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THE 101 CONUNDRUM: CREATING A FRAMEWORK TO SOLVE PROBLEMS SURROUNDING INTERPRETATION OF 35 U.S.C. § 101

ROBERT MAZZOLA*

INTRODUCTION

Section 101 cases are a particularly vexing subject for practicing patent attorneys, and are the subject of much contention and debate.¹ In an effort to quell assertions of expansive, questionable patents, the Supreme Court has, in a series of landmark decisions, broadened the judicially created exclusions from patentable subject matter: abstract ideas, laws of nature, and naturally occurring substances.² These recent efforts have spawned a “101 Conundrum,” in which courts struggle both to delineate the breadth of these categorical exclusions and preserve the integrity of the patent system. The Supreme Court has neglected to define these categories,³ and has rejected the Court of Appeals for the Federal Circuit’s (“CAFC”) attempt to provide bright-line clarity.⁴ With due respect, the Supreme Court’s § 101 jurisprudence is replete with inconsistencies and fails to provide practicing attorneys and judges with adequate guidance. Without guiding principles for adjudging patentable subject matter, judges and examiners may inject their personal views into deciding which patent claims⁵ merit protec-

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1. A § 101 case is one where the validity of a patent is adjudicated under 35 U.S.C. § 101 (2012), which reads: “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” The Supreme Court has articulated that § 101 explicitly sets forth four categories of patentable subject matter: processes, machines, articles of manufacture and compositions of matter. *Bilski v. Kappos*, 561 U.S. 593, 601 (2010).

2. *See id.*, *see also* *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013) (“The three categories of patent ineligible subject matter are non-statutory “implicit exception[s]” to the patent laws.”).

3. *See Bilski*, 561 U.S. at 612 (“The Court, therefore, need not define further what constitutes a patentable ‘process’”); *see also* *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2357 (2014) (“In any event, we need not labor to delimit the precise contours of the ‘abstract ideas’ category in this case.”)

4. *See Bilski*, 561 U.S. at 612–13 (rejecting machine-or-transformation test).

5. Claims are the essence of the patent, because they are the part of the patent where an applicant attempts to define the scope of the legal monopoly granted by a patent. *See* MPEP § 2171 (9th ed. Mar. 2014). In every patent, a patentee must include one or more claims to define

tion and control the deciding factor, i.e., whether an invention is within an ineligible category, regardless of the patent's effect on promoting the useful arts.⁶

There is an answer to resolving this uncertainty, however. The key to unlocking the Court's reasoning regarding patentable subject matter can be found in an exchange between Justice Kennedy and counsel for petitioners during oral argument in the most recent case regarding patentable subject matter, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*⁷ During oral argument, Counsel effectively conceded that the patent at issue "would be fairly easy to program," and could be implemented in a "weekend" by "any computer group of people sitting around a coffee shop in Silicon Valley."⁸ While these qualitative factors of time, effort, and expertise were not explicitly present in the opinion, it is clear that the dialogue during oral argument informed the Court's opinion that the patent at issue was merely a "generic implementation."⁹ In other words, the idea underlying the patent itself was something that could be implemented by a person of ordinary skill in the art fairly easily. This exchange helps one understand that the generic implementation standard articulated by the Court can be restated to require that the idea underlying a patent must be more than simply *self-enabling*.

This Article describes the concept of self-enablement and explains how it is a construct that has been underpinning the Court's logic in other cases regarding patentable subject matter preceding *Alice*. Essentially, the self-enablement doctrine involves an inquiry into whether the invention as a whole could be implemented by a person of ordinary skill in the art ("POSITA") using well known and conventional techniques, *without undue experimentation*. I add the language "undue

what the patentee has the right to exclude others from making, using, or selling. Each claim is numbered, and includes one or more clauses, separated by semi-colons, called limitations.

6. The Constitution provides Congress with the power to "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. . ." U.S. CONST. art. I, § 8, cl. 8. This provision provides for promoting "science" by granting protection for "writings" via Copyright, and promoting "useful Arts" for "Discoveries" via Patent. Thus, in enacting laws that enable patent protection, Congress has acted to promote the "useful Arts" rather than "science." See *In re Bergy*, 596 F.2d 952, 958 (C.C.P.A. 1979), *aff'd sub. nom.* *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980).

7. 134 S. Ct. at 2355.

8. Transcript of Oral Argument at 5, 12, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) (No. 13-298).

9. See *Alice*, 134 S. Ct. at 2359 ("the relevant question is whether the claims here do more than simply instruct the practitioner to implement the abstract idea of intermediated settlement on a *generic* computer. . . . In short, each step does no more than require a *generic* computer to perform *generic* computer functions. . . . Viewed as a whole, petitioner's method claims simply recite the concept of intermediated settlement as performed by a *generic* computer.") (emphasis added).

experimentation” to the Court’s articulation of the standard in order to borrow the qualitative aspect of the enablement doctrine under § 112.¹⁰ Referencing undue experimentation brings a wealth of robust case law, and offers the promise of bringing coherence to an area that has frustrated many across time. This Article explains the history of cases adjudicated under §101, and outlines how self-enablement is the concept that the Court has struggled to articulate in defining patentable subject matter.

The framework in this Article takes into account underlying considerations of the Supreme Court in determining whether a patent is simply an “abstract idea,” “natural law,” or “naturally occurring substance.” One advantage of developing a framework in this fashion is that it obviates the need for a legislative remedy because it directly applies language from Supreme Court decisions to create a test for patentability that replaces the current framework.

This Article unfolds as follows. Part II explains the current standard for adjudging patentable subject matter as articulated in the latest § 101 cases. It also gives a brief introduction to the uncertainty created by recent precedent, including a hypothetical application of the current framework, which reveals a puzzling result based on a recent district court case, *McRO, Inc. v. Activision Publ., Inc.*¹¹ In *McRO*, the claimed invention at issue was found to be paradoxically “tangible,” yet “abstract.”¹² Part III provides two pieces of historical background. The first, in Part III(A), draws parallels between the Court’s current § 101 jurisprudence and the Court’s jurisprudence prior to the enactment of § 103.¹³ This section explains how courts are showing signs of repeat-

10. 35 U.S.C. § 112 contains several requirements, including, *inter alia*, written description, enablement, and particularity. Each specification must contain a written description. In *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.* 598 F.3d 1336, 1345 (Fed. Cir. 2010) (en banc), the CAFC held that the written description requirement is a separate requirement from enablement in § 112. A satisfactory written description contains precise definitions of a claimed genus such that a POSITA can recognize all members of the genus. *Id.* at 1350 (citations omitted). Enablement requires that each specification must also sufficiently describe the invention in such detail that it enables a POSITA to make and use the invention without undue experimentation. In *re Wright*, 999 F.2d 1557, 1561 (citation omitted). Conversely if a POSITA could not make or use the invention without undue experimentation, the claimed invention is not enabled. *Id.* Particularity requires that claims must point out and distinctly claim the subject matter of the invention. See *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (“A patent is invalid for indefiniteness if its claims, read in light of the patent’s specification and prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”).

11. See *McRO, Inc. v. Activision Publ., Inc.*, No. 14-CV-336-GW(FFMx), 2014 U.S. Dist. LEXIS 135152, at *25–26 (C.D. Cal. Sept. 22, 2014).

12. *Id.*

13. 35 U.S.C. § 103 (non-obviousness): prevents patentees from claiming inventions that could be created by making modifications to prior art without any degree of skill or ingenuity. Specifically, § 103 precludes patentability when the differences between a claimed invention and

ing the capricious decision-making that preceded the enactment of the 1952 Patent Act through the use of the “inventive application” requirement under § 101. The second background, in Part III(B), is comprised of a detailed history of the ineligible categories and reveals some of the themes that have arisen in the cases. One such prominent theme is “preemption.” This focused history of patent law pinpoints the genesis of problematic language used in recent cases and its uncertain implications. Part IV addresses some of the inconsistencies created by the cases outlined in Part III(B) and attempts to answer some of the key questions raised. In particular, this section explains how patentable subject matter can change over time, and how the role of § 101 can be delineated from §§ 102 (novelty) and 103 (non-obviousness).¹⁴ The end of Part IV introduces a more rigorous standard for approaching the important question of whether subject matter is patent eligible under § 101. As previously noted, the proposed test for determining whether a claimed invention is merely an abstract idea essentially asks whether or not the underlying idea of the patent is, in effect, “self-enabling” to a POSITA. Part V addresses recent developments in the law, and specifically explains the district court’s reasoning in *McRO*, and how the court could have benefitted from a more robust standard for evaluating patentable subject matter instead of relying on outdated precedent. Part V also discusses *Ultramercial, Inc. v. Hulu LLC*¹⁵, one of the first CAFC decisions to follow *Alice*, and addresses its overall the impact on the patent system. Specifically, the outcomes in *Alice*, *Ultramercial*, and *McRO* portend unfavorable circumstances not

relevant prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a POSITA. This analysis comprises several factual inquiries, including: (1) the nature and scope of the art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art at the time invention; and (4) secondary considerations. Secondary considerations generally consist of extrinsic evidence that bolsters or weakens the case for non-obviousness, including, inter alia, evidence that others had failed to produce the invention, industry skepticism or rebuke of attempting to create the invention, recognition of the claimed invention as a long felt but unsolved need, industry praise, commercial success, copying, whether the invention could be produced as a result of a combination of prior art references and whether there was a teaching, suggestion or motivation to combine those references. See *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966), see also, e.g., *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361 (Fed. Cir. 2000), cert. denied, 532 U.S. 974 (2001).

14. 35 U.S.C. § 102 (novelty): requires that claimed inventions possess at least one novel feature in order to not be anticipated by a single prior art reference. For patent applications filed after March 16, 2013, the America Invents Act (“AIA”) established a “first to file” system, such that a patentee cannot establish an earlier date than his or her effective filing date. The pre-AIA framework is a “first to invent” system, such that it allows for a patentee to establish an earlier date than his or her effective filing date.

15. *Ultramercial, Inc. v. Hulu LLC*, 772 F.3d 709 (Fed. Cir. 2014).

only for patents held by so-called “patent trolls,”¹⁶ but patents held by small inventors as well.

