
RETHINKING PATENTABLE SUBJECT MATTER: ARE STATUTORY CATEGORIES USEFUL?

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“The view that ‘there is nothing necessarily physical about ‘signals’ is incorrect.”

Arrhythmia Research Technology v. Corazonix (Fed. Cir. 1992)¹

“A transitory, propagating signal like Nuijten’s is not a ‘process, machine, manufacture, or composition of matter.’”

In re Nuijten (Fed. Cir. 2007)²

INTRODUCTION

When the 82nd Congress of the United States voted to amend the existing Patent Act, the Senate stated in its accompanying report that statutory subject matter (the types of inventions or discoveries eligible to receive patent protection) “may include anything under the sun that is made by man” so long as “the conditions of the title are fulfilled.”³ The “title” referred to in the Senate Report is Title 35 of the United States Code.⁴ Section 101 of Title 35 provides the scope of statutory subject matter; the “conditions” referred to in the aforementioned Senate Report are the additional requirements provided in subsequent sections of Title 35 which an invention must meet before the Patent Office will reward the inventor with a patent over his or her creation.⁵ These additional requirements include the formidable barriers of novelty, non-

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¹ *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1059 (Fed. Cir. 1992) (citing *In re Taner*, 681 F.2d 787, 790 (C.C.P.A. 1982)).

² *In re Nuijten*, 500 F.3d 1346, 1357 (Fed. Cir. 2007) (citing 35 U.S.C. § 101).

³ S.R. REP. NO. 82-1979 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2399.

⁴ 35 U.S.C. §§ 1 et seq. (2007).

⁵ S.R. REP. NO. 82-1979 (“A person may have ‘invented’ a machine or a manufacture . . . but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.”).

obviousness and enablement which a patent applicant must overcome in order to attain the status of patentee.⁶ Given the language employed by the Senate, it would seem that Congress intended all manner of inventions to fall within the ambit of the patent system, with the Patent Office using the more robust statutory requirements of novelty, non-obviousness and adequate disclosure as a sieve to remove secretive or incomplete applications and trivial inventions from the process. Instead, the language of 35 U.S.C. § 101⁷ has given the United States court system pause on numerous occasions in attempting to decide whether unfamiliar technology should qualify for patent protection, or whether the granting of such inventions would inhibit rather than promote further scientific progress.⁸ Rather than viewing the language of 35 U.S.C. § 101 as a nominal statement of the sphere of patent eligible inventions, the courts have insisted upon parsing ill-defined boundaries from the text of the statute.⁹ Few have questioned the wisdom of this approach, despite the metaphysical gauntlets it has visited upon the learned members of the courts, and the sometimes eccentric results of its application.

For example, although a novel method for producing a unique electric signal may be patentable, the signal itself is not.¹⁰ Such is the holding of a decision handed down by the United States Court of Appeals for the Federal Circuit in a 2007 patent case, *In re Nuijten*.¹¹ The case concerned a patent for a novel technique of improving digital watermarking technology by altering the watermarked signal so as to minimize the resulting distortion.¹² Nuijten applied for and received a

⁶ All three of these requirements can be found in Title 35 of the United States Code. The novelty requirement is given in 35 U.S.C. § 102 (listing a number of situations removing the right to patent based on prior use or knowledge of the invention); the non-obviousness requirement is codified in 35 U.S.C. § 103 (eliminating the right to patent from otherwise eligible inventions if they would have been obvious to persons of ordinary skill in the field); and the disclosure requirement is contained in 35 U.S.C. § 112 (requiring a written description that enables a person of ordinary skill in the art to practice the invention). For a more substantive discussion of these requirements, see *infra* Part III.

⁷ 35 U.S.C. § 101 (2007) (“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.”).

⁸ See *infra* Parts I.B and I.C.

⁹ See *infra* Parts I.B and I.C.

¹⁰ *In re Nuijten*, 500 F.3d 1346 (Fed. Cir. 2007).

