CHALLENGING SUBJECT-MATTER ELIGIBILITY IN PATENT LITIGATION

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CHAPTER 1

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Tom focuses his practice on IP litigation, with an emphasis in patent and trade secret litigation. Prior to becoming a lawyer, he worked for Amoco as a chemical manufacturing engineer and for Reichhold Chemicals as a senior plant engineer. By education, he is a chemical engineer.

Tom writes and speaks frequently on IP issues. His publications have addressed preparation for defending patent infringement suits, challenging inventorship in patent litigation, the practice of reverse engineering in compliance with the Digital Millennium Copyright Act, software and business method patents, patent reexamination, the rights of employee-inventors in the U.S. and abroad, fair use in copyright law, and other topics. He has spoken extensively on patent law, trade secrets law, and copyright law, as well as on IP litigation in the oil and gas industry.

Representative Experience

- *Illinois Tool Works v. Independent Ink.* Authored an amicus curiae brief for a case that involved IP and antitrust law on behalf of the Houston Intellectual Property Law Association in the U.S. Supreme Court.
- *Microsoft Corp v. AT&T Corp.* Co-authored a U.S. Supreme Court amicus brief involving the application of 35 U.S.C. § 271(f) to software components of patented products.
- Represented oilfield services companies in several patent infringement cases involving drilling technology, blowout preventers, and casing exit systems.
- Represented companies in several other industries, such as process control systems, internet telephony services, and gift card processing, in patent infringement cases.
- Argued at three *Markman* hearings.
- Obtained a pay-nothing dismissal with prejudice (pre-*Markman*) for an oilfield defendant in the Eastern District of Texas.

Professional Honors and Affiliations

- Texas Rising Star, 2010-2012, *Texas Monthly Magazine*
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I. SCOPE OF ARTICLE

The scope of this article is to highlight for the reader the explosion in recent years of jurisprudence relating to analysis of patent claims to determine whether they are directed to patentable subject matter—in other words, whether the subject of the patent claims is the kind of invention that patent law is designed to protect. The article identifies the pertinent statute, 35 U.S.C. §101, and the key judicially-created exceptions. Because no bright-line test for patentability exists, these cases typically are resolved with particular attention to the language of the specific claims at issue, and examination of the claim language and logic of prior precedent. Because the Supreme Court recently has been very active in this area, the article counsels that the best approach is to thoroughly understand the most significant Section 101 decisions issued by the Supreme Court, and gives the reader a tour of the most important cases in this area from the days of the telegraph and telephone to modern era of patents directed to business methods and other less tangible technology. The article then provides practical advice for litigators evaluating a possible subject matter challenge to a patent in suit.

II. THE BASICS: THE STATUTE, ITS EXCEPTIONS, AND THE CURRENT DILEMMA

A. The statute: 35 U.S.C. § 101

Patentable subject matter is defined in the Patent Act in Section 101, which states:

> 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.[1]

The foregoing is drawn nearly word-for-word from the Patent Act of 1793, authored by Thomas Jefferson—"the first administrator of our patent system"[2]—which defined patentable subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]."[3] The most recent codification of the patent laws in 1952 left Jefferson's language largely intact, replacing only "art" with "process."[4]

B. The key judicially-created exceptions: Laws of Nature, Mental Processes, and Abstract Ideas

Since 1853,[5] courts have identified and enforced three important exceptions to the broad definition of patentable subject matter. "Laws of nature, natural phenomena, and abstract ideas are not patentable."[6] As the Supreme Court has explained:

> A new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not have patented his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are manifestations of . . . nature, free to all men and reserved exclusively to none.[7]

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1 35 U.S.C. § 101.

2 *Bilski v. Kappos*, 130 S.Ct. 3218, 3245 (2010) (Stevens, J., dissenting).

3 Act of Feb. 21, 1793, § 1, 1 Stat. 319, as quoted in *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980). "The Act embodied Jefferson's philosophy that 'ingenuity should receive a liberal encouragement.'" *Chakrabarty*, 447 U.S. at 308-09, quoting 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871).

The Supreme Court's recent *Bilski* decision offers contrasting views of Jefferson's affinity for patents. The majority opinion, like the *Chakrabarty* decision, draws from Jefferson's writings on the importance of "liberal[ly] encourage[ing" ingenuity. *Bilski v. Kappos*, 130 S.Ct. 3218, 3225 (2010). The dissent, however, describes him as "[a] skeptic of patents" who "saw clearly the difficulty of deciding what should be patentable," a process the dissent quotes Jefferson as "describ[ing] . . . as 'drawing a line between things which are worth to the public the embarrassment of a patent, and those which are not." *Id*. at 3245 & n.32 (Stevens, J., dissenting) (quoting 13 Writings of Thomas Jefferson 335 (Memorial ed. 1904)).

4 *Chakrabarty*, 447 U.S. at 309.

5 *See Le Roy v. Tatham*, 14 L.Ed. 367 (1853). As the Supreme Court recently noted, "these exceptions have defined the reach of [Section 101] as a matter of statutory *stare decisis* going back 150 years." *Bilski v. Kappos*, 130 S.Ct. 3218, 3225 (2010), citing *Tatham*.

6 *Mayo Collaborative Services v. Prometheus Labs., Inc.*, 132 S.Ct. 1289, 1293 (2012), quoting *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

7 *Chakrabarty*, 447 U.S. at 309. The *Chakrabarty* Court upheld as patentable a live, human-made microorganism—a genetically engineered bacterium capable of breaking down multiple components of crude oil—on the grounds that the claimed invention "is not . . . a hitherto unknown natural phenomenon,

Furthermore, laws of nature and natural phenomena, in addition to being "free to all and reserved exclusively to none," have always existed even before their discovery. Thus, for Section 101 purposes, the discovery of a scientific principle merely "reveals a relationship that has always existed," and such discoveries "are not the kind of 'discoveries' that the statute was enacted to protect."[8] The "mere recognition of a theretofore existing phenomenon or relationship carries with it no rights to exclude others from its enjoyment . . . [because] the public must not be deprived of any rights that it theretofore freely enjoyed."[9]

Additionally, the Court has noted, these three exceptions—laws of nature, mental processes, and abstract ideas—represent "'the basic tools of scientific and technological work.' And monopolization of those tools through the grant of a patent right might tend to impede innovation more than it would tend to promote it."[10]

Thus, in *O'Reilly v. Morse*, a broad patent claim on the use of electromagnetism to produce writing at a distant location, by any process and with any equipment, was struck down by the Supreme Court as being directed merely to an unpatentable law of nature.[11] And in *CyberSource Corp. v. Retail Decisions, Inc.*, a patent on a method for detecting credit card fraud based on information relating past transactions to a particular internet address was held by the Federal Circuit to violate Section 101 as claiming an unpatentable mental process.[12] And in *Rubber-Tip Pencil Co. v.*, the Supreme Court held unpatentable a patent on a pencil containing a rubber eraser, as merely an abstract idea.[13]

C. The dilemma: How broad must a claim be to fall into an exception?

Yet, the contours of these three exceptions are not defined by a bright line. "[A]ll inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."[14] "A process is not unpatentable simply because it contains a law of nature or a mathematical algorithm."[15] To the contrary, "an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."[16] The more concretely defined the claims, the less uncertainty exists. When dealing with increasingly broad claims, absent a bright-line test for each of the three exceptions, the safest analysis may be made by comparing the claims at issue to prior Section 101 decisions by the Supreme Court, and asking whether the claims-in-suit are more statutory than those in cases upholding the claims against a Section 101 challenge, or whether the claims-in-suit seem similar or less statutory those in cases featuring a successful Section 101 challenge.