II. ALICE AND ITS IMPACT

The Supreme Court established the most recent § 101 framework in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*¹⁷ In *Alice*, the Court utilized language from *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*¹⁸ to articulate a two part test for determining whether a claimed invention recites patentable subject matter.¹⁹ The first step of the test involves determining whether a claim is directed to one of the ineligible categories of § 101.²⁰ The second step includes analyzing whether the claim’s elements, considered both individually and as an ordered combination, “transform the nature of the claim into a patent-eligible application.”²¹ This latter step of the analysis is designed to search for an “inventive concept” where, “[s]imply appending conventional steps, specified at a high level of generality” to a method already well known is “not enough to supply [the] inventive concept” needed to make the transformation.²²

A. *The Status Quo – Recent Application of Alice*

Consider the following hypothetical. A small start-up company, specializing in animation software, staffed with a team of prodigious engineers, creates software for automatically animating lip synchronization and facial expressions of three dimensional (3D) characters that rapidly reduces production costs. The start-up invests in patenting the highly coveted software to protect it from being copied by other animation companies, especially sophisticated animation companies equipped with clever methods of reverse engineering that escape the protections of copyright law. The start-up’s founders rely on its patents to secure venture capital funding. With dauntless disregard for the

16. A patent troll, according to some scholars, is a company that aggregates patents and does not engage in the manufacturing of products. Trolls often extract a disproportionate return from operating companies far beyond the value their patented invention adds to the commercial product. Tom Ewing and Robin Feldman, *The Giants Among Us*, 2012 STAN. TECH. L. REV., 1 (2012), available at <http://stlr.stanford.edu/pdf/feldman-giants-among-us.pdf>.

17. 134 S. Ct. at 2355.

18. 132 S. Ct. 1289 (2012).

19. See *id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1296–97 (2012)).

20. *Alice*, 134 S. Ct. at 2355.

21. *Id.* (quoting *Mayo*, 132 S. Ct. at 1297) (internal quotations omitted).

22. *Id.* at 2357 (quoting *Mayo*, 132 S. Ct. at 1294) (internal quotations omitted).

start-up's patent rights, larger companies in the field replicate and utilize the start-up's invention.

The start-up quickly hires a team of lawyers to pursue the infringers in an effort to recoup investors' losses. Yet with the stroke of a pen and the bash of a gavel, the start-up's patent is reduced to nothing. A trial judge characterizes the invention as naught more than a fanciful "abstract idea," unworthy of patent protection by a system that has recognized far less as deserving of such protection.²³ Regardless of one's position on whether patent monopolies have exceeded its limits, it is still quite incredible to suppose that a system for "automatically animating lip synchronization and facial expressions of 3D characters" is nothing more than an "abstract idea."²⁴

The above scenario, although dramatized for emphasis, is from a recent case, *McRO, Inc., v. Activision Publishing, Inc.* *McRO* is just one of at least a dozen others in a recent torrent of district court decisions invalidating computer software patents in the wake of *Alice*.²⁵ In the past year alone, one report states that fifty-five district court and CAFC decisions out of seventy-eight included a successful challenge under § 101 to invalidate one or more patents.²⁶ *Alice* itself is one of a series of recent Supreme Court decisions in patent law, an area on which the Supreme Court had not spoken for many years until *Bilski v. Kappos* in 2010.²⁷ The Supreme Court's recent interest in patent law appears to have been provoked by a series of decisions by the CAFC, which handles all patent cases.²⁸ Unfortunately, the Supreme Court's foray into patent law has not provided the much needed guidance many hoped it would provide.

One difficulty with the Court's methodology is that it does not thoroughly explain how it arrives at its judicial determinations of pa-

23. See, e.g., User-Operated Amusement Apparatus for Kicking the User's Buttocks, U.S. Patent No. 6,293,874 (filed Jan. 4, 2000); Method and Apparatus for Yoga Class Imaging and Streaming, U.S. Patent No. 8,605,152 (filed Feb. 8, 2013); Process for the Treatment of Methane Emissions, U.S. Patent No. 8,071,342 (filed Dec. 29, 2005).

24. See *McRO, Inc. v. Activision Publ., Inc.*, No. 14-CV-336-GW(FFMx), 2014 U.S. Dist. LEXIS 135152, at *1 (C.D. Cal. Sept. 22, 2014).

25. See *id.* at *1, *38; see also Timothy B. Lee, *Software Patents Are Crumbling, Thanks to the Supreme Court*, Vox (Sept. 12, 2014, 3:50pm), <http://www.vox.com/2014/9/12/6138483/software-patents-are-crumbling-thanks-to-the-supreme-court>.

26. See Robert R. Sachs, *Tracking #Alicestorm: The Dead Keep Piling Up*, BilskiBlog (April 10, 2015), <http://www.bilskiblog.com/> (last visited May 6, 2015).

27. See *Bilski v. Kappos*, 561 U.S. 593 (2010).

28. See Robin Feldman, *Coming of Age for the Federal Circuit*, THE GREEN BAG, (forthcoming 2014), available at <http://ssrn.com/abstract=2496763>.

tentable subject matter. This criticism is best captured in a concurrence by Justice Stevens in *Bilski v. Kappos*:

[T]he Court artificially limits petitioners' claims to hedging, and then concludes that hedging is an abstract idea rather than a term that describes a category of processes including petitioners' claims. Why the Court does this is never made clear The Court essentially asserts its conclusion that petitioners' application claims an abstract idea. This mode of analysis (or lack thereof) may have led to the correct outcome in this case, but it also means that the Court's musings on this issue stand for very little.²⁹

While some may be inclined to agree with the outcomes of many § 101 cases, as Stevens did in *Bilski*, the § 101 cases themselves provide little guidance for courts in analyzing future decisions.³⁰

III. HISTORICAL BACKGROUND

A. Repeating History

In the decades before § 103 was drafted, courts fashioned an additional requirement beyond proving novelty: the “invention requirement.”³¹ This requirement was an arbitrary threshold and prompted immediate concern, particularly because of the “unfettered decision-making” of judges reviewing the validity of inventions.³² According to one famous patent lawyer and esteemed judge, Giles Rich, the “requirement for invention . . . left every judge practically scot-free to decide [the] . . . controlling factor according to his personal philosophy of what inventions should be patented, whether or not he had any competence to do so or any knowledge of the patent system as an operative socioeconomic force.”³³

In many of the decisions preceding the 1952 Patent Act, the Court fashioned unworkable, inconsistent, and nonsensical rules that left lower courts unable to decide cases based on a principled analysis. In one decision, for instance, *Lincoln Eng'g Co. v. Stewart-Warner Corp.*, the Supreme Court decided the patentability of an improved “coupling member” for attaching a headed fitting to a grease gun.³⁴ The patent claim included not only the coupling member, but the coupling mem-

29. *Bilski v. Kappos*, 561 U.S. 593, 620–21 (2010) (Stevens, J., concurring).

30. See, e.g., *McRO*, 2014 U.S. Dist. LEXIS 135152, at *13 (“[T]he two-part test for identifying an abstract idea appears to be of limited utility . . .”).

31. CRAIG A. NARD, *THE LAW OF PATENTS*, 348, (3d ed., 2014).

32. *Id.*

33. Giles S. Rich, *The Vague Concept of “Invention” as Replaced by Section 103 of the 1952 Patent Act*, in *NONOBVIOUSNESS: THE ULTIMATE CONDITION OF PATENTABILITY* 1:401, 1:409 (John F. Witherspoon ed., 1980) (internal quotations omitted) (emphasis omitted).

34. *Lincoln Eng'g Co. of Ill. v. Stewart-Warner Corp.*, 303 U.S. 545, 549 (1938).

ber in connection with the headed fitting and the grease gun.³⁵ The Court held that combining a new and non-obvious component, i.e. the coupling member, with “old and well known devices[,]” i.e. the headed fitting and grease gun, which performed “no new or different function[,]” did not result in a patentable invention.³⁶ Essentially, the Court’s rule in *Lincoln Engineering* was that even if an article or process (A) is patentable by itself, if it is combined with other devices or steps (B and C), a claim to (A–C) is *not patentable* if the combination performs fundamentally the *same function* as B and C.³⁷ This rule would cause serious difficulties for patentees attempting to avoid patent exhaustion,³⁸ for instance, in the case where he or she is unable to market device (A) alone, without combining A with B and C. If the patentee can only patent device (A) alone, and the patentee cannot not make money by selling device (A) alone, then the patentee may lose incentive to produce device (A) because the patentee is unable to profit from the invention without combining it with B and C. Hence, this case was one among many that galvanized efforts to enact patent reform, and was effectively overruled with the passage of the 1952 Patent Act.³⁹

This “invention requirement” bears a striking resemblance to the evolving “inventive application” requirement in the Court’s modern § 101 jurisprudence, as first introduced in *Parker v. Flook*.⁴⁰ Courts were previously able to rule out elements of claims as being “well-known” without any factual basis and determine that inventions, while tangible, are paradoxically “abstract.” As the saying goes, “[t]hose who cannot remember the past are condemned to repeat it.”⁴¹ Without a rubric to guide courts in determining patentable subject matter, specifically a factual determination of what ideas simply apply “well-understood,

35. *Id.*

36. *Id.* at 548–49.

37. *See id.* at 549–50.

38. *See* United States v. Univis Lens Co., 316 U.S. 241, 250 (1942) (defining patent exhaustion as follows: “The patentee may surrender his monopoly in whole by the sale of his patent or in part by the sale of an article embodying the invention. His monopoly remains so long as he retains the ownership of the patented article.”)

39. *See* In re Bernhart and Fetter, 417 F.2d 1395, 1402–03 (1969); *see also* Radio Steel & Mfg. Co. v. MTD Prods., Inc., 731 F.2d 840, 845 (Fed. Cir. 1984) (reaffirming Court of Customs and Patent Appeals’ holding that “the only proper basis for an old combination rejection is . . . section 112”) (emphasis added) (internal quotations omitted); KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007) (“[A] patent composed of several elements is not proved [unpatentable] merely by demonstrating that *each of its elements was, independently, known in the prior art.*”) (emphasis added).

40. *Parker v. Flook*, 437 U.S. 584, 594 (1978).

41. George Santayana, *Reason in Common Sense*, in *THE LIFE OF REASON*, 1, 284 (2d ed., Charles Scribner’s Sons 1948).

routine, [and] conventional activit[ies,]"⁴² there will no doubt be a reversion to the capricious decision-making process that preceded the enactment of § 103.