¹¹ *Id.*

¹² *Id.* at 1348-49. A digital watermark is supplemental information encoded into an electronic signal to identify the author of the content or the owner of the copyright. See, e.g., June M. Besek, *Anti-Circumvention Laws and Copyright: A Report from the Kernochan Center for Law, Media and the Arts*, 27 COLUM. J.L. & ARTS 385, 447-48 (2004). An invisible digital watermark can be identified by certain software, but is ideally imperceptible to human recipients of the stored information. However, as embedding supplemental data within the electric signal requires altering the signal from its original form, the quality of the content encoded in the signal is inevitably denigrated to some degree. See, e.g., Richard Elen, *DVD-Audio Watermarking Fiasco Continues*, AUDIOREVOLUTION.COM, Aug. 9, 2000,

number of method claims relating to his technique. However, Nuijten was not content with merely protecting the method of producing his watermarked signals; Nuijten also sought to claim the signals themselves.¹³ Nuijten's attempts to claim the signals produced by his process were rebuffed by the patent examiner, who rejected four such claims as outside the scope of patentable subject matter.¹⁴ Following an unsuccessful appeal to the Board of Patent Appeals and Interferences, Nuijten brought a petition for relief before the Court of Appeals for the Federal Circuit.

On review, Judge Gajarsa of the Federal Circuit proceeded to analyze Nuijten's claims under 35 U.S.C. §101, which provides in a single sentence the scope of inventions patentable under United States patent law.¹⁵ Due to the non-physical nature of the claimed invention, the initial hurdle facing Nuijten was demonstrating that his claims required a physical carrier for the modified signal rather than merely an abstract string of numbers with no physical representation.¹⁶ A claim which may be construed to include subject matter outside the scope of 35 U.S.C. § 101 will be rejected for failure to claim statutory subject matter.¹⁷

After determining that the claims in question did indeed require a physical embodiment of a signal,¹⁸ Judge Gajarsa determined that the disputed claims were nonetheless disallowed as directed towards non-

<http://www.avrev.com/news/0800/09.dvdwatermark.shtml>. Thus, the importance of devising encoding methods that minimize the disturbance perceptible to a human receiver is evident.

¹³ "The claims whose disallowance Nuijten appeals are not traditional step-by-step process claims, nor are they directed to any apparatus for generating, receiving, processing, or storing the signals. As mentioned above, such claims have been allowed [referring to Nuijten's other claims]. The claims on appeal seek to cover the resulting encoded signals *themselves*." *In re Nuijten*, 500 F.3d at 1351.

¹⁴ The court emphasized that Nuijten attempted to claim the signal itself in the disputed claim:

Claim 14 of Nuijten's application is the only independent claim of the four rejected by the PTO. It reads: *A signal with embedded supplemental data, the signal being encoded in accordance with a given encoding process and selected samples of the signal representing the supplemental data, and at least one of the samples preceding the selected samples is different from the sample corresponding to the given encoding process.*

Id. at 1351.

¹⁵ Section 101 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 therefore, subject to the conditions and requirements of this title." 35 U.S.C. § 101 (2007).

¹⁶ See *Diamond v. Diehr*, 450 U.S. 175, 185-87 (1981).

¹⁷ See *State St. Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368, 1370 (Fed. Cir. 1998).

¹⁸ "To convey information to a recipient a physical carrier, such as an electromagnetic wave, is needed. Thus, in order to be a 'signal,' as required by the claim, some carrier upon which the information is embedded is required." *In re Nuijten*, 500 F.3d at 1353 (citing *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1059 (Fed. Cir. 1992)).

statutory subject matter.¹⁹ The Judge reasoned that in order to qualify for patent protection, a claimed invention must fall within one of the four statutory categories enumerated in 35 U.S.C. §101—processes, machines, manufactures, and compositions of matter.²⁰ After considering each of these categories in turn and determining that Nuijten's signal fit within none of the categories, Judge Gajarsa concluded that the signal in question could not be granted patent protection.²¹ The category of manufacture, however, gave the Judge pause.²² While Judge Gajarsa acknowledged that the claimed signals were artificial productions of human artifice, he dismissed such as falling within the statutory category of manufacture based on the Supreme Court's prior definition of a manufacture as an article resulting from the process of manufacture.²³ Using the same dictionary that the Supreme Court had used, Judge Gajarsa defined a manufacture as a "particular substance or commodity," and reasoned that an electric signal was not sufficiently tangible to satisfy this definition.²⁴