D. From *Tatham* to *Mayo*: The Supreme Court's Section 101 Jurisprudence

Since deciding *Le Roy v. Tatham* in 1852, the Supreme Court has run its Section 101 rule over numerous patents, upholding some and invalidating others. Since the Supreme Court represents the final word on whether a patent survives under Section 101, and since the Court has declined to issue bright line rules in this area, the specific facts and holdings of the Court's cases in this area provide the closest thing to reliable guidance that lower courts and practitioners can rely on.

1. The Court of Exchequer's decision in *Neilson v. Harford*: influential precedent.

Neilson had discovered that preheating the air used for combustion in a furnace, before the air entered the combustion chamber, increased the efficiency of the furnace operation.[17] He applied for a patent, describing generally "the manner in which the receptacle [used to preheat the air before entry into the combustion chamber] might be constructed and heated, and the air conducted through it to the fire: stating that the form of the receptacle was not material, nor the manner of applying heat to it."[18] He brought suit for infringement by defendant Harford, who challenged the patent's validity, arguing that "a patent for throwing hot air into the furnace, instead of cold, and thereby increasing the intensity of the heat,

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but . . . a nonnaturally occurring manufacture or composition of matter—a product of human ingenuity having a distinctive name, character and use." *Id*. at 309-10.

8 *Parker v. Flook*, 437 U.S. 584, 593 n.15 (1978).

9 *Id*.

10 *Mayo*, 132 S.Ct. at 1293 (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).

11 *O'Reilly v. Morse*, 56 U.S. 62, 117 (1853).

12 *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372 (Fed. Cir. 2011).

13 *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 506-07 (1874).

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

15 *Diehr*, 450 U.S. at 187, quoting *Flook*, 437 U.S. at 590.

16 *Diehr*, 450 U.S. at 187.

17 *Neilson v. Harford*, 151 Eng. Reports 1266 (Court of Exchequer Chamber 1841), discussed in *Morse*, 56 U.S. at 115-16.

18 *Neilson*, discussed in *Morse*, 56 U.S. at 115.

was a patent for a principle, and . . . a principle was not patentable."[19]

The Court of Exchequer candidly admitted that the question "at first created in the minds of the court much difficulty."[20] The court felt it solved the difficulty by considering the case "as if the principle being well known, the plaintiff had first invented a mode of applying it by a mechanical apparatus to furnaces, and his invention then consists in this: by interposing a receptacle for heated air between the blowing apparatus and the furnace."[21] Had the patent been construed by the Exchequer Court as covering only "the discovery that hot air would promote the ignition of fuel better than cold . . . the court, it appears, would have held [Neilson's] patent to be void, because the discovery of a principle in natural philosophy or physical science, is not patentable."[22]

2. *Tatham* to *Waxham*: Developing law relating to process patents.

Beginning with *Le Roy v. Tatham* in 1852, several cases involved patent claims directed to processes, in which the Court either dealt outright with a challenge that processes were unpatentable subject matter, or instead with the question whether a broad and often ambiguously drafted claim covered a process or a machine.

Le Roy v. Tatham*:* This case arose out of a suit for infringement of a patent on improved pipemaking machinery.[23] The improvement was made possible due to the inventors' discovery of a previously unknown property of lead, which they seized upon to make alterations in certain prior art machinery that fallen out of use in pipemaking.[24] The inventors' patent claimed "the combination of . . . the core and bridge or guide-piece, the chamber, and the die, when used to form pipes of metal, under heat and pressure, in the manner set forth, or in any other manner substantially the same."[25] The defendants alleged that the patent was invalid as not novel over several prior art references, which defense the trial court had rejected as "not material . . . because the originality did not consist in the novelty of the machinery, but in bringing a newly discovered principle into practical application, by which a useful article of manufacture is produced, and wrought pipe made as distinguished from cast pipe."[26] On appeal, the Supreme Court reversed, reading the patent's claims as drawn to the machinery, and as such that the question of the machinery's novelty was material and should have gone to the jury.[27] The Court disagreed with the trial court that the inventors had claimed the "newly discovered principle," and thus the question whether the use of the principle in pipe making was patentable subject matter was not in the case.[28]

O'Reilly v. Morse: This case, deemed a "landmark decision" by Justice Stevens over a century later,[29] was decided in 1853. Morse had obtained a patent in 1840, and a reissue patent in 1848, on the telegraph.[30] He brought suit for patent infringement against O'Reilly, who alleged that Morse's claims were invalid. The Supreme Court upheld the validity of the first seven of Morse's claims, but not the eighth, which read as follows:

> Eighth. I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specification and claims; the essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed for marking

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19 *Neilson*, discussed in *Morse*, 56 U.S. at 115.

20 *Neilson*, discussed in *Morse*, 56 U.S. at 115.

21 *Neilson*, discussed in *Morse*, 56 U.S. at 115. The *Morse* Court described the invention in this way: "[Neilson] had invented a mechanical apparatus, by which a current of hot air, instead of cold, could be thrown in. And this new method was protected by his patent. The interposition of a heated receptacle, in any form, was the novelty he invented." *Morse*, 56 U.S. at 116. "Whoever, therefore, used this method of throwing hot air into the furnace, used the process he had invented, and thereby infringed his patent, although the form of the receptacle or the mechanical arrangements for hearing it, might be different from those described the patentee." *Id*.

22 *See Morse*, 56 U.S. at 116 (stating the *Morse* Court's understanding of how the *Neilson* court would have ruled had it viewed the patent as covering only an idea).

23 *Le Roy v. Tatham*, 55 U.S. 156, 171 (1852).

24 *Id*. at 178-79 (Nelson, J., dissenting)(describing the background of the invention).

25 *Id*. at 176.

26 *Id*. at 174.

27 *Id*. at 176-77.

28 *Id*. at 177. Earlier, the Court had noted that "It is admitted, that a principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Id*. at 174-75.

29 *See Flook*, 98 S.Ct. at 2526 (Stevens, J.); *Diehr*, 101 S.Ct. at 1065 n.22 (Stevens, J., dissenting).

30 *O'Reilly v. Morse*, 56 U.S. 62, 108 (1853).