B. A Summary of the Supreme Court's Approach to Interpretation of § 101

When one examines the leading § 101 cases, there are several prominent themes that emerge. The most important is called "preemption," and from preemption, the Court derives two additional distinct principles: (a) there must be at least one inventive application,⁴³ and (b) the claimed invention must be "more than a simple step" from an underlying idea.⁴⁴ The doctrine of preemption holds that patent claims that would broadly preclude the use of basic tools of research are unpatentable.⁴⁵ The concerns surrounding the idea of preemption stem from the fear that patents claiming the basic tools of research hinder, rather than promote, innovation.⁴⁶ It is from this concern that the categories are supposedly derived.⁴⁷ One of the first cases to recognize the importance of avoiding preemption in patent law was *O'Reilly v. Morse*, in which the patentee, Morse, attempted to claim the invention of the telegraph in the following manner:

I do not propose to limit myself to the specific machinery . . . described in the foregoing specifications and claims; the essence of the invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed for marking or printing intelligible characters, signs, or letters at any distances, being a new application of that power of which I claim to be the first inventor or discoverer.⁴⁸

Because Morse did not limit his claim to the particular uses set out in the specification, the Court held that he effectively claimed the exclusive right to *every improvement* where the motive power was electro-magnetic and the invention achieved writing at a distance.⁴⁹ It is certainly true, in this case, that there was complete preemption of the idea in the abstract because the patent was not limited to any particu-

42. *Alice*, 134 S. Ct. at 2359 (quoting *Mayo*, 132 S. Ct. at 1294).

43. *Brenner v. Manson*, 383 U.S. 519, 535 (1966).

44. *See Flook*, 437 U.S. at 590.

45. *See Bilski v. Kappos*, 561 U.S. 593, 658 (2010) (Breyer, J., concurring).

46. *See Gottschalk v. Benson*, 409 U.S. 63, 67 (1972).

47. *See Bilski*, 561 U.S. at 601-02 ("While these exceptions are not required by the statutory text, they are consistent with the notion that a patentable process must be 'new and useful.' And, in any case, these exceptions have defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years") (quotations in original) (emphasis in original).

48. *O'Reilly v. Morse*, 56 U.S. 62, 112 (1853) (internal quotations omitted).

49. *Id.*

lar machinery. However, under current laws, precedent, and procedures set out in the Manual of Patent Examination Procedure (MPEP), examiners would be more likely to reject Morse's claim under § 112 because he had failed to enable every embodiment that includes writing at a distance, such as text messaging.⁵⁰

In *Brenner v. Manson*, the Supreme Court expressed that § 101 demands that a claimed invention must have at least one useful application in order to be patentable.⁵¹ When invalidating a patent on a new class of steroids, the Court famously decreed that "a patent is not a hunting license"⁵² and "[u]ntil the process claim has been reduced to production of a product shown to be useful, the metes and bounds of that monopoly are not capable of precise delineation."⁵³ The Court reasoned that the patent failed to qualify as "new and useful" under § 101 because the steroids at issue had no demonstrated application other than an "object of use-testing".⁵⁴

The Court revisited the preemption doctrine in *Gottschalk v. Benson*, where it addressed the validity of a software patent directed to the conversion of binary-coded decimal (BCD) numerals to binary numerals.⁵⁵ The Court concluded that the process claim was drafted so abstractly that it covered "both known and unknown uses of the BCD to pure binary conversion," and thus there was complete preemption.⁵⁶ This conclusion was based on two premises: (1) the conversion was merely a series of mathematical calculations, each of which could be done mentally,⁵⁷ and (2) the conversion's only useful function was on a computer and so preempted every "substantial practical application," thus constituting a patent effectively on the mathematical formula itself.⁵⁸ Essentially, the rule from *Benson* is that if the patent claims a mathematical formula that has *only one substantial practical application* that is covered by the claims in the patent, then the claim achieves *de facto* complete preemption of the formula itself, and therefore is not patentable.

Following its reasoning in *Benson*, the Supreme Court in *Parker v. Flook* pronounced that an invention must also be *more than a simple*

50. See 35 USC § 112(b) (2012); see also MPEP § 2173 (9th ed. Mar. 2014).

51. *Brenner v. Manson*, 383 U.S. 519, 535 (1966).

52. *Id.* at 534, 536.

53. *Id.* at 534.

54. *Id.* at 535.

55. *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972).

56. *Id.* at 68.

57. See *id.* at 67.

58. See *id.* at 71–72.

step from an unpatentable idea.⁵⁹ The Court resolved that even if an inventor adds insignificant post-solution components, or limits the use of the abstract idea to one field of use, this addition does not save a claim from being an unpatentable abstract idea.⁶⁰ In *Flook*, the Court held that the system of updating alarms for a catalytic converter process was a mere “post-solution” activity even though it did not wholly preempt the use of the mathematical formula and thus the claimed invention was not patentable subject matter.⁶¹ The Court implicitly assumed that, although scientific principles and mathematical formulas are a product of human thought, their existence is independent of human activity. Thus, a mathematical algorithm, like a scientific principle, reveals a relationship that “has always existed[.]”⁶² Hence, mathematical algorithms cannot be patented⁶³ even if they are novel (i.e. original). Similarly, claims that encompass specific uses of mathematical formulas are also ineligible for patent protection.⁶⁴ The Court explained:

The chemical processes involved in catalytic conversion of hydrocarbons are *well known*, as are the practice of monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for ‘automatic monitoring-alarming’. . . respondent’s claim is, in effect, comparable to a claim that the formula $2\pi r$ can be usefully applied in determining the circumference of a wheel.⁶⁵

Although the Court’s logic employs a kind of *petitio principii*,⁶⁶ the Court’s rule is that a patent that employs the use of a mathematical formula will not become patentable by merely asserting a token implementation of the formula.⁶⁷ The token implementation is insufficient to overcome the § 101 hurdle because the determination of patent eligibility should not depend simply on the “draftsman’s art” in

59. See *Flook*, 437 U.S. at 590.

60. *Bilski*, 561 U.S. at 610–11.

61. *Flook*, 437 U.S. at 589–90.

62. *Flook*, 437 U.S. at 592 (“We think this case must also be considered as if the principle or mathematical formula were well known”); *Id.* at 593 n. 15 (“The underlying notion is that a scientific principle, such as that expressed in respondent’s algorithm, reveals a relationship that has always existed”).

63. *Id.* at 585.

64. *Id.* at 595 (quoting *In re Richman*, 563 F.2d 1026, 1030 (1977)).

65. *Flook*, 437 U.S. at 594–95.

66. The Court’s argument is essentially circular because the Court began with assuming that the mathematical formula was part of the prior art, see note 63, and then relied on this assumption to base its conclusion that the patent was nothing more than patenting the simple application of a mathematical formula.

67. See *id.* at 595; see also *Diamond v. Diehr*, 450 U.S. 175, 177 (1981).

masking the patenting of an unpatentable formula.⁶⁸ In other words, the Court is concerned that a patentee can appear to limit the invention to one field of use through careful ‘draftsmanship,’ and then later, after patent issuance, can prevent others from using the invention in other fields of use. How a patentee might do this is never explained, but one possible way is through the doctrine of equivalents. This idea is discussed further in Part IV.

The Supreme Court retreated from its rule articulated in *Flook*⁶⁹ in *Diamond v. Diehr*. In *Diehr*, the Court upheld the validity of a patent directed to “a process for curing synthetic rubber which includes in several of its steps the use of a mathematical formula and a programmed digital computer.”⁷⁰ A slim majority (5 Justices) held that the claim was not an attempt to patent a mathematical formula, but rather a claim to an “industrial process for the molding of rubber products.”⁷¹ The Court characterized the claim as *not* merely being a token activity, because the mathematical equation involved was simply used in “conjunction with all of the other steps in their claimed process.”⁷² The Court acknowledged that the process employed a “well-known mathematical equation”⁷³ but noted that “[t]he ‘novelty’ of any element or steps in a process, or even of the process itself, [was] of *no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.”⁷⁴

The Court revisited the preemption doctrine again in *Bilski v. Kappos*, where the Court analyzed a patent claim it characterized as “hedging risk and the application of that concept to energy markets.”⁷⁵ The Supreme Court reversed the CAFC in *Bilski* and rejected the patent

68. *Flook*, 437 U.S. at 593.

69. Scholars have characterized the facts of *Diehr* and *Flook* as being “uncomfortably similar[.]” Brief of Amici Curiae on Behalf of Neither Party, Professor Robin Feldman, p. 23 n. 10, *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014).

70. *Diehr*, 450 U.S. at 177.

71. *Id.*

72. See *Diehr*, 450 U.S. at 187. Later decisions characterize the holding *ad hoc* to describe a process that was novel even though the Court may no findings about the novelty of the process. See *Alice*, 134 S. Ct. at 2360 (“the claims in *Diehr* were patent eligible because they improved an existing technological process, not because they were implemented on a computer.”) (emphasis added), see also *Mayo*, 133 S. Ct. at 1299 (“[*Diehr*] nowhere suggested that all these steps, or at least the combination of those steps, were in context obvious, already in use, or purely conventional.”), see also *Bilski*, 561 U.S. at 611 (“*Diehr* claimed a previously unknown method for molding raw, uncured synthetic rubber into cured precision products using a mathematical formula.” (internal quotations omitted)).

73. *Diehr*, 450 U.S. at 186.

74. *Id.* at 188; *Id.* at n. 13 (rejecting argument that claim must be dissected into “old and new elements”). This shift in position can be explained in part by the fact that four Justices from the majority in *Flook* were in the dissent in *Diehr*.

75. *Bilski*, 561 U.S. at 609.

claim, quoting Chief Judge Rader's dissent: "[h]edging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class."⁷⁶ The Supreme Court then concluded that:

The concept of hedging, described in claim 1 and reduced to a mathematical formula in claim 4 is an unpatentable abstract idea, just like the algorithms at issue in *Benson* and *Flook*. Allowing petitioners to patent risk hedging would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.⁷⁷

Thus, the Court reemphasized the *complete preemption* doctrine, but also revived the *more than a simple step* rule articulated in *Flook* by holding that: (1) limiting the abstract idea of hedging risk to "one field of use," i.e., the energy market, and (2) adding "token post-solution components," i.e., the use of "well-known random analysis techniques," were both insufficient to overcome being an unpatentable "abstract idea."⁷⁸ In addition, the Court's new rule in *Bilski* introduced an element of novelty into the "abstract idea" inquiry, ascribing significance to the fact that the methods for hedging were "well-known" in the art, contrary to the Court's earlier repudiation of interjecting novelty into the § 101 analysis in *Diehr*. This contradiction is discussed in greater depth in Part IV.