Judge Linn concurred in the majority's determination regarding the physical aspects of a signal, as used in the language of Nuijten's claim; however, the Judge dissented vigorously with the majority's conclusion that the claim at issue did not fall within the statutory category of a manufacture.²⁵ Judge Linn disagreed for a variety of reasons, ranging from the majority's reliance on a dictionary for the definition of the word "manufacture,"²⁶ to the characterization of the claimed signal as "fleeting."²⁷ The dissent further argued that the majority disregarded

¹⁹ *Id.*

²⁰

The four categories together describe the exclusive reach of patentable subject matter. If a claim covers material not found in any of the four statutory categories, that claim falls outside the plainly express scope of § 101 even if the subject matter is otherwise new and useful. We must therefore determine whether any of the four categories encompass the claims on appeal

Id. at 1354.

²¹ "A transitory propagating signal like Nuijten's is not a 'process, machine, manufacture or composition of matter.' Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." *Id.* at 1357.

²² *See id.* at 1356.

²³ *Id.*

²⁴ *Id.* Note that this approach requires Judge Gajarsa to address various concepts of physics beyond the ken of the average jurist. The Judge discusses the transmission of a signal through a vacuum ("a medium that, by definition, is devoid of matter") and the wave-particle duality as applied to electromagnetic energy ("the fact that photons traveling at or near the speed of light behave in some ways like particles does not make them tangible articles"). *Id.* at 1357.

²⁵ *See id.* at 1358 (Linn, J., dissenting).

²⁶ *Id.* at 1361 (Linn, J., dissenting).

²⁷ "In many embodiments—for example, when the signal encodes an audio or video signal representing a symphony or full-length motion picture that is being watched in real-time the transmission may be in progress for a significant period of time." *Id.* at 1360 (Linn, J., dissenting).

prior Supreme Court precedent suggesting that the statutory language of 35 U.S.C. § 101 should be interpreted broadly, so as to include “anything under the sun that is made by man.”²⁸ Judge Linn did not contest the majority’s reasoning that a claim must be directed towards one of the four statutory categories,²⁹ but felt that these categories were meant to encompass the entirety of “technological ingenuity” rather than “delineate specific, narrow categories.”³⁰

The lengthy discussion of the scope of statutory subject matter in *Nuijten* is engaging, thorough, and spans nearly the entire history of patent jurisprudence in the United States.³¹ Yet, at no point does the court reach the policy ramifications of granting *Nuijten*’s claim. The majority’s focus on cabining a claimed innovation within a statutory category allows the court to deny patent protection to a novel invention³² while sidestepping consideration of the patent regime’s primary purpose: “To promote the Progress of Science and useful Arts.”³³ Rather than considering whether granting a patent on *Nuijten*’s signal would provide additional economic incentive to invent or prove an inequitable burden on future innovation, the Court devotes an inordinate quantity of judicial resources to debating the meaning of the word “manufacture” within the context of 35 U.S.C. §101.³⁴ As a result, *Nuijten* is resolved based on a metaphysical discussion of the nature of signals.

Regardless of whether one agrees with the majority in *Nuijten* that the claimed signal did not qualify for patent protection, the Court’s methodology should raise concerns about the application of statutory subject matter doctrine to modern technology. An examination of the doctrine’s history shows that courts have struggled to develop a satisfactory scheme of analysis to determine whether a claim is directed towards statutory subject matter.³⁵ The issue of statutory subject matter is often left untouched for a period of years, and then resurrected and reformulated when new technological paradigms radically alter the

²⁸ *Id.* at 1362 (Linn, J., dissenting) (citing *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)).

²⁹ “Of course, as we noted in *State Street Bank*, a claim must be drafted to at least one of the four [statutory] categories.” *Id.* at 1362 (Linn, J., dissenting) (citing *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 n.9).