> 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.[31]

The breadth of the claim was clear: "It is impossible to misunderstand the extent of this claim. He claims the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing [of] intelligible characters, signs, or letters at a distance."[32] It would not matter, the Court recognized, what equipment was used, or what process was used; claim 8, if valid, entitled Morse to exclude such equipment or process, even if it relied on nothing expressly taught in his patent.[33]

Morse argued strongly that claim 8 was patentable under the Court of Exchequer's decision in *Neilson*,[34] but the Supreme Court disagreed. "If the Court of Exchequer had said that Neilson's patent was for the discovery, that hot air would promote ignition better than cold, and that he had an exclusive right to use it for that purpose, there might, perhaps, have been some reason to rely upon it. But the court emphatically denied this right to such a patent."[35] And in fact Morse's discovery differed importantly from Neilson's—whereas Neilson had discovered that heating air by any means and with any equipment before passing it into a furnace always improved the heat produced in the furnace, Morse had not discovered that electric current could always cause printing at some distant location, regardless of process or equipment.[36] Instead, Morse's discovery required certain equipment arranged in a certain way, and he was entitled to a patent on a process of printing using such arrangement, but was not entitled to a patent on a discovery that electric current, combined with any process or equipment, would result in printing, a discovery he had not made.[37]

The previous term's decision in *Le Roy v. Tatham* also required invalidating claim 8.[38]

Corning v. Burden: This decision issued in 1853, and required the Court to decide the propriety of a jury instruction that described the patent-in-suit as one to "a new process, mode, or method of converting puddler's balls into blooms, by continuous pressure and rotation of the ball between converging surfaces; thereby dispensing with the [equipment previously used for this purpose]. And the said letters patent secure to the patentee the exclusive right to construct, use, and vend any machine adapted to accomplish the objects of his invention as above specified, by the process, mode, or method above mentioned."[39] The Court reversed, finding that the patent claimed a machine. "The patent of Burden alleges no discovery of a new process, but only that he has invented a machine, and, therefore, correctly states the nature of his invention."[40] The Court further noted several instances in the patent's specification where it referenced the invention of a new machine.[41] Though Burden "after describing his machine, has set forth his claim in rather ambiguous and equivocal terms, which might be construed to mean either a process or machine[,]" the Court construed the patent on the whole as directed to the machine rather than method.[42]

Cochrane v. Deener: In the course of holding a patent on a process for making flour to be valid and infringed,[43] the Court described the characteristics of a patentable "process":

> A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or

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31 *Id*. at 112.

32 *Id.*

33 *Id*. at 113.

34 *Id.* at 114 (noting that this was the decision "most relied on, and pressed upon the court, in behalf of the patentee").

35 *Id*. at 116.

36 *Id*. at 116-17.

37 *Id*. at 117.

38 *Id*. at 117-18 (explaining that *Tatham* held that the patentee was not entitled to a patent on the newly discovered property of lead, but was entitled to patent a pipemaking process that used such principle, provided it was fully described in the patent's specification).

39 *Corning v. Burden*, 56 U.S. 252, 267 (1853).

40 *Id*. at 269.

41 *Id*.

42 *Id*. *But see* Michael Risch, "America's First Patents," 64 FLORIDA L. REV. 1279, 1292 (2012) (pointing to language in the patent-in-suit that would support a construction of the claims as covering a process not limited to a particular machine). "Despite the fact that it is cited [*e.g.*, in *Gottschalk v. Benson*] for its holding with respect to limitations on patentability, *Corning* was really about interpreting the patent, and it would surely be decided differently today." *Id*. at 1292-93.

43 *Cochrane v. Deener*, 94 U.S. 780, 791 (1876).

> patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.[44]

The Court's recitation of these characteristics of a patentable process seems intended less as an all-encompassing definition and more as support for its view that processes could be patentable apart from any requirement that they be performed on, or result in the introduction of, a new machine.[45] Nonetheless, the phrase "transform[ation] and reduc[tion] to a different state or thing" would catch the eye of Justice Douglas nearly one hundred years later, and feature prominently in the opinion he wrote for the Court in *Gottschalk v. Benson*: "Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."[46]

Tilghman v. Proctor: This 1880 decision upheld a patent to a process for manufacturing "fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure."[47] The Court extensively discussed the patentability of processes, reviewing the Court of Exchequer's decision in *Neilson*, and its own decision in *O'Reilly v. Morse*, and noting that "it has been supposed that the decision in *O'Reilly v. Morse* was adverse to patents for mere processes,"[48] a supposition it took pains to correct.[49] Citing the result in *Neilson*, and also to the patent obtained by Charles Goodyear on the process of vulcanizing rubber, the Court pronounced it beyond doubt that a patent could issue on a process.[50]

The Telephone Cases: These four decisions issued in 1888 turned on the scope of Claim 5 of Alexander Graham Bell's patent on the telephone, which claim read as follows:

> The method of and apparatus for transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth.[51]

The Court reviewed *O'Reilly v. Morse*, which it concisely summarized as standing for the principle that "the use of magnetism as a motive power, without regard to the particular process with which it was connected in the patent, could not be claimed, but . . . its use in that connection could."[52] Upholding Bell's claim was consistent with the *Morse* decision, the Court decided, because Bell had not claimed the use of electricity in processes other than the specific process taught by his patent.[53] And Bell's claim

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44 94 U.S. at 788.

45 Indeed, in *Bilski v. Kappos*, the majority opinion stated "recent cases . . . have rejected the broad [restrictive] implications of this dictum, and in all events, later authority shows that it was not intended to be an exhaustive or exclusive test." *Bilski*, 130 S.Ct. 3218, 3226 (2010) (citing *Benson*). Commentators earlier had reached similar conclusions. *See*, *e.g.*, Donald J. Chisum, "The Patentability of Algorithms," 47 U. PITT. L. REV. 959, 967 n.30 (1986) ("Taken in context, this judicial language was intended as an inclusive description, not a preclusive definition"); Alan L. Durham, "'Useful Arts' in the Information Age," 1999 BRIGHAM YOUNG UNIV. L. REV. 1419, 1468 (1999).

46 *Benson*, 93 S.Ct. 253, 256 (quoting *Cochrane*). The *Cochrane* opinion "has become famous for its definition of process." Samuel A. Oddi, "Regeneration in American Patent Law: Statutory Subject Matter," 46 IDEA 491, 521 (2006).

47 *Tilghman v. Proctor*, 102 U.S. 707, 709, 721, 734 (1880).

48 *Id*. at 726.

49 The Court explained *Morse*: "The eighth claim of Morse's patent was held to be invalid, because it was regarded by the court as being not for a process, but for a mere principle. . . . It was not a claim of any particular machinery, nor a claim of any particular process for utilizing the power [of electromagnetism], but a claim of the power itself, a claim put forward on the ground that the patentee was the first to discover that it *could* be thus employed. This claim the court held could not be sustained." *Id*. at 726-27.

50 *Id*. at 722 ("That a patent can be granted for a process, there can be no doubt. . . . A manufacturing process is clearly an art, within the meaning of the law.").

51 *The Telephone Cases*, 8 S.Ct. 778 (1888). As the Court emphasized later in the opinion, the claim was "*First*, for the process; and, *second*, for the apparatus," and as such, the patent was not limited to a particular type of apparatus, *e.g.*, "the magneto instrument" for use with the method. *Id*. at 783. Regarding claiming both a method and an apparatus in the same claim, the modern practice is to claim them separately. *See*, *e.g.*, *IPXL Holdings, LLC v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005) ("Because claim 25 recites both a system and the method for using that system, it does not apprise a person of ordinary skill in the art of its scope, and it is invalid under [35 U.S.C.] section 112, paragraph 2).