Mayo Collaborative Servs. v. Prometheus Labs. involved a patent directed to a method of treating immune mediated gastrointestinal disorder in two steps: (1) administering a drug providing 6-thioguanine to a patient, and (2) determining the level of 6-thioguanine.⁷⁹ To determine the level of 6-thioguanine, the claim specified a range of concentrations where certain levels corresponded with a need to *increase* or *decrease* concentration of the drug.⁸⁰ The Court held that the claim was nothing more than exploiting the "natural relationship" of the human body's metabolization of thiopurine.⁸¹ Although the substance was synthetic, the Court noted that scientists were already familiar with the correlation between harmful and beneficial doses of the drug.⁸² To arrive at his 'invention' therefore, the patentee had simply

76. In re *Bilski*, 545 F.3d 943, 1013 (Fed. Cir. 2008) (Rader, C.J., dissenting). Arguably Rader's quote was taken out of context, as a sentence prior he wrote: "Bilski's method for hedging risk in commodities trading is either a *vague economic concept* or *obvious on its face*." *Id.* at 1013 (emphasis added). Thus, this statement suggests that Judge Rader would have rejected the claim under § 112 for indefiniteness or alternatively under § 103 for obviousness.

77. *Bilski*, 561 U.S. at 611-12.

78. *See id.* at 612.

79. *Mayo*, 133 S. Ct. at 1295.

80. *Id.* at 1296.

81. *Id.* at 1297.

82. *Id.* at 1295.

identified the “correlations with some precision.”⁸³ The second step in the patent, which told “doctors to engage in well-understood, routine, conventional activity previously engaged in by scientists in the field,” added nothing “significantly more than an instruction to doctors to apply the applicable [natural] laws.”⁸⁴ Accordingly, the rule articulated in *Mayo* is that whether or not a claim adds “significantly more” to a natural law is judged in light of prior art.⁸⁵ However, the Court is silent as to what art is relevant under § 101, and how this inquiry is distinct from the non-obviousness inquiry of § 103.⁸⁶ This is also discussed in greater depth in Part IV.

In *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.* the Supreme Court addressed the third category of ineligible subject matter, naturally occurring substances, and decided two questions: first, whether a patent may issue for an isolated DNA segment that is identical to how it appears in the human body, and second, whether a patent may issue for “synthetically created DNA,” i.e., complimentary DNA (cDNA), which is functionally equivalent to a native DNA segment without the non-coding regions.⁸⁷ The patents at issue were the result of Myriad’s discovery of the location and sequence of the BRCA1 and BRCA2 genes, which enable detection of an increased risk of breast cancer.⁸⁸ By knowing the typical nucleotide sequence of the BRCA1 and BRCA2 genes, one can extract a sample of a test subject’s DNA, compare that sample to the typical sequence(s), and then detect mutations in the test subject’s DNA.⁸⁹ If mutations are detected, then there is an increased risk of breast cancer.⁹⁰ To discover these sequences, Myriad used an “iterative process” that was “well understood,” uniform, and widely used insofar as any scientist engaged in the search for a gene

83. *Id.*

84. *Id.* at 1298.

85. Prior art includes any reference used to preclude patentability under §§ 102 or 103. Prior art may encompass written sources and unwritten sources, subject to the language and interpretation of §§ 102 and 103. To be prior art, a reference must antedate the priority date of the invention and must be analogous, meaning that it exists in the field of endeavor of the invention or it is reasonably pertinent to the problem that the invention solves. *See In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992).

86. *See id.* at 1304 (“We recognize that, in evaluating the significance of additional steps, the § 101 patent eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap. But that need not always be so. And to shift the patent eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do”).

87. 133 S. Ct. 2107, 2111 (2013).

88. *Myriad*, 133 S. Ct. 2112-13.

89. *Id.* at 2112, 2117 (citation omitted).

90. *Id.* (citation omitted).

would have likely used a similar approach.⁹¹ For this discovery, however, Myriad obtained two patents: one on the BRCA1 and BRCA2 genes as they appear in the human body, and another on the corresponding cDNA.⁹² The Court held that merely *isolating a certain subset of the entire genomic sequence of human DNA is insufficient to make it patentable*.⁹³ On the other hand, the second patent, which claimed cDNA, was ‘substantively different’ from how it appeared in the human body, and therefore was not naturally occurring.⁹⁴ The Court left open the possibility that the second patent was obvious, stating that it “express[es] no opinion whether cDNA satisfies the other statutory requirements of patentability.”⁹⁵

The result in *Myriad* is perplexing insofar as its jurisprudence is inconsistent with *Bilski* and *Mayo*. The Court had not overlooked the facts that the process used to isolate the DNA sequence was “well understood,” and the creation of synthetic DNA was “well known.”⁹⁶ Thus, *Myriad* stands apart from cases requiring that the patentee contribute “significantly more” than what already occurs in nature. Despite the fact that cDNA is trivially different from the patent ineligible native DNA sequence, the Court did not require that the invention be more than a simple step from the naturally occurring substance, only that it be structurally distinct. *Myriad* thus sets the ineligible category of “naturally occurring” substances apart from the abstract idea and natural law categories addressed in *Flook* and *Mayo*, respectively.

Finally, the Court’s most recent § 101 case, *Alice*, addressed the patentability of a computer program designed to mitigate settlement risk.⁹⁷ The Court declared that “the relevant question is whether the claims here do more than simply instruct the practitioner to *implement* the abstract idea of intermediated settlement on a generic computer.”⁹⁸ The Court first analyzed each element of the claim separately, and then as “an ordered combination.”⁹⁹ The Court found that each step of the process was “purely conventional,” recited “basic functions of a computer[,]” and that the functions were “well-understood, routine, conventional, activities” previously known to the industry.¹⁰⁰ Considering

91. *Id.* at 2118–20 (citation omitted).

92. *Id.* at 2116, 2119.

93. *Myriad*, 133 S. Ct. at 2120.

94. *Id.* at 2119.

95. *Id.* at 2119 n.9 (citation omitted).

96. *Id.* at 2112, 2119.

97. *Alice*, 134 S. Ct. at 2351.

98. *Id.* at 2359.

99. *Id.* (internal quotation marks omitted).

100. *Id.* (citations omitted) (internal quotation marks omitted).

the claim as a whole, the Court found that the claims did not, for example, “improve the functioning of the computer itself,” or “effect an improvement in any other technology or technical field.”¹⁰¹ Rather, the claims were “nothing significantly more than an instruction to apply the abstract idea of intermediated settlement using some unspecified, generic computer.”¹⁰² The Court seemed to focus on the notion that the patent at issue was nothing more than a “wholly generic computer implementation.” At oral argument, Justice Kennedy twice inquired about how difficult it would be to create a program for intermediated settlement:

“If you describe that to a second-year college class in engineering and said here’s - - here’s my idea, now you go home and you program over this weekend, my guess is - - my guess is that that would be fairly easy to program.”

Mr. Phillips, Counsel for Petitioners: “I don’t disagree with it, Justice”

. . . .

“Suppose I thought - - and, again, it’s just a thought because I don’t have the expertise - - that any computer group of people sitting around a coffee shop in Silicon Valley could do this over a weekend. Suppose I thought that.”

“You mean wrote the code?”

“Yes.”

“Right. Well, that’s absolutely - - I’m certain that’s true. . . . But that’s true of almost all software.”¹⁰³

Thus, it became apparent to the Justices that the claimed program in the patent was nothing more than a “generic” implementation of an abstract idea, i.e., mitigating settlement risk, which became a pervasive theme in Justice Thomas’ opinion.¹⁰⁴ The Court reasoned that the pro-

101. *Id.* (citation omitted).

102. *Id.* at 2360 (citation omitted) (internal quotation marks omitted).

103. Transcript of Oral Argument at 5, 12, *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014) (No. 13-298).

104. *Alice*, 134 S. Ct. at 2352 (“[M]erely requiring *generic* computer *implementation* fails to transform abstract idea into a patent-eligible invention.”) (emphasis added); *Id.* at 2357 (“We conclude that the method claims, which merely require *generic* computer *implementation*, fail to transform that abstract idea into a patent-eligible invention.”) (emphasis added); *Id.* at 2358 (“mere recitation of a *generic* computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention. . . . Given the ubiquity of computers . . . wholly *generic* computer *implementation* is not generally the sort of additional feature that provides any practical assurance that the process is more than a drafting effort designed to monopolize the abstract idea itself.”) (emphasis added) (citations omitted) (internal quotation marks omitted); *Id.* at 2359 (“the relevant question is whether the claims here do more than simply instruct the practitioner to implement

gram effectively preempted the use of the abstract idea of mitigating settlement because it was merely a generic implementation.¹⁰⁵ Despite the term “generic” being echoed throughout the Court’s opinion, the term was never distinctly explained. Part IV of this paper attempts to interpret what a “generic implementation” is in light of other precedent and harmonize *Alice* with other § 101 cases. Specifically, Part IV clarifies what generic means for inventions that “preempt” the use of an abstract idea, natural law, or naturally occurring substance.

IV. IMPORTANT QUESTIONS ARISING FROM THE § 101 CASES

A. Reconciliation of Inconsistencies

Even a cursory review of the § 101 cases discussed in Part III reveals a number of inconsistencies and points of uncertainty in the law. Some of the questions that arise from the cases that are asked and (attempted to be) resolved in this section:

1. *Does patentable subject matter change over time? If so, why?*
2. *What function does § 101 provide in limiting patentable subject matter that §§ 102 and 103 do not?*
3. *What is the generic implementation standard? How is the “generic implementation” analysis distinct from analysis under §§ 102 and 103?*
4. *What function does § 101 provide in limiting patentable subject matter that § 112 does not? What is the relationship of § 101 to the doctrine of equivalents?*
5. *Does the generic implementation requirement contravene other provisions of § 103?*
6. *How could courts more uniformly evaluate whether an invention is patentable under § 101?*

1. How patentable subject matter changes over time

The Supreme Court appears to vacillate between patentable subject matter being timeless, and being time-contingent. As a result, some inventions might be patentable subject matter under § 101 at one time and not at other times. Recall from Part III, the Court in *Diehr* ex-

the abstract idea of intermediated settlement on a *generic* computer. . . . In short, each step does no more than require a *generic* computer to perform *generic* computer functions. . . . Viewed as a whole, petitioner’s method claims simply recite the concept of intermediated settlement as performed by a *generic* computer.”) (emphasis added).

