccessful because assessing "practicality" requires an opaque and unprincipled analysis. To illustrate the demarcation between methods that practically require a computer to be performed and methods that do not, the court compared CyberSource's claims with two other patents that it had deemed patentable due to their practical requirement of a computer: the calculation of the position of a GPS receiver[48] and the creation of halftone images through pixel-by-pixel scrutinization of digital images.[49] But it is not at all obvious why it is *not* "practical" to perform the aforementioned methods entirely in the human mind (or by pencil and paper) but *is* practical to obtain IP and MAC information of online content purchasers, generate a map of this information, and deduce from cross-comparisons the likelihood of credit card fraud. Inserting a "practicality" requirement does not automatically transform a rule into a cogent standard; rather, the test remains a rule, and a confusing one by virtue of its status as a rule but its dependence on ill-defined subjectivity.

A second problem with *CyberSource*'s test is that its fundamental inquiry — whether a process is complex enough to require a computer — overlooks the patent system's policy goals. As the Constitution provides, the system exists to "promote the Progress of Science and useful Arts."[50] In practical terms, this means maintaining a "balance between the need to encourage innovation and the avoidance of monopolies"[51] — the incentive to innovate would be small if inventors were denied protection for what they invent, but overprotection hinders future innovation.[52] Accordingly, some ideas should always be open for all to use; these "are *fundamental*, the building blocks of human thought,"[53] which are "too important to be owned by anyone."[54] The court wanted to prevent private monopolization of these "building blocks," explaining that "methods which can be performed *entirely* in the human mind are the types of methods that embody the 'basic tools

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[48] *See CyberSource*, 654 F.3d at 1376 (citing SiRF Tech., Inc. v. Int'l Trade Comm'n, 601 F.3d 1319, 1331–33 (Fed. Cir. 2010)).

[49] *See id.* (citing Research Corp. Techs. v. Microsoft Corp., 627 F.3d 859, 868 (Fed. Cir. 2010)).

[50] U.S. CONST. art. I, § 8, cl. 8.

[51] McEniery, *supra* note 43, at 110; *see also* Andrew Beckerman-Rodau, *The Problem with Intellectual Property Rights: Subject Matter Expansion*, 13 YALE J.L. & TECH. 35, 39 (2010); Lemley et al., *supra* note 46, at 1328.

[52] *See* Lemley et al., *supra* note 46, at 1328; *see also* Efthimios Parasidis, *A Uniform Framework for Patent Eligibility*, 85 TUL. L. REV. 323, 335 (2010).

[53] Lemley et al., *supra* note 46, at 1328.

[54] Beckerman-Rodau, *supra* note 51, at 59.

of scientific and technological work' that are free to all men and re- served exclusively to none."[55] The court's actual concern, then, was not that an inventor would control a discrete *application* of a "building block" but that he would obtain rights over the "building block" it- self[56] — in other words, that the claim was too broad.[57] Thus the court's reasoning in crafting the "is a computer required" test must have been that, if a process is complex enough to require a computer,[58] then it is not so broad that it claims a fundamental principle.

As such, the test presents two concerns. First, using "complexity" to measure the breadth of a claimed process is arbitrary. The patent statute nowhere mentions "complexity" as a prerequisite for patentabil- ity. No other type of invention's patentability is predicated on its (al- leged) complexity. Second, "complexity" is too imprecise to be adopted as a standard. This problem is demonstrated by the court's struggle to articulate exactly what degree of "complexity" is required for patenta- bility in its very next decision dealing with a method patent, *Ultramer- cial, LLC v. Hulu, LLC*,[59] decided just a few weeks after *CyberSource*. After listing the steps of Ultramercial's claimed process, the court de- clared merely that "[m]any of [the] steps are likely to require intricate and complex computer programming" without offering further expla- nation.[60] In fact, though it stressed the program's complexity,[61] it did not try to "define the level of programming complexity required before a computer-implemented method can be patent-eligible," but "simply [found] the claims [t]here to be patent-eligible."[62] And finally, while the court recognized *Ultramercial*'s tension with *CyberSource*, its at- tempt to distinguish the two seemed forced.[63]

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[55] *CyberSource*, 654 F.3d at 1373 (quoting Gottschalk v. Benson, 409 U.S. 63, 67 (1972)).