52 *The Telephone Cases*, 8 S.Ct. at 782.

53 *Id*.

remained patentable even if Bell's process was the only way by which electricity could be used to transmit speech—which as a practical matter would mean he had the exclusive patent on the use of electricity for speech transmission—such result was just, given that he had invented the process and disclosed it in his patent.[54] The boundary beyond which Bell could not, and did not, trespass would only have been claiming the use of electricity for a process different than the one he invented and taught.[55]

Expanded Metal Co. v. Bradford: This 1909 decision upheld a patent to an improved process for making sheet metal against a challenge that only *chemical* processes were patentable.[56] In view of *Cochrane v. Deener*, *The Telephone Cases*, and other cases where the Court had upheld mechanical process patents, the decision was an easy one.[57]

Waxham v. Smith: This 1935 decision involved a patent on an improved incubator, and method, for hatching eggs.[58] An infringement suit was brought, and the defendant challenged the patent's validity as purporting to cover "the application of the natural law that heat units flow from warm to cooler objects placed in proximity," because the invention relied on the fact that eggs in different stages of incubation have different temperatures, and further involved arranging the eggs within the incubator in a manner that made the most efficient use of this temperature differential, as well as applying a current of air under certain specific conditions.[59] Citing *Corning v. Burden* and *Cochrane v. Deener*, the Court found this an easy question, holding "[b]y the use of materials in a particular manner, [the inventor] secured the performance of the function [hatching eggs] by a means which had never occurred in nature and had not been anticipated by the prior art; this is a patentable method or process."[60]

Mackay Radio & Telegraph Co. v. Radio of America: This 1939 decision involved a suit alleging infringement of patent claims directed to a radio antenna configured and made by following a formula previously known in the art.[61] The Court's opinion was not concerned with Section 101, but did state in dicta, "While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."[62]

3. Rubber-Tip Pencil Co. and *Funk Bros.*: Invalidating product claims under §101.

Rubber-Tip Pencil Co. v. Howard: In this 1874 decision the Court held unpatentable a claim to a rubber eraser with a hollowed out portion, meant to be affixed to the end of a pencil.[63] "Everybody knew, when the patent was applied for, that if a solid substance was inserted into a cavity in a piece of rubber smaller than itself, the rubber would cling to it," and as such, the alleged invention could not be simply for a piece of rubber comprising a hole.[64] The Court thus concluded that the patentee could only have been seeking a patent on the *idea* of affixing such hollowed-out piece of rubber to the end of a pencil for use as an eraser.[65]

> An idea of itself is not patentable, but a new device by which it may be made practically useful is. The idea of this patentee was a good one, but his device to give it effect, though useful, was not new. Consequently, he took nothing by his patent.[66]

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54 *Id*.

55 *Id.*; *cf. Morse*, 56 U.S. at 117 (holding invalid Morse's eighth claim, which covered the use of electricity in connection with the telegraph, regardless of whether the equipment or process were taught by Morse).

56 *Expanded Metal Co. v. Bradford*, 29 S.Ct. 652, 657 (1909).

57 *Id*. at 657.

58 *Waxham v. Smith*, 55 S.Ct. 277, 278 (1935).

59 *Id*., 55 S.Ct. at 278.

60 *Id*.

61 *Mackay Radio & Telegraph Co. v. Radio Corp. of Am.*, 59 S.Ct. 427, 430-31 (1939).

62 *Mackay Radio*, 59 S.Ct. 427, 431. "While irrelevant to the resolution of the case before the Court, and supported by no citation of authority, this language marked a shift from earlier statutory-subject-matter cases. *Tilghman* required only that an applicant provide one practical process for using a scientific principle, whereas the dictum in *Mackay* laid the foundation for the Court's first general exclusion from patentable statutory subject matter: scientific principles." Max Stul Oppenheimer, "Patents 101: Patentable Subject Matter and Separation of Powers," 15 VANDERBILT J. OF ENT'MT & TECH. LAW 1, 18 (2012).

63 *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 506-07 (1874).

64 *Id*. at 507.

65 *Id*. ("What, therefore, is left for this patentee but the idea that if a pencil is inserted into a cavity in a piece of rubber smaller than itself the rubber will attach itself to the pencil, and when so attached become convenient for use as an eraser?")

66 *Id*.

"The legacy of *Rubber-Tip Pencil* is primarily this: it includes the convenient phrase '[a]n idea of itself is not patentable,' a phrase that enjoyed a rich after-life . . . in the twentieth century . . . [and] has been quoted, repeatedly, as authority to disallow patents to 'abstract ideas' in many guises."[67]

Funk Bros. Seed Co. v. Kalo Inoculant Co.: Product claims, rather than process claims, were at issue in this 1948 decision. The claims covered an inoculant for plants, which inoculant was made up of a mixed culture of a particular bacteria (Rhizobia), selected such that the multiple cultures comprising the mixture did not mutually inhibit each others' inoculative effects.[68] Before the inventor's discovery that such carefully selected cultures could be mixed without resulting in such mutual inhibition, few mixed culture inoculants existed, which required farmers to use separate inoculants for separate crops.[69] The discovery and subsequent sale of the mixed culture inoculants thus presented a cost savings to farmers and streamlined inventory issues for dealers as well.[70] When the patentholder sued a competitor for infringement, the trial court held the patent invalid "for want of invention."[71] The Seventh Circuit Court of Appeals reversed,[72] but the Supreme Court upheld the trial court's decision, deciding that the inventor merely had "aggregated" certain compatible species of bacteria, and that this did not rise to the level of invention required for patentability.[73] Even though the inventor was the first to recognize the feasibility and benefits of combining these species, nature's handiwork remained otherwise unaltered:

> Each of the species of root-nodule bacteria contained in the package infects the same group of leguminous plants which it always infected. No species acquires a different use. The combination of species produces no new bacteria, and no enlargement of the range of their utility. The bacteria perform in their natural way. Their use in combination does not improve in any way their natural functioning. They serve the ends nature originally provided and act quite independently of any effort of the patentee.[74]

In a concurring opinion, Justice Frankfurter highlighted something that the majority opinion had not emphasized, namely, that the claims at issue did not specify the combination of any particular strains, but rather, broadly encompassed otherwise unidentified bacteria strains hallmarked by their compatibility.[75] For Justice Frankfurter, had the particular bacteria strains been identified, claims to a package comprising them would have been patentable.[76]

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67 Alan L. Durham, "The Paradox of 'Abstract Ideas,'" 2011 UTAH L. REV. 797, 812 (2011).

68 *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 68 S.Ct. 440, 441 (1948). For example, claim 4 recited "An inoculant for leguminous plants comprising a plurality of selected mutually non-inhibitive strains of different species of bacteria of the genus Rhizobium, said strains being unaffected by each other in respect to their ability to fix nitrogen in the leguminous plant for which they are specific." *Id*. at 440 n.1.