105. *Id.* at 2358.

pressed that “[t]he ‘novelty’ of any element or steps in a process, or even of the process itself, is of *no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.”¹⁰⁶ Yet later in *Alice*, the Court broke down the claim into elements and examined whether each step is “well-known” or not in determining patentability. This inconsistency can be explained through understanding the evolution of the “preemption” doctrine throughout the case law.

First, in *O’Reilly v. Morse*, the Court recognized the concept of *complete preemption*: When an applicant attempts to claim not only his invention, but also future inventions that embody the same *principle* underlying his invention, he or she is precluded from obtaining a patent for such a claim because he or she has essentially claimed the principle itself. The Court in *Benson* recognized *de facto complete preemption*: When there exists only *one substantial practical application* of an idea, a claim directed toward that one application is unpatentable. In *Flook*, the Court expressed that § 101 not only precludes complete preemption, but also *simple limitations* to a particular field of use or “post-solution activity.” In *Mayo*, the Court seemed to acknowledge that *what limitations of an idea are simple is subject to change over time*.¹⁰⁷ To wit, although natural laws and relationships are treated as though they exist apart from any human action, whether an invention is more than a *trivial* implementation of that law may depend on what is “well-known” at the time of the invention.¹⁰⁸ Thus, what constitutes a “simple step” from unpatentable subject matter will change over time, because the tools available to inventors implementing an idea will change.

The oral argument dialogue is particularly informative in demonstrating the qualitative analysis for preemption. In response to questions by Justice Kennedy during oral argument, counsel for petitioners effectively conceded that the patent at issue was an invention that *could be programmed* in a *relatively short time* (“a weekend”), by someone of *ordinary skill in the art* (“a second-year college class”) on a *generic computer*. Although the Court does not explicitly acknowledge these factors, it held that a “wholly generic computer implementation” is insufficient for patentability, and that the claims at issue here were

106. *Diehr*, 450 U.S. at 189 (emphasis added).

107. *See Mayo*, 132 S. Ct. at 1297.

108. *Parker v. Flook*, 437 U.S. 585, 592 (1978) (“We think the case must be considered as if the principle being well known.”), *Id.* at 593 n.15. (“The underlying notion is that a scientific principle, such as that expressed in respondent’s algorithm, reveals a relationship that has always existed”).

tantamount to stating ‘apply this idea’ to a computer.¹⁰⁹ Thus, in analyzing the computer program as merely a “generic implementation,” the Court tacitly recognized a qualitative inquiry into the simplicity of implementation. The rule in *Alice* is ultimately that when an implementation of an idea is “generic,” that idea is effectively preempted, and a claim capturing that generic implementation is therefore not patentable.

2. The functions § 101 provides in limiting patentable subject matter that §§ 102 and 103 do not

One way § 101 clearly precludes patentability where § 103 does not is in the context of natural laws and naturally occurring substances generally. If a person discovers a natural law or naturally occurring substance and attempts to patent it, the only source of prior art is nature itself. To wit, laws of nature and naturally occurring substances are inherently “practiced” by nature, and thus are not novel.¹¹⁰

One celebrated law of nature that the Supreme Court frequently declares could not be patented is $E=mc^2$.¹¹¹ The law itself, the interchangeability of mass and energy (as opposed to the mathematical formula) is ubiquitous in nature, the sun’s fusion of hydrogen and helium being one of numerous examples. Thus, even if Einstein was the first to postulate the universal truth of nature’s mass-energy relationship, nature has been inherently undergoing the mass-energy conversion process for billions of years. In the novelty context, previously unappreciated discoveries about the way things already in existence operate do not give rise to invention if they were already part of the public domain. However, prior art under §§ 102 (novelty) and 103 (non-obviousness) is confined to printed publications, offers for sale, and other forms of commercial exploitation, all of which are works of man. Thus, § 101 carves out patentable subject matter in which nature has practiced even if man has not written about or applied those subjects.

109. *Alice*, 134 S. Ct. at 2350–51.

110. Inherency is a concept that already exists for prior art references under §§ 102 (novelty) and 103 (non-obviousness): “[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art’s functioning, does not render the old composition patentably new to the discoverer.” *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347, (Fed. Cir. 1999). In other words, a reference can anticipate or render obvious a claimed invention on the basis of express or inherent disclosure. Thus the claiming of a new use, new function or unknown property which is already present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254 (C.C.P.A. 1977).

111. *Mayo*, 132 S. Ct. at 1293.

In patent law generally, though an invention may have a certain novel patina, the invention must ultimately be comprised of more than a generic implementation of what already exists either in nature or in the corpus of human knowledge. It is perhaps useful to think of natural laws and naturally occurring substances as just another form of prior art, “§ 101 art.” Just as obviousness prevents patentability for taking an invention and simply substituting one material for another, § 101 prevents a person from taking what existed previously in nature and simply finding a trivial application. The next section explores the “generic implementation” doctrine under § 101 more definitively.

3. What the generic implementation standard is and how it is distinct from analysis under §§ 102 and 103

Although the generic implementation requirement¹¹² significantly overlaps with the novelty and non-obviousness analysis under §§ 102 and 103, respectively, it specifically carves out patentable subject matter where §§ 102 and 103 do not. In *Alice*, the Court appeared to undergo a vague, ‘quasi-obviousness’ analysis in breaking down each function in the software and finding that each one constituted a “well-understood, routine, conventional, activit[y] previously known to the industry.”¹¹³ However, it was not simply the fact that the idea existed before that was problematic. Rather, it was the simplicity with which one could apply the idea to a computer that troubled the Court. The novelty and non-obviousness of components is relevant in determining whether the invention is more than a *simple step* from the unpatentable subject matter. This doctrine comports with traditional property rights values; a patent should not be granted where the invention would not have been disclosed or devised but-for the grant of a patent. Phrased another way, if an applicant would not have sought a patent on an invention that took limited time and skill to implement if it were not for the patent system, then the applicant should not be entitled to the exclusive use of that invention.

Furthermore, § 101 may preclude patentability where § 103 (non-obviousness) does not if there existed an “infinite set of solutions” or unpredictable solutions to the inventor at the time of invention, but the inventor employed a well-known and conventional methodology in ar-

112. For the sake of this paper, “generic” means “having no particularly distinctive quality or application” and implementation means “the process of putting a decision or plan into effect; execution.” Thus a generic implementation, according to my definition, is one where there is “no particularly distinctive quality in the process of executing an invention.”

113. 134 S. Ct. at 2358 (citations omitted) (internal quotation marks omitted).

iving at the solution/invention. In *KSR v. Teleflex*, the Court explained how a finding of obviousness could be based on the secondary factor of § 103, “obvious to try.”¹¹⁴ The Court in that case opined that using a known process to solve a problem when there are a finite number of predictable solutions and a person of ordinary skill knows to pursue those solutions, the result will be obvious.¹¹⁵ In other words, even if a solution is not known at the time before the applicant starts trying the different solutions but there are a limited number of predictable solutions, one of which includes his claimed invention, the applicant may not have the benefit of a patent from the invention because it is obvious. An applicant can escape this rationale, however, if there are *unpredictable* solutions, but there are still a limited number of avenues to pursue.¹¹⁶ Accordingly, it is perhaps a flaw of § 103 (insofar as it conflicts with general notions of what should be patentable) that certain applicants can circumvent obviousness when they can persuasively argue that there were an infinite set of solutions or that there were unpredictable solutions, despite the fact that the applicants employed a simple methodology in arriving at the solution/invention.

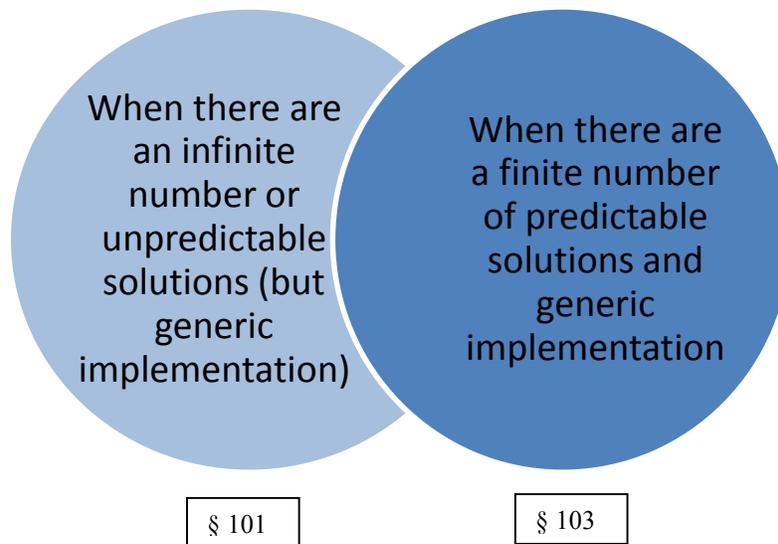


Fig. 1

114. *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

115. *Id.*

116. Even if a solution falls within a small range of values, for example, between 0 and 1, there are infinitely many values between 0 and 1 according to mathematics.

In *Mayo*, for example, the Court recognized that the only inventive aspect of the claim was the range of values for which the patentee had discovered the optimal values for therapeutic efficacy.¹¹⁷ The patentee did not invent the thiopurine drug, and scientists were already well aware of the correlation between therapeutic efficacy and toxicity.¹¹⁸ Thus, the patentee had simply implemented standard tests to discover what the previously unknown range was.¹¹⁹ Arguably, the discovery of the optimal range was inevitable, and perhaps obvious under the definition of § 103. But other cases suggest that employing known methods without a reasonable expectation of success, e.g. where there exists infinitely many possibilities for variation, and prior art gives no indication of parameters that are likely to be critical, there may be a finding of non-obviousness.¹²⁰ Nothing in the facts of *Mayo* suggested that scientists at the time of the invention necessarily knew which parameters might be optimal. Nonetheless, without undue experimentation, the patentee could potentially escape obviousness (albeit narrowly) and obtain a patentable invention using well-known techniques if § 101 did not preclude patentability. Thus, if § 101 precludes patentability for “generic implementations,” it may serve to prohibit patentability for inventions that are non-obvious under traditional secondary considerations of § 103.