[56] *See* Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc., 548 U.S. 124, 127–28 (2006) (Breyer, J., dissenting from dismissal of certiorari) (articulating the "basic judgment" that permit- ting patenting of "fundamental scientific principles" would "severely interfere with, or discourage, development and the further spread of useful knowledge itself").

[57] The court raised concerns about CyberSource's claims' broadness consistently throughout the decision. *See CyberSource*, 654 F.3d at 1368, 1370, 1372, 1373.

[58] The *CyberSource* opinion did not explicitly state that "complexity" was what animated the "is a computer required" inquiry, but one would be hard-pressed to generate another plausible alternative. Indeed, the court's very next decision on the patentability of mental processes, *Ul- tramercial, LLC v. Hulu, LLC*, 657 F.3d 1323 (Fed. Cir. 2011), confirmed that "complexity" was what it had in mind in *CyberSource*. *See id.* at 1328.

[59] 657 F.3d 1323 (Fed. Cir. 2011). The claim at issue in *Ultramercial* was a "method for dis- tributing 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 adver- tiser pays for the copyrighted content." *Id.* at 1324.

[60] *Id.* at 1328.

[61] *See id.*

[62] *Id.*

[63] The court declared that, unlike the claims in *Ultramercial*, CyberSource's claims were an instance of "*purely* mental steps," which is a "particularly narrow" exclusion. *Id.* at 1329–30.

Even if "complexity" is the correct or best available inquiry, using the alleged or claimed necessity of a computer to measure complexity is out of touch with modernity. The court's imposition of a computer-necessity requirement suggests it equated "complexity" with "computing power," as opposed to, say, intelligence.[64] Computing power is irrelevant to inventiveness, especially given the rapidly changing nature of technology[65] and the patent system's underlying focus on efficiency.[66] In fact, computing power and inventiveness are in opposition. A program requiring 500 steps to execute is arguably *less* patent worthy than a program requiring five to do the same thing. Thus a computing-power requirement creates an artificial distinction between programs of possibly equal inventiveness, a distinction that may upend parity between the inventor's practical contribution and the protection he should receive in return. Indeed, emphasis on computing power might even slow innovation.[67] Moreover, it may encourage manipulative drafting of claims[68] or force an artificial reliance on "magic words"[69] in claim language.

The doctrine surrounding patentability of processes is in tumult. Confusion stems from the paucity of guidance courts have provided about *why* they created a given test and *how* the test promotes the patent system's goals.[70] Continuing the trend of rigid adherence to formalism will only compound confusion;[71] instead, the Federal Circuit should demystify the test's contours through explicit and sound mooring to policy rather than by repetition of rhetoric.

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[64] Computers are not intelligent. *See generally* John R. Searle, *Minds, Brains, and Programs*, 3 BEHAV. & BRAIN SCI. 417 (1980). Rather, their value lies in the capability to process rapidly a large number of iterations that may have many and large inputs. In addition, premising patentability on computing power approaches a "machine" requirement, which would simply reinstitute the machine prong of the recently relegated machine-or-transformation test.

[65] *Cf.* McEniery, *supra* note 43, at 129 (noting that the present "information-based economy" requires recasting of patentability tests so they do not "confine[] the scope of patentable subject matter to manufacturing technologies of the past").

[66] *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 276 (1977).

[67] *See, e.g.*, *In re* Bilski, 545 F.3d 943, 1015 (Fed. Cir. 2008) (Rader, J., dissenting) ("Innovation has moved beyond the brick and mortar world. . . . If this court has its way, the Patent Act may not incentivize, but complicate, our search for the vast secrets of nature.").

[68] In *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057 (Fed. Cir. 2011), Chief Judge Rader acknowledged this problem of "claim drafting evasion," whereby claimants may attempt to "circumvent eligibility restrictions." *Id.* at 1074 (Rader, C.J., additional views). Inventors may write claims more esoterically to feign complexity or devise ways to nominally tie their methods to computers.

[69] Fusco, *supra* note 43, ¶ 8.

[70] *See, e.g.*, Peter S. Menell, *Forty Years of Wondering in the Wilderness and No Closer to the Promised Land:* Bilski*'s Superficial Textualism and the Missed Opportunity to Return Patent Law to Its Technology Mooring*, 63 STAN. L. REV. 1289, 1291–92 (2011).

[71] *Id.* at 1291.