69 *Id*. at 441.

70 *Id*. at 442. "These products were a prompt and substantial commercial success, filling a long-sought and important agricultural need." *Id*. at 444 (Burton, J., dissenting).

71 *Id*. at 440.

72 161 F.2d 981, 988 (7th Cir. 1947). The appellate court reasoned:

> As a result of [the inventor's] teachings, scientists learned how to make a composite inoculant without disastrous conflict of one species of bacteria with another. True, the composite inoculants had been thought of and practiced to some extent, but just as truly it had not achieved approved recognition. Indeed, scientists thought that it was a dangerous practice, and [inventor], for the first time, pointed out to the bacteriologist the fact of existing noninhibitive strains and instructed him that he should select such strains and make his composite inoculants of them. Thus he taught how to make a composite inoculant, successful, efficient and fulfilling the purpose it was meant to fill. This is not so-called 'aggregation.' It is inventive conception.

Id.

73 *Funk Bros. Seed Co.*, 68 S.Ct. at 441.

74 *Id*. at 442.

75 *Id*. at 443 (Frankfurter, J., concurring). Justice Frankfurter noted that the inventor "makes no claim that Funk Brothers used the same combination of strains that he found mutually compatible. He appears to claim that since he was the originator of the idea that there might be mutually compatible strains and had practically demonstrated that some such strains exist, everyone else is forbidden to use a combination of strains whether they are or are not identical with the combinations that [inventor] selected and packaged together." *Id*.

76 *Id*. at 443 (Frankfurter, J., concurring) ("Insofar as the court below concluded that the packaging of a particular mixture of compatible strains is an invention and as such patentable, I agree, provided not only that a new and useful property results from their

4. Benson, Flook, and Diehr: Section 101 and claims incorporating algorithms.

Gottschalk v. Benson: The claims at issue in this 1972 decision were directed to a method for converting binary-coded decimal numbers into pure binary numbers.[77] The claims "were not limited to any particular art or technology, to any particular apparatus of machinery, or to any particular end use [but rather, the claims] purported to cover any use of the claimed method in a general-purpose digital computer of any type."[78] The Patent Office had rejected the claims as directed to unpatentable mental processes, taking the view that "a programmable computer is merely a 'tool of the mind' and the method is basically 'mental' in character . . . because the 'workstuff' of the method is numbers which are mathematical abstractions."[79] However, the Court of Customs and Patent Appeals had upheld the claims as patentable, noting that "[c]ash registers, bookkeeping machines, and adding machines also work only with numbers but this has never been considered a ground for taking them out of the 'machine' category of section 101."[80] The Supreme Court unanimously reversed.

The Court's opinion was permeated by its concern for the broad, unbounded reach of the claims:

> Here the 'process' claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus.[81]

The Court then reviewed *Morse, The Telephone Cases*, and *Corning*, and emphasized that those decisions had analyzed whether or not the process claims at issue in each case were reasonably bounded.[82] The Court then reviewed several cases involving process claims that were not tied to a particular machine—akin to the claims at issue—and explained that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to patentability of a process claim that does not include particular machines."[83] However, the Court took pains to make clear the limits of its holding:

> It is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a 'different state or thing.' We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.[84]

The Court concluded that the unbounded claims at issue would, if allowed, amount to a patent on an idea. "The mathematical formula involved here has no substantial practical application except in connection with a digital computer [and if the claims were allowed] the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself."[85] As such, the claims were unpatentable, and the decision below was reversed.[86]

Parker v. Flook: Six years after *Benson*, the Court in *Flook* again considered the patentability of claims comprising a mathematical algorithm, but here the claims featured a specific use—updating an alarm limit on a process variable involved in a process for catalytic chemical conversion of hydrocarbons—plus additional method steps performed following solution of the algorithm.[87] Thus, unlike the claims in *Benson*, the claims in *Flook* "[did] not . . . cover every conceivable application of the formula."[88]

The path to the Supreme Court taken by the claims in *Flook* mirrored that of the claims in *Benson*—yet again, the Patent Office rejected the

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combination, but also that the particular strains are identifiable and adequately identified.").

77 *Gottschalk v. Benson*, 93 S.Ct. 253, 254 (1972).

78 *Id*. The Court added that "[t]he conversion of BCD numerals to pure binary numerals can be done mentally through the use of [a] table. The method sought to be patented varies the ordinary arithmetic steps a human would use by changing the order of the steps, changing the symbolism for writing the multiplier used in some steps, and by taking subtotals after each successive operation." *Id*. at 255.

79 *Application of Benson*, 441 F.2d 682, 686-88 (C.C.P.A. 1971).

80 *Id.* at 687.

81 *Gottschalk v. Benson*, 93 S.Ct. at 255.

82 *Id*. at 255-56.

83 *Id*. at 256-57 (quoting *Cochrane v. Deener*, and reviewing *Tilghman*, *Expanded Metal Co.*, and the companion cases *Smith v. Snow* and *Waxham v. Smith*).

84 *Id*. at 257.

85 *Id*. at 257.

86 *Id*. at 258.

87 *Parker v. Flook*, 98 S.Ct. 2522, 2524 (1978).

88 *Id*.

claims, only for the Court of Customs and Patent Appeals to reinstate them.[89] The appellate court read *Benson* as expressly limited to claims that "would wholly pre-empt the mathematical formula"—that is, where the sole act of solving the algorithm would infringe the claims.[90] Because that was not the case with the claims at issue, which contained additional steps apart from performance of the algorithm, the appellate court found that *Benson* did not bar patenting the claims.[91]

Once again, the Supreme Court reversed and held the claims invalid, though without the unanimity of the *Benson* decision.[92] The majority opinion first rejected the contention that post-solution activity—namely, updating or adjusting the alarm limit to the value computed through the use of the algorithm—could impart patentability to the claimed process.[93] The majority deemed this "exalt[ing] form over substance," and risked permitting a competent patent drafter to "attach some form of post-solution activity to almost any mathematical formula" and thereby create patentable claims.[94] Instead, the majority reached back through *Funk Bros.*, *MacKay Radio*, and *Morse* all the way to *Neilson v. Harford,* and held the proper approach was to treat the algorithm step as though it belonged to the prior art.[95] "Whether the algorithm was in fact known or unknown at the time of the claimed invention, as one of the 'basic tools of scientific and technological work,' it is treated as though it were a familiar part of the prior art."[96] Applying that reasoning here, the majority held the claimed process unpatentable because every other step in the process also was known at the time of the invention.[97] The majority thus saw the claim at issue as being for no more than an improvement to the known process of calculating alarm limits, the improvement being solely the use of an algorithm that the majority felt required to treat as though it also was known in the prior art.[98] "Very simply, our holding today is that a claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101."[99]

A concise dissent argued that a process should not become unpatentable simply because one step in the process—the algorithm—was unpatentable when considered in isolation.[100] The dissent further criticized the majority for importing into the Section 101 analysis "the criteria of novelty and inventiveness. Section 101 is concerned only with subject-matter patentability."[101]

Diamond v. Diehr: This case was decided in 1981, after the Court twice in the previous decade had held unpatentable process claims that comprised a step of solving a mathematical algorithm. The process claim in *Diehr* was directed to molding raw, uncured synthetic rubber into cured rubber products.[102] Though several steps of the process required the use of a mathematical formula in connection with a programmed digital computer,[103] a 5-4 majority[104] of

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89 *Application of Flook*, 559 F.2d 21, 22-23 (C.C.P.A. 1977).