4. WHAT ROLE § 101 PROVIDES IN LIMITING PATENTABLE SUBJECT MATTER THAT § 112 DOES NOT AND THE DOCTRINE OF EQUIVALENTS.

Section 112 requires, *inter alia*, that the specification provides a written description of the claimed invention and enables the claimed invention. Section 101, broadly speaking, precludes claims encompassing all uses of an idea and naturally occurring substances. If a patentee simply claims an idea itself, it is possible that all uses may be enabled. As discussed in Part III(B), Morse’s claim included literally all uses of writing at a distance using electricity, but because he did not enable all uses of the idea his claim would more likely be rejected or invalidated under § 112. However, claims that cover substantially every practical application, or claims that cover a generic implementation, would not be rejected under § 112 for lack of enablement *per se*. If the specification (1) enables and describes uses for substantially every practical

117. *Alice*, 132 S. Ct. at 1295.

118. *Id.*

119. *Id.*

120. *In re O’Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988).

application of the underlying idea or (2) the claims are narrowed to one or more generic implementations of the underlying idea, both such claims are still enabled.

In the first situation, when a claim encompasses substantially all uses of an idea, and the claim is enabled by the specification, the doctrine of *de facto* complete preemption articulated in *Benson* prevents patentability. In the second situation, when a claim is narrowed to one or more generic implementations of an idea, the generic implementation standard prevents a patentee from effectively asserting ownership of an idea. Recall that in *Alice*, the Court remarked that a “wholly *generic* computer *implementation* is not generally the sort of additional feature that provides any practical assurance that the process is more than a drafting effort to monopolize the abstract idea itself.”¹²¹ However, the Court did not adequately explain how a claim capturing a generic implementation can prevent every use of the “abstract idea.”

One possible way a patentee could capture other uses of a general idea, when other uses have not been specifically claimed, is through the use of the *doctrine of equivalents*. Under the doctrine of equivalents, a patentee may assert non-literal infringement of claims when the defendant’s activity is one that an ordinary practitioner would recognize as a substantial equivalent to the patentee’s claim at the time of infringement.¹²² The potential danger of generic implementation claims lies in the ability of the patentee to assert infringement on other uses of the “abstract idea.” One approach to using the doctrine of equivalents is to construct a hypothetical patent claim that literally covers the defendant’s activity, and determine whether the hypothetical claim could have been allowed by the Patent and Trademark Office (PTO) over the prior art.¹²³ Notably this inquiry is not limited by what claims would have been granted under § 112, but only §§ 102 (novelty) and 103 (non-obviousness).¹²⁴ Thus, under this analysis, a patentee, such as the one in *Bilski*, could hypothetically draft his or her claim to limit the concept of hedging to energy markets, and may assert infringement against a defendant in the real estate market, for instance, claiming that it is a “substantial equivalent” to the energy market. In this way, the patentee in *Bilski* could have effectively claimed the abstract idea of hedging by being able to assert his patent against other defendants

121. 134 S. Ct. at 2358 (emphasis added) (citation omitted) (internal quotation marks omitted).

122. See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997).

123. *Wilson Sporting Goods Co. v. David Geoffrey & Assoc.*, 904 F.2d 677, 684 (Fed Cir. 1990).

124. See *id.*

that practice substantial equivalents. More generally, if an applicant were granted a patent to a generic implementation claim that satisfies the requirements of § 112, the patentee could effectively claim every application of an abstract idea by being able to assert non-literal infringement of the claim via the doctrine of equivalents. Thus, the generic implementation requirement performs a role in prohibiting claims that would otherwise satisfy the requirements of § 112.

5. The generic implementation requirement does not contravene other provisions of § 103

In § 103, there is a provision that states, “Patentability shall not be negated by the manner in which the invention was made.” While the generic implementation requirement necessitates an inquiry into the manner in which an invention could be made, it does not require an inquiry into the manner in which the invention was made *per se*, and thus is not in contravention of § 103.

This provision in § 103 was intended to abolish the test of patentability expressed in the controversial phrase “flash of genius test,” one of the standards utilized before the passage of the 1952 Patent Act.¹²⁵ The new standard intended to make it immaterial whether the invention resulted from long toil and experimentation or from a flash of genius.¹²⁶ The flash of genius test is distinguishable from the “generic implementation” standard, which inquires not into the manner in which the actual invention was made, but into the manner in which an embodiment of the invention *could be made*. While it may be probative to inquire into the manner in which the patentee manufactured the invention, the patentee need not demonstrate that the invention required long toil and experimentation, for example. Rather, it should be sufficient to show that a person of ordinary skill could not implement the invention with relative ease.

6. How courts can more uniformly evaluate whether an invention is patentable subject matter under § 101

The standard I suggest in this section is nothing more than what was proffered with § 103 at the time of the 1952 Patent Act: A “substitute that would make more sense, would apply to all kinds of inventions, would restrict the courts in their arbitrary, a priori judgments on patentability, and that, above all, would serve as a uniform *standard of*

125. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 15 (1966).

126. *Id.* at 16 n.8.

patentability."¹²⁷ In *Alice*, the Supreme Court hinted at a qualitative assessment of whether a patent in practice amounts to significantly more than a patent upon an ineligible concept itself.¹²⁸ Thus, what I suggest is a more rigorous standard that is consistent with current Supreme Court precedent, one that focuses on common factors that might make an invention sufficiently 'non-generic.'

In *Alice*, the Court explicitly considered that "improv[ing] the functioning for the computer" or "improv[ing] any other technology"¹²⁹ would have lent to the patentability of a computer program. How one can extrapolate this principle more generally is uncertain. Clearly inventions that improve the *performance* of the computer improve the functioning, but there is absolutely no reason why software patents should be narrowly restricted to those that improve the performance of the computer. In fact, it is likely that very few software programs, which operate at the highest level of abstraction, are going to improve the performance of a computer at the hardware level.¹³⁰ Looking outside the four corners of the *Alice* opinion, we see there were at least two qualitative factors that influenced the Justices' opinion that the claimed invention was a generic application during oral argument. The first factor is the amount of time it would take to create and integrate the software into a system, and the second is the amount of skill required to implement the software.¹³¹ Other contributory, non-dispositive factors conceivably are:

- I. To what extent does the software improve the performance of the computer?
- II. To what extent is the computer running the software a 'generic computer,' i.e., what functions does the software provide that are unavailable to an ordinary computer?
- III. To what extent could well-known, conventional programming, analytical techniques, etc. be used to implement the claimed software?
- IV. To what extent is the software a simple automation of a previously manual process?

127. Giles S. Rich, *Laying the Ghost of the "Invention" Requirement*, in *NONOBVIOUSNESS: THE ULTIMATE CONDITION OF PATENTABILITY* 1:508 (J. Witherspoon ed., 1980) (emphasis in original).

128. See *Mayo*, 132 S. Ct. at 1294.

129. 134 S. Ct. at 2359.

130. See generally, *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 42-45 (D. Mass. 1990).

131. See Transcript of Oral Argument at 5, 12, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) (No. 13-298).

V. To what extent does the software solve a technological problem on a computer?¹³²

Though not an exhaustive list of considerations, these are suggested factors for evaluating whether a particular software patent is eligible for patentability under § 101.

More generally, the inquiry for whether a patent is an unpatentable “abstract idea” should start with resolving what the *underlying idea* of the patent is in the first place, before determining whether the subject matter is “directed to an ineligible category.”¹³³ Once there is a determination of the underlying idea, the test will vary depending on whether the idea contains a law of nature or naturally occurring substance. If not, it proceeds to the lower portion. See Fig. 2.

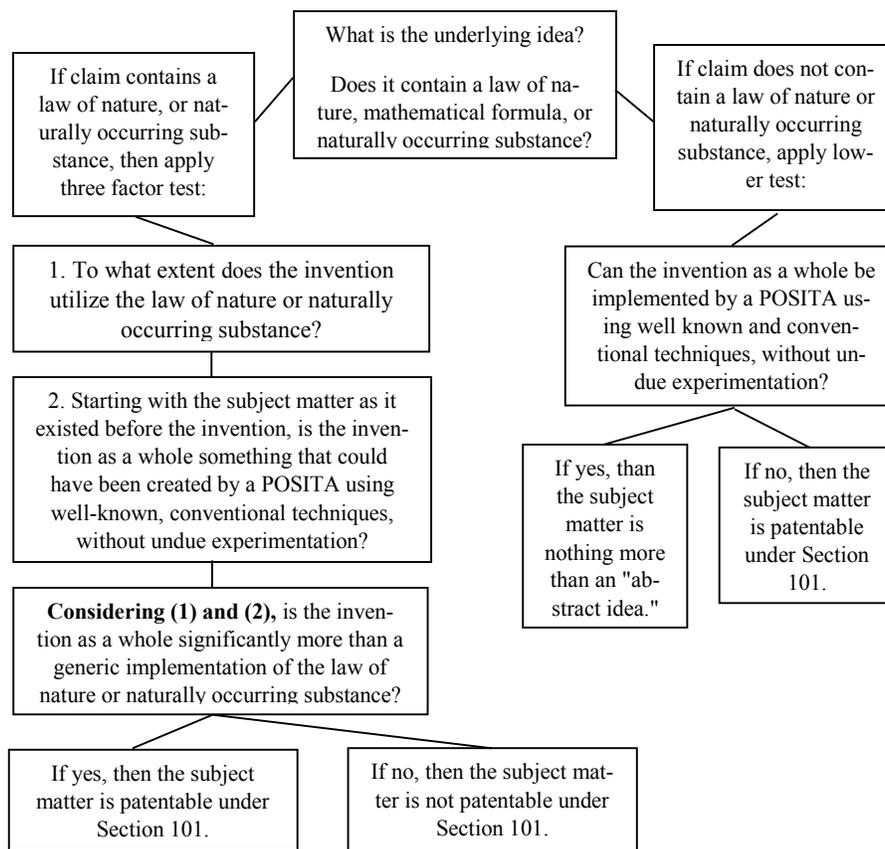


Fig. 2

132. See *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (2014), see also Pete Sadler, *Six Tips for Patenting Computer Games in Europe*, *MANAGING INTELLECTUAL PROP.*, Nov. 24, 2014, at 22.