90 *Id*. at 23.

91 *Id*.

92 *Parker v. Flook*, 98 S.Ct. at 2529.

93 *Id*. at 2525-26.

94 *Id*. at 2525.

95 *Id*. at 2526-27 (noting, inter alia, *Morse*'s reliance on *Neilson*'s holding that "the case must be considered as if the principle being well known, the plaintiff had first invented a mode of applying it").

96 *Id.* at 2526, quoting *Benson*, 93 S.Ct. at 255. The majority acknowledged the argument that its approach "improperly imports into § 101 the considerations of 'inventiveness' which are the proper concerns of §§ 102 and 103," but rejected the argument:

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

Id. at 2527-28. The majority opinion thus acknowledged that its approach involved consideration of inventiveness, but seemed to justify this as a proper element of considering the patentability of the claim as a whole. *See id*. The three-Justice dissent found this unsatisfactory, and would have preferred to keep the inventiveness analysis separate from the patentability analysis. *See id*. at 2530 (Stewart, J., dissenting).

97 *Id*. at 2528.

98 *Id*.

99 *Id*. at 2528 n.18.

100 *Id*. at 2530 (Stewart, J., dissenting). Justice Stewart was joined in dissent by Chief Justice Burger and Justice Rehnquist. *Id*. at 2529.

101 *Id*. at 2530.

102 *Diamond v. Diehr*, 101 S.Ct. 1048, 1052 (1981).

103 *Id*.

104 The four dissenters were Justices Stevens (author of the majority opinion in *Flook* three years earlier),

the Court found the claimed process constituted patentable subject matter.

The majority emphasized that a limitation in the state of the art prior to the claimed invention was the industry's inability to measure the accurately temperature inside the molding press, which led the industry to treat the internal temperature as an uncontrollable variable; as such, those in the industry estimated the proper time to open the molding press without regard to the internal temperature, with unsatisfactory results, typically leading to undercuring or overcuring.[105] The inventors used a thermocouple to continuously measure the internal temperature, which they continuously fed to a computer that used it to repeatedly recalculate the required cure time through the Arrhenius equation, which the industry long had used to calculate cure time.[106]

The majority viewed the claimed invention as the type of process that historically had been deemed acceptable subject matter under Section 101, emphasizing that it involved "the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing" and noting the steps in the process that involved physical equipment, such as "the loading of a mold with raw, uncured rubber and . . . opening . . . the press at the conclusion of the cure."[107] The majority distinguished *Benson* as standing only for the principle that "an algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent," and *Flook* as holding merely that "[a]n alarm limit is simply a number and . . . the applicant sought [merely] to protect a formula for computing this number."[108] Diehr's invention, in contrast, "employs a well known mathematical equation, but [does] not seek to pre-empt the use of that equation."[109] "Rather, [the inventors] seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process," which as the majority emphasized, involved several physical steps, e.g., installing rubber in a press, closing the mold, and the like.[110] Reaching back to *MacKay Radio*, the majority emphasized that "[w]hile a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."[111] Similarly, "Arrhenius' equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by §101."[112]

The four dissenting justices, in an opinion authored by Justice Stevens, read the claims differently than did the majority:

> As the Court reads the claims . . . the inventors' discovery is a method of constantly measuring the actual temperature inside a rubber molding press. As I read the claims, their discovery is an improved method of calculating the time that the mold should remain closed during the curing process. If the Court's reading of the claims were correct, I would agree that they disclose patentable subject matter. On the other hand, if the Court accepted my reading, I feel confident that the case would be decided differently.[113]

To the dissenters, the inventors had not discovered anything new about curing rubber. Rather, "they claim to have discovered . . . a method of updating the original estimated curing time by repetitively recalculating that time pursuant to a well-known mathematical formula in response to variations in temperature within the mold."[114] The dissent found the claimed "method of updating the curing time calculation strikingly reminiscent of the method of updating alarm limits that Dale Flook sought to patent" and as such, would have held it non-statutory under Section 101.[115]

Marshall, Brennan and Blackmun. *See id*. at 1060 (Stevens, J., dissenting).

105 *Id*. at 1052.

106 *See id*. at 1052-53 & 1052 n.2 (Arrhenius equation).

107 *Id*. at 1055.

108 *Id*. at 1056. The majority returned to these cases towards the end of the opinion:

> A mathematical formula as such is not accorded the protection of our patent laws, *Gottschalk v. Benson* . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment. *Parker v. Flook* . . . Similarly, insignificant post-solution activity will not transform an unpatentable principle into a patentable principle. *Ibid*.

Diehr, 101 S.Ct. at 1059.

109 *Id*. at 1057.

110 *Id*.

111 *Id*., citing *MacKay Radio*, 59 S.Ct. 427, 431 (1939).

112 *Id*.

113 *Id*. at 1067 (Stevens, J., dissenting).

114 *Id*. at 1068.

115 *Id*.

5. Bilski and *Mayo*: The Supreme Court's renewed interest in Section 101.

Bilski v. Kappos: The invention at issue in this 2010 decision was directed to a method of instructing buyers and sellers of commodities on how to protect, or hedge, against the risk of price fluctuations in the energy market.[116] However, the claimed invention never issued as a patent, but rather, was rejected by the Patent Office as (i) not implemented on a specific apparatus, and (ii) merely solving a pure math problem.[117] After affirmance by the Board of Patent Appeals and Interferences, the case proceeded to the Federal Circuit, which took it en banc and affirmed. The Federal Circuit's opinion was highly significant, because it rejected that court's previous benchmark for patentable processes—the "useful, concrete and tangible result" test from the 1998 *State Street Bank* decision[118]—and replaced it with the "machine or transformation test," which the appellate court deemed "the sole test governing § 101 analyses,"[119] and which it articulated by writing:

> A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.[120]

Though the Supreme Court affirmed the holding that the claims were unpatentable, it did so while clarifying and limiting the machine-or-transformation test. The Court first rejected the notion that the Federal Circuit's newly articulated test constituted the sole test for patentability under Section 101, holding that the term "process" should not be narrowly interpreted to confine it to a machine or require transformation of an article.[121] Instead, the Court characterized the test as "a useful and important clue, and investigative tool, for determining whether some claimed inventions are processes under § 101 . . . . [but] is not the sole test for deciding whether an invention is a patent-eligible 'process.'"[122]

The *Bilski* Court went on to address, and reject, the notion that business method patents were categorically unpatentable.[123] To the contrary, the Court expressly held that "'method' . . . may include at least some methods of doing business."[124] The Court recognized that "some business method patents raise special problems in terms of vagueness and suspect validity,"[125] but held that the "Patent Act leaves open the possibility that there are at least some processes that can be fairly described as business methods that are within patentable subject matter under § 101."[126]

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116 *Bilski v. Kappos*, 130 S.Ct. at 3223.