133. *Alice*, 134 S. Ct. at 2355.

In the lower portion of Figure 2, the second step involves determining whether the invention as a whole could be implemented by a person of ordinary skill in the art (“POSITA”) using well known and conventional techniques, *without undue experimentation*. This “undue experimentation standard” borrows language from § 112, which is the test for whether a particular claim is enabled by the specification. In other words, if the invention is in a sense *self-enabling*, then the invention is nothing more than an “abstract idea.”

In the upper portion of Figure 2, there is a three factor test for when the patent claims a law of nature or naturally occurring substance:

1. To what extent does the invention utilize the law of nature or naturally occurring substance?
2. Analyzing the subject matter as it existed before the invention, is the invention as a whole something that could have been created by a POSITA using well-known, conventional techniques without undue experimentation?
3. Considering the analysis in the first two prongs, is the invention as a whole nothing more than a generic implementation of the law of nature or naturally occurring substance?

The upper portion of Figure 2 involves a careful weighing of the factors to determine whether the claimed subject matter is nothing more than a natural law or naturally occurring substance, using language from *Bilski*, *Mayo*, and *Alice*. This test is designed to be flexible and allow for some discretion, while providing bounds for a court to decide the eligibility of subject matter within a series of factors. While the test is not bright-line, it should create more certainty than available currently, where patentable subject matter is determined by the *ipse dixit* of the trial judge, examiner, or other reviewing party. Part V is a brief look at some recent developments to emphasize the need for a more rigorous approach.

V. RECENT DEVELOPMENTS

A. *Specter of Pre-1952 Case Law*

The *McRO* case is alluded to in Part II as it is emblematic of a line of cases that pose particularly problematic implications for software patents generally. A brief history of the cases preceding the 1952 Patent Act is discussed in Part III to illustrate some of the parallels with current decisions of our time. Most importantly, *McRO* illustrates the

struggle with applying current precedent and the confusion created by the ambiguous language used by the Supreme Court.

Recall the patent at issue in *McRO* was directed toward automatic lip synchronization and facial expression of three dimensional animated characters.¹³⁴ According to the court's explanation of the patents, the old method of moving animated lips required manually setting an appropriate "morph weight" to move the mouth a percentage of the way to a corresponding "morph target."¹³⁵ This process required the artist to manually sets the morph weights for each animation sequence—a process that was time consuming, tedious, and inaccurate.¹³⁶ Thus, the invention claimed in the patent at issue in *McRO* was a significant improvement on the prior art, because it rapidly increased animation time and reduced production costs.¹³⁷ However, the defendants in *McRO* averred that the animation method was merely a series of mathematical steps applied on computer.¹³⁸

In setting the legal framework in *McRO*, the trial court acknowledged that the Supreme Court cases are of "limited utility"¹³⁹ and chose to apply essentially a "one-step" transformation test, to see if the patent preempted all applications of an idea.¹⁴⁰ The court explained: "[a]t first blush, it is . . . difficult to see how the claims might implicate the basic underlying concern these patents tie up too much of future use of any abstract idea to which they apply."¹⁴¹ Following *Alice*, the court proceeded to break down each limitation in the claim to see what steps were present in the prior art, and which steps were novel without the aid of an expert or jury.¹⁴² The court declared that "where a claim recites *tangible* steps, but the only new part of the claim is an abstract idea, that may constitute a claim to an *abstract idea*."¹⁴³ In this case, the "inventive step" was the use of timing rules, but because the patentee attempted to preempt *any* rules that may develop, that left an "abstract idea at the point of novelty."¹⁴⁴ Not surprisingly, the specific "implementation" of the rules was not specified by the claims, but in the latter

134. *McRO*, 2014 U.S. Dist. LEXIS 135152 at *4.

135. *Id.* at *6.

136. *Id.*

137. *Id.*

138. *Id.* at *7.

139. *Id.* at *13

140. *Id.* at *12, *19.

141. *Id.* at *23 (internal quotation marks omitted).

142. *Id.* at *26.

143. *Id.* at *25 (emphasis added).

144. *Id.* at *32.

half of the specification.¹⁴⁵ Nonetheless, the court concluded that the “novel portions of [the] invention are claimed too broadly” because the claims were directed to all uses of “timing rules” rather than to a “particular implementation that is not specified by the claims.”¹⁴⁶

There are multiple problems with this analysis. First, the enactment of § 112 accomplishes the function of requiring the applicant to “particularly point[] out and distinctly claim[] the subject matter...” Second, § 112’s written description and enablement requirements are typically what limit the patentee’s broad claiming of a particular genus.¹⁴⁷ The trial court’s opinion anticipates this objection:

Scholars have argued that the written description and enablement doctrines of § 112 . . . do not adequately prevent unwarranted obstructions to follow-on innovation, and have urged that § 101 can and should do so. See, e.g., Lemley et al., *Life After Bilski*, 63 *Stan. L. Rev.* 1315, 1330 (2011) (cited in *Mayo*, 132 S. Ct. at 1301-03, 1304); but see Lemley, *Point of Novelty*, 105 *Nw. U. L. Rev.* 1253, 1279 (2011) (“[T]here is good reason to worry about overbroad patent claims that lock up a wide swath of potential future applications. But the *enablement and written description doctrines largely address that concern.*”).¹⁴⁸

Even under its own logic, the court in *McRO* should have taken into consideration that § 101 need not be expanded when § 112 can clearly limit the overbroad claiming of the “timing rules[;]” the inventor has failed to distinctly claim those rules, had not enabled the use of all rules in the specification, or had otherwise failed to provide sufficient written description to show that he is in possession of the genus of “timing rules.”¹⁴⁹

The most troubling aspect of the trial court’s opinion in *McRO* was its reliance on *Gen. Elec. Co. v. Wabash Appliance Corp.*, a pre-1952 decision whose logic regarding functional claiming was abrogated with the enactment of the 1952 Patent Act.¹⁵⁰ In fact, the court appeared to derive its new ‘insight’ on how to apply *Alice* almost entirely from this obsolete Supreme Court precedent: “This . . . analysis [from *Alice*]

145. See United States Patent No. 6,307,576 (filed Oct. 23, 2001).

146. *McRO*, 2014 U.S. Dist. LEXIS 135152 at *32, *34, *38.

147. See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1347 (Fed. Cir. 2010) (“Claims define and circumscribe, the written description discloses and teaches.”)

148. *McRO*, 2014 U.S. Dist. LEXIS 135152 at *17 (emphasis added).

149. Any claim that uses purely functional language, or covers a broad genus without sufficient supporting examples, will not be enabled. See, e.g., *In re Vaeck*, 947 F.2d 488, 495–96 (Fed. Cir. 1991) (affirming enablement rejection of genus claims).

150. 304 U.S. 364, 371 (1938), see Mark A. Lemley, *Address: Robert W. Kastenmeier Lecture Software Patents and the Return of Functional Claiming*, 2013 *Wis. L. Rev.* 905, 907 (2013), available at <https://web.stanford.edu/dept/law/ipsc/Paper%20PDF/Lemley,%20Mark%20-%20Paper.pdf>.

tracks the law's long-standing concern with patents that consist of old material with the addition of a new, but abstract, idea: 'the vice of a functional claim exists . . . when the inventor is painstaking when he recites what has already been seen, and then uses conveniently functional language at the exact point of novelty.'¹⁵¹ The 1952 Patent Act created 35 U.S.C. § 112 (paragraph 6) to allow for claim language to be "expressed as a means or step for performing a specified function *without the recital of structure, material, or acts in support thereof*," provided that its specification provides the "corresponding structure, material, or acts. . ."¹⁵² Thus, whether or not a claim uses functional language at the point of novelty is *irrelevant*, what matters is whether there are "structures. . .[etc.]" recited in the specification which satisfy the requirements of § 112 (enablement, written description, etc.) and other statutory sections.

The *McRO* decision reflects the confusion of courts in applying *Alice*. Left without a standard of determining whether a patent is directed to an "abstract idea," courts inevitably search for clues in the graveyards of legal jurisprudence, only to dig up obsolete and long-rejected notions of patentability. The court in *McRO* could have benefited from a more structured analysis into whether the claims, construed in light of the specification, were more than a generic implementation of automated lip syncing using timing rules. The court should have stressed, for instance, that the invention did in fact improve the performance of the computer because it increased the processing speed for animation of three dimensional characters. The court ultimately should have inquired into how difficult it would be for a POSITA to implement the underlying idea of automated lip syncing rather than dismissing the case without any factual basis. Instead, the court in *McRO* made a superficial determination that the patent in suit was overly broad, relying only on its elementary knowledge of computer science and completely disregarding the distinct functions of the various sections of the Patent Act.

B. Ultramercial – Dawn of a New Era?

Ultramercial, Inc. v. Hulu LLC., one of the first cases by the CAFC to follow *Alice* is likely a signal to the Supreme Court that the CAFC intends to use § 101 as a tool for resolving patentable subject matter at

151. See *McRO*, 2014 U.S. Dist. LEXIS 135152 at *25 (quoting *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 371 (1938)).

152. See 35 U.S.C. § 112 (2012).

the outset.¹⁵³ *Ultramercial* was brought to the CAFC for the third time after the Supreme Court had granted, vacated, and remanded the case following *Mayo*, and again after *Alice*.¹⁵⁴ The politics of this situation are not complicated; with Chief Judge Rader gone, and having been reversed six times in one term, the CAFC's era of intransigence may have come to an end. Despite its reservations, it appears that the CAFC plans to follow the Supreme Court § 101 precedent.¹⁵⁵

In *Ultramercial*, the CAFC adopted the district court's determination of the underlying abstract idea of the patent that an advertisement can be used as an exchange or currency.¹⁵⁶ The first claim at issue specifically included eleven steps for displaying an advertisement in exchange for access to copyrighted content.¹⁵⁷ The court held that "[t]his ordered combination of steps recites an abstraction—an idea, having no particular concrete or tangible form."¹⁵⁸ Other than a few comments about the idiosyncratic features of the program itself, the first half of the opinion appears to be nothing more than a cut-and-paste of *Alice* into the opinion: "A claim that recites an abstract idea must include 'additional features' . . . [a]dding routine additional steps such as updating an activity log, requiring a request from the consumer to view the ad . . . [other steps of process] . . . does not transform an otherwise abstract idea into patent-eligible subject matter."¹⁵⁹

In the second half of the opinion, the CAFC applied a nuanced version of its old "machine-or-transformation test," recalling that the Supreme Court said that the test is a "useful clue."¹⁶⁰ For the machine prong, the CAFC decided that the claims of the patent were "not tied to any particular novel machine or apparatus, only a general purpose computer" due to recitation of conventional elements.¹⁶¹ The court did not explain, for instance, why a general purpose computer is not a machine, or why the particular elements mentioned were conventional. The court concluded that transformation from the use on a computer is

153. 772 F.3d 709, 713 (Fed. Cir. 2014).