117 *Id*. at 3224.

118 *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

119 *In re Bilski*, 545 F.3d 943, 955-56 (Fed. Cir. 2008) (en banc). The Federal Circuit noted that the Supreme Court in *Benson* had explicitly stated that the machine-or-transformation test was *not* the *exclusive* test for patentability of a process. *Id*. at 956, citing *Benson*, 93 S.Ct. 253 at 257. However, the Federal Circuit decided that the Supreme Court's subsequent decisions in *Flook* and particularly *Diehr* had backed away from this assertion. *See id*. at 956 ("[the foregoing] caveat was *not repeated* in *Diehr* when the Court reaffirmed the machine-or-transformation test").

120 *Id.* at 954.

121 *Bilski v. Kappos*, 130 S.Ct. at 3226.

122 *Id*. at 3227. The Court noted that several amici curiae had identified "reasons to doubt whether the [machine-or-transformation] test should be the sole criterion for determining the patentability of inventions in the Information Age," due to concerns that such test would "create uncertainty as to the patentability of software, advanced diagnostic medicine techniques, and inventions based on linear programming, data compression, and the manipulation of digital signals." *Id*. Recognizing the possibility that "new technologies may call for new inquiries," the Court concluded that it was unduly restrictive to limit the patentability inquiry to the machine or transformation test. *Id*. at 3228.

123 *Id*. at 3228-29.

124 *Id*. at 3228 (citing, *inter alia*, the presence of "method" in the definition of "process" found in 35 U.S.C. § 100(b), along with the definition of "method" in Webster's New International Dictionary).

125 *Id*. at 3229. Writing for the majority of the Court, Justice Kennedy here cited his own opinion in *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 397 (Kennedy, J., concurring in vacating a Federal Circuit decision that applied an overly broad standard to support an award of permanent injunctive relief to a patentholder who had proven infringement at trial), where Justice Kennedy had written:

> In addition injunctive relief may have different consequences for the burgeoning number of patents over business methods, which were not of much economic and legal significance in earlier times. The potential vagueness and suspect validity of some of these patents may affect the calculus under the four-factor test [for awarding injunctive relief].

MercExchange, 547 U.S. at 397.

126 *Bilski v. Kappos*, 130 S.Ct. at 3229.

Turning finally to the claims in the patent application at issue, the Court held them unpatentable as claiming merely the abstract idea of risk hedging, both as a concept and as reduced to a mathematical formula.[127] Putting the case in historical perspective, the Court saw these claims as a weaker candidate for patentability than the unsuccessful claims in *Flook*, "for the *Flook* invention was at least directed to the narrower domain of signaling dangers in operating a catalytic converter."[128]

Mayo Collaborative Services v. Prometheus Labs.: In this 2012 decision, a unanimous Court invalidated patents directed to processes usable by physicians who used thiopurine drugs to treat patients with autoimmune diseases determine whether a particular dosage level was too low or too high. The patented processes applied recently discovered correlations between the concentration in the blood of certain metabolites and the likelihood that a drug dosage would be ineffective or result in harmful side effects. The patents were invalid, the Court held, because they did not "add *enough* to their statements of the correlations" to transform the claimed processes into "patent-eligible processes that *apply* natural laws."[129] The Court's holding rested on its determination that, apart from the newly discovered correlations, the remaining steps in the claimed processes were merely "well-understood, routine, conventional activity previously engaged in by researchers in the field."[130]

III. CHALLENGING SUBJECT-MATTER ELIGIBILITY IN LITIGATION

As a procedural matter, "[w]hether a patent claim is drawn to patent-eligible subject matter is an issue of law that is reviewed de novo."[131] A trial court may decide this issue at summary judgment,[132] and even on a motion to dismiss for failure to state a claim.[133] The trial court is not required to construe the claims before determining whether the claims cover patentable subject matter.[134]

A defendant evaluating challenging the claims of an asserted patent in litigation may find it beneficial to include in its calculus the following:

- **Patents granted while the *State Street Bank* test was in effect may be more vulnerable**

The Federal Circuit's decision in *State Street Bank*, issued on July 23, 1998, announced a "useful, concrete, and tangible result" test for patentable subject matter:

> Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete, and tangible result'—a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.[135]

State Street's holding that an apparatus for manipulating data according to an algorithm was patentable if it produced a useful, concrete and tangible result was extended to cover processes that used an algorithm to manipulate data in *AT&T Corp. v. Excel Comm'ns*.[136] The "useful, concrete and

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127 *Id*. at 3229-31.

128 *Id*. at 3231.

129 *Mayo*, 132 S.Ct. at 1297.

130 *Mayo*, 132 S.Ct. at 1294.

131 *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012).

132 *Dealertrack*, 674 F.3d at 1316 (noting that the trial court granted summary judgment of invalidity of three claims as being drawn to nonpatentable subject matter); *id*., 674 F.3d at 1335 (Plager, J., dissenting)(noting that the "trial court had before it several summary judgment motions, including one addressing §103 (obviousness), as well as one addressing §101 . . . [and] chose to decide the case under §101 rather than on the §103 issue.").

133 *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1325 (Fed. Cir. 2011) (noting that the trial court dismissed the plaintiff's claims for failure to state a claim, deciding—without first construing the patent's claims—that the claims were directed to nonstatutory subject matter), *vacated on other grounds sub nom WildTangent, Inc. v. Ultramercial, LLC*, 132 S.Ct. 2431 (May 21, 2012) (vacating and remanding to the Federal Circuit for further consideration in light of the Supreme Court's decision in *Mayo*).

134 *Ultramercial,* 657 F.3d at 1325 ("This court has never set forth a bright line rule requiring district courts to construe claims before determining subject matter eligibility. Indeed, because eligibility is a coarse gauge of the suitability of broad subject matter categories for patent protection, claim construction may not always be necessary for a §101 analysis.")(cites, quotes omitted), *vacated on other grounds sub nom WildTangent, Inc. v. Ultramercial, LLC*, 132 S.Ct. 2431 (May 21, 2012).

135 *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

136 *AT&T Corp. v. Excel Comm'ns*, *Inc*., 172 F.3d 1352, 1356 (Fed. Cir. 1999) ("Because §101 includes processes as a category of patentable subject matter,

tangible result" test remained the standard for more than ten years until it was withdrawn by the Federal Circuit in *In re Bilski* on October 30, 2008.[137] During the ten years the test was in effect, "[t]here can be little question . . . that the Federal Circuit's new practical utility standard dramatically changed the pre-existing legal standards to permit patenting of what previously belonged in the public domain."[138] Now, following the Federal Circuit's withdrawal of the test and the Supreme Court's decisions in *Bilski* and *Mayo*, with greater attention being paid to the machine-or-transformation test as a significant predictor of patentability, process claims patented during the *State Street-AT&T Corp*. era that neither were directed to either a machine nor transformed an article may be vulnerable to a Section 101 challenge.