154. *Id.*

155. *But see* *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (2014) (upholding a patent directed toward pop-up advertisements that produce a page that retains the host website's look and feel, the court the patent valid and distinguished *Ultramercial* on the basis the patent solved a technical problem that "specifically ar[ose] in realm of computer networks" and that the solution "is necessarily rooted in computer technology").

156. *Ultramercial*, 772 F.3d at 714 (quoting *Ultramercial, LLC v. Hulu, LLC*, 2010 U.S. Dist. LEXIS 93453 at *17 (C.D. Cal. Aug. 13, 2013)).

157. *Ultramercial*, 772 F.3d at 714.

158. *Id.* at 715.

159. *Id.* at 715-16.

160. *Id.* at 716 (quoting *Bilski v. Kappos*, 561 U.S. 593, 603 (2010)).

161. *Ultramercial*, 772 F.3d at 716.

insufficient because it is “merely what computers do and does not change the analysis.”¹⁶² However, the claim in *Ultramercial* involving data manipulation in exchange for electronic payment is no less transformative than Morse’s system of electronic communication which produced “intelligible characters, signs, or letters”¹⁶³

For the transformation prong, the CAFC held that the claim at issue, “a transaction involving the grant of permission and viewing of an advertisement by the consumer, the grant of access by the content provider and the exchange of money between the sponsor and content provider[]” is insufficient because the abstractions in the claim are not representative of physical objects or substances.¹⁶⁴ The CAFC stated generally that transformations involving manipulations of “public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances.”¹⁶⁵ There are two problems with this syllogism. The first problem is the court’s assertion that elements of the claim are not representative of physical objects. Such interactions in the claimed process are in fact necessarily tied to concrete interactions. The grant of access (for the “preferred embodiment”) involves sending electronic signals over a telecommunications network and exhibiting a message to the consumer.¹⁶⁶ And though the exchange of money may occur electronically, it is no less physical than one’s bank account balance viewed through an online bank service. Second, even if the transactions are somehow not tied to physical objects, there is no reason that a transformation needs to be tied to a particular “physical object[] or substance[]” rather than a “relationship” or other such abstraction such as business risk.

“[A] process may be patentable, irrespective of the particular form of the instrumentalities used.”¹⁶⁷ A transformation may occur for relationships between one or more physical objects, for example, and these relationships may be manipulated in various steps of a process. “A machine is a thing. A process is an act, or a mode of acting. The one is visi-

162. *Id.* at 717.

163. *O’Reilly v. Morse*, 56 U.S. 62, 112 (1853) (internal quotations omitted), *see Mackay Radio & Tel. Co. v. Radio Corp. of America*, 306 U.S. 86, 91 (1939) (finding no infringement but upholding a patent on an “antenna system utilizing standing wave phenomena”).

164. *Ultramercial*, 772 F.3d at 717.

165. *Id.* at 717 (quoting *In re Bilski*, 545 F.3d 943, 963 (2008)).

166. *Method and System for Payment of Intellectual Property Royalties by Interposed Sponsor on Behalf of Consumer over a Telecommunications Network*, U.S. Patent No. 7,346,545, col. 4, line 36 (filed May 29, 2001).

167. *Cochrane v. Deener*, 94 U.S. 780, 788 (1876).

ble to the eye,—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed. Either may be the means of producing a useful result.”¹⁶⁸ Manipulating macroscopic quantities, such as business risk, may be a “conception of the mind” but can still produce a “useful result[]” within the meaning of the Patent Act.¹⁶⁹ Other macroscopic quantities, such as temperature and pressure, for example, describe relationships between the many atoms in a given sample.¹⁷⁰ A “business risk” as a macroscopic economic quantity similarly represents a perception of the relationships between individual people in an economic system, and is no less an abstraction than temperature and pressure, and thus should not be categorically barred from making a patentable transformation.

While the court stressed that not “all claims in all software-based patents will necessarily be directed to an abstract idea[,]”¹⁷¹ the CAFC’s lack of rigor in tailoring the analysis specifically to the patent at issue will most likely cause great difficulty for software claims to overcome § 101. A court following *Ultramercial* could easily apply the aforementioned analysis to any computer software patent by picking apart elements that are individually “well-known” or “conventional” and then declare that the software as a whole is merely an abstract idea. Business method patents are particularly at risk, because many of them involve manipulations of public or private legal obligations, which the CAFC regards as mere unpatentable “abstractions.”¹⁷²

Even more troubling is the procedural posture. In *Ultramercial*, the CAFC adjudicated the § 101 issue on a motion to dismiss under Fed. R. Civ. P. 12(b)(6), without any regard for the presumption of validity.¹⁷³ By being able to decide the question of patentable subject matter at the outset of a case, courts may inject their personal views into determining which patents should and should not issue without making a single factual finding and without any structured analysis. Beyond mere subjectivity, there are other compelling reasons to doubt the efficacy of using § 101 as a gateway for patentability. *Ex ante*, it is difficult,

168. *Tilghman v. Proctor*, 102 U.S. 707, 728 (1881).

169. *Id.*, see *Bilski*, 561 U.S. at 609 (“the Patent Act leaves open the possibility that there are at least some business methods that are within patentable subject matter under § 101.”)

170. Harvey Gould and Jan Tobochnik, *STATISTICAL AND THERMAL PHYSICS: WITH COMPUTER APPLICATIONS*, 1, (1st ed., 2010), available at <http://press.princeton.edu/chapters/s9375.pdf>. In *Tilghman*, the Court upheld claims directed to a particular method of bringing fatty elements and water into a desired chemical union at high temperature and pressure. 102 U.S. at 729.

171. *Ultramercial*, 772 F.3d at 715.

172. *Id.* at 717.

173. *Id.* at 717 (Mayer, J., concurring) (“no presumption of eligibility attends the section 101 inquiry”).

if not impossible, for a court of limited expertise in computer science to determine without claim construction, expert testimony, and other evidentiary proceedings what sort of software patents might successfully transform a general purpose computer into one that passes muster under § 101. Moreover, the Supreme Court has provided only a handful of examples of technological elements that are *insufficient* to add an “inventive concept,” and gives no indication of what technological elements might be sufficient.¹⁷⁴

Additionally, the concurring opinion in *Ultramercial* strongly reflects the CAFC’s intent to resolve subject matter eligibility at the outset of a case in order to provide courts with a lethal weapon to mitigate the ‘patent troll’ problem and protect the public.¹⁷⁵ Nevertheless, the majority opinion is conspicuously bereft of any useful guiding principles for courts to distinguish meritorious patents and broad, vacuous patents typically asserted by patent trolls. There can be no doubt that the approach taken in *Ultramercial* might curb assertion of the kind of patents that are possessed by patent trolls in large portfolios because of the expediency with which a court can dispose of the suit. However, under the guise of searching for an “inventive concept,” judges may be free to “decide the controlling factor according to [their] personal philosophy of what inventions shouldn’t be patented, whether or not [they have] any competence to do so or any knowledge of the patent system as an operative socioeconomic force.”¹⁷⁶ In today’s world, without a principled way to separate patents that are the product of innovation and contribute meaningfully to the “Progress of Science and useful Arts” from the patents that do not, courts will harm not only patent trolls, but also small companies who rely on the patent system to compete against larger companies.¹⁷⁷

174. *Id.* at 716.

175. See *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 719 (2014) (Mayer, J., concurring) (“Addressing section 101 at the threshold will thwart attempts—some of which bear the indicia of extortion . . . to extract ‘nuisance value’ settlements from accused infringers” (internal citations and quotation marks omitted)).

176. Giles S. Rich, *The Vague Concept of “Invention” as Replaced by Section 103 of the Patent Act*, in *NONOBVIOUSNESS: THE ULTIMATE CONDITION OF PATENTABILITY* 1-409 (John Witherspoon ed., 1980).

177. U.S. CONST. art. I, § 8, cl. 8.

VI. CONCLUSION

The Supreme Court has been less than precise in delineating the ineligible categories of patentable subject matter. The question of patentability has never been more uncertain, at least not since before the 1952 Patent Act was enacted. Predictability is imperative in ensuring that the patent system remains an integral part of business economics and continues to act as a powerful legal force to incentivize research and development. The Court's "inventive application" requirement could potentially make all patent claims vulnerable to challenge under § 101, whether or not the patentee has created an invention "worth to the public the embarrassment of an exclusive patent."¹⁷⁸ Pertaining to software, the specter of invalidation under § 101 looms large, and gives trial courts the opportunity to summon it upon a whim and defeat patents without trial, without expert testimony, without objective considerations of a patent's merit, nor any regard for the patent as an economic tool for promoting innovation. The Court's most recent decision, *Alice*, created an unworkable and nonsensical "two-part test," one that belied the Court's true reasoning why the software at issue was merely a "generic implementation" of the abstract idea of mitigating settlement risk. Looking beyond the Court's opinion in *Alice*, courts at all levels could benefit from using a more rigorous, qualitative test in determining whether a patent is directed to one of the ineligible categories of patentable subject matter. On such test, self-enablement, can be structured from the Court's current case law, and can limit the broad range of software patents left vulnerable under current § 101 jurisprudence. Regardless of whether a test for patentable subject matter is fashioned through judicial or legislative means, only through the use of principled decision-making will courts be able to maintain the integrity of the patent system.

178. Thomas Jefferson, The Founders' Constitution, Volume 3, Article 1, Section 8, Clause 8, Document 12, available at http://press-pubs.uchicago.edu/founders/documents/a1_8_8s12.html.