- **Thoroughly ground a challenge in Supreme Court precedent, and incorporate Federal Circuit precedent where possible**

The Supreme Court's recent activity in this area has resulted in much shorter shelf lives for Federal Circuit decisions. Whereas the *Freeman-Walter-Abele* test for patentability of claims involving mathematical operations lasted about 16 years before being called into doubt by *State Street*,[139] and the "useful, concrete and tangible result" test of *State Street-AT&T Corp*. lasted ten years, the vitality of many recent Federal Circuit decisions has been decidedly shorter, not only for the *Bilski* and *Mayo* decisions criticized and reversed, respectively, by the Supreme Court,[140] but also for the other Federal Circuit decisions for which the Supreme Court has granted certiorari, vacated, and remanded for consideration in light of either *Bilski* or *Mayo*.[141] Moreover, in contrast to Supreme Court decisions that issue after having been considered by the full Court, most Federal Circuit decisions are authored by a three-judge panel, which creates the possibility of inconsistent results among cases having similar facts. As such, a defendant challenging a patent will benefit from thoroughly grounding the challenge in Supreme Court precedent, then taking care to incorporate Federal Circuit precedent into the analysis where it seems most applicable.

- **Consider holding the challenge in reserve until after the patentee has committed itself to broad claim constructions**

Though a subject-matter challenge may be brought even before claim construction,[142] it may be

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the judicially-defined proscription against patenting of a 'mathematical algorithm,' to the extent such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract.") (citing *State Street Bank* and *Benson*). In *AT&T Corp. v. Excel Comm'ns*, the Federal Circuit "took the decisive step of crossing the machine-process line and elevating the dicta about processes in *State Street Bank* into a holding." Donald R. Dunner and Richard L. Rainey, "Business Method Patents: Far From A Settled Issue," 3 SEDONA CONF. J. 57, 59 (2002).

137 *In re Bilski*, 545 F.3d 943, 955-56 (Fed. Cir. 2008) (en banc).

138 Donald R. Dunner and Richard L. Rainey, 3 SEDONA CONF. J at 60.

139 From the 1982 decision in *In re Abele*, 684 F.2d 902 (C.C. P.A. 1982) to the *State Street Bank* decision in 1998.

140 *Bilski* was decided by the Federal Circuit on October 30, 2008 (545 F.3d 943), after which the Supreme Court granted certiorari on June 1, 2009 (129 S.Ct. 2735) before affirming but criticizing on June 28, 2010 (130 S.Ct. 3218). *Mayo* initially was decided on Sept. 16, 2009 (581 F.3d 1336), then vacated by the Supreme Court on June 29, 2010 (130 S.Ct. 3543), then decided by the Federal Circuit on remand on December 17, 2010 (628 F.3d 1347), before the Supreme Court granted certiorari a second time on June 20, 2011 (131 S.Ct. 3027) and reversed on March 20, 2012 (132 S.Ct. 1289).

141 Consider for example the path taken by the *Myriad Genetics* case, which has been vacated once by the Supreme Court and recently was the subject of a grant of certiorari when at the Court a second time. *See*, *e.g.*, *Association for Molecular Pathology v. U.S. Patent & Trademark Office*, 653 F.3d 1329 (Fed. Cir. July 29, 2011), vacated and remanded without opinion in light of *Mayo* sub nom *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 132 S.Ct. 1794 (March 26, 2012); decision on remand, *Association for Molecular Pathology v. U.S. Patent & Trademark Office*, 689 F.3d 1303 (Fed. Cir. Aug. 16, 2012), certiorari granted in part sub nom *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S.Ct. 694 (Nov. 30, 2012).

Another example is *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1325 (Fed. Cir. 2011), *vacated sub nom WildTangent, Inc. v. Ultramercial, LLC*, 132 S.Ct. 2431 (May 21, 2012) (vacating and remanding to the Federal Circuit for further consideration in light of the Supreme Court's decision in *Mayo*).

142 *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1325 (Fed. Cir. 2011) (noting that the trial court dismissed the plaintiff's claims for failure to state a claim, deciding—without first construing the patent's claims—that the claims were directed to nonstatutory subject matter), *vacated on other grounds sub nom WildTangent, Inc. v. Ultramercial, LLC*, 132 S.Ct. 2431 (May 21, 2012); *see also OIP Technologies, Inc. v. Amazon.com*, *Inc*., 2012 WL 3985118, *1 (N.D. Cal. 2012) (granting motion of defendant to dismiss for failure to state a claim at Rule 12(b)(6) stage, after considering the parties' submissions and granting an

well to keep the challenge in reserve until the patentee has committed itself to specific claim constructions, either expressly in the form of proposed claim constructions presented and argued for in claim construction briefing, or implicitly in the form of infringement contentions. Raising the challenge earlier will alert the patentee of the need to stay within Supreme Court precedent when taking positions as to the scope of the claim, and could reduce the chances of a successful subject-matter challenge.

- **Recognize that some trial courts may be reluctant to decide the case on Section 101 grounds**

Case law pertaining to patentable subject matter increasingly is being referred to as a "murky morass." Indeed, Federal Circuit decisions issued before *Mayo* urged trial courts to refrain from deciding cases on Section 101 grounds and avoid "the swamp of verbiage that is §101"[143] and "the murky morass that is §101 jurisprudence."[144] However, after the Supreme Court clarified in *Mayo* that Section 101 is the threshold analysis for patent validity, and cautioned against shifting the patent-eligibility inquiry to Sections 102, 103 and 112 as "risk[ing] creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do."[145] As a result, some trial courts may be willing to consider a 12(b)(6) motion or a summary judgment motion premised on Section 101.[146] Time will tell if courts become increasingly amenable to Section 101 challenges, or if uncertainty about the undeniably fluid state of the law leads more courts to decline the invitation to apply Section 101 to end a case early.

IV. CONCLUSION

Significant attention is being paid to the standards governing the determination whether a patent is directed to patentable subject matter. The current state of the law is unsettled, presenting difficulties to all who practice in the field, including not only trial and appellate courts, but also patent attorneys and patent examiners. As discussed above, a significant body of Supreme Court case law exists from which key principles can be extracted, and comparisons may be made between the types of claims upheld or rejected by the Court, and the types of claims at issue in a particular lawsuit. Thoroughly understanding not only the holdings of these cases, but also their specific facts and the context of the era in which each was decided, will help the litigator plot the most direct path out of the "murky morass" of Section 101 and towards a successful application of subject matter eligibility.

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oral hearing, and deciding the patent covered non-statutory subject matter).

143 *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260 (Fed. Cir. 2012).

144 *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057, 1073-75 (Fed. Cir. 2011).

145 *Mayo*, 132 S.Ct. 1289, 1304 (2012).

146 *SmartGene, Inc. v. Advanced Biological Labs., SA*, 852 F.Supp.2d 42, 52 (D.D.C. 2012) (granting summary judgment that the claims were directed to nonstatutory subject matter).