³⁰ *Id.*

³¹ Both the majority and the dissent refer to *O’Reilly v. Morse*, 14 L. Ed. 601 (1853); the dissent also cites *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007).

³² The PTO allowed *Nuijten* a number of claims relating to his invention, including the method for producing watermarked signals and the hardware required to produce and store these signals. *In re Nuijten*, 500 F.3d at 1351.

³³ U.S. CONST. art. I, § 8, cl. 8.

³⁴ See *In re Nuijten*, 500 F.3d at 1356-57; *id.* at 1359-61 (Linn, J., dissenting).

³⁵ See R. Carl Moy, *Statutory Subject Matter and Hybrid Claiming*, 17 J. MARSHALL J. COMPUTER & INFO L. 277, 279 (1998).

contours of innovation.³⁶

This Note suggests that the analysis of statutory subject matter by reference to statutory categories is neither useful nor required by the relevant statutes. The requirement that an invention fit squarely within one of these statutory categories to be eligible for patent protection is an animal of the court's own making.³⁷ The court has commendably sought to utilize these categories for the purpose of protecting a "scientific public domain."³⁸ Such a goal is clearly aimed at promoting the progress of science and the useful arts. Yet, it has proven difficult to draw an exclusionary line which disallows inhibitive patents without prejudicing claims on novel and non-obvious technology, where such analysis is based solely on attempts to categorize all inventions as either a "process, machine, manufacture or composition of matter."³⁹ As is evident in *Nuijten*, this approach results in fruitless efforts to describe emerging technology in terms of statutory language composed under an altogether different understanding of innovation,⁴⁰ while distracting the court from analyzing other requirements for patentability such as utility, novelty, non-obviousness, and enablement.⁴¹ The requirement of utility excludes discoveries which lack functionality outside the realm of academia from the scope of patentable subject matter.⁴² Novelty mandates that the inventor introduce a previously unknown machination in order to receive a limited monopoly over his or her design.⁴³ Inventions that have already been disclosed to the public, either through prior use of the invention or publication of a description of the invention, will not receive patent protection.⁴⁴ Non-obviousness prevents incremental inventors from receiving a patent for trivial

³⁶ See, e.g., Eileen M. Kane, *Patent Ineligibility: Maintaining a Scientific Public Domain*, 80 ST. JOHN'S L. REV. 519, 553 (2006) ("Patent eligibility is a doctrine which often reappears when new technologies or scientific imperatives create the possibility of patenting novel forms of subject matter. It may lie dormant, but it is not obsolete."); Robert Greene Sterne & Lawrence B. Bugaisky, *The Expansion of Statutory Subject Matter Under the 1952 Patent Act*, 37 AKRON L. REV. 217, 218 (2004) ("The expansion of statutory subject matter appears to have been driven by two mutually reinforcing factors. The first one, of course, is the accelerating pace of invention as technology continues to rapidly advance. More importantly, however, is the fact that the 1952 Act did not include any express exclusionary limits on statutory subject matter.").

³⁷ See *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 n.9 (Fed. Cir. 1998) ("Of course, the subject matter must fall into at least one category of statutory subject matter.").

³⁸ See Kane, *supra* note 36, at 553 ("the patentable subject matter doctrine has the delicate role of safeguarding the scientific public domain").

³⁹ 35 U.S.C. § 101 (2007).

⁴⁰ See Part II.A, *infra*, for a discussion of the transition from patenting mechanical devices towards the patenting of more ethereal computer processes.

⁴¹ See 35 U.S.C. §§ 101, 102, 103, 112 (2007).

⁴² See *id.* § 101.

⁴³ See *id.* § 102.

⁴⁴ See 1 DONALD S. CHISUM, CHISUM ON PATENTS: A TREATISE ON THE LAW OF PATENTABILITY, VALIDITY AND INFRINGEMENT §§ 3.04-3.05 (2007).

improvements on existing technology.⁴⁵ An invention which would have been obvious to a person of ordinary skill in the relevant area of technology given the contemporary state of knowledge will not receive patent protection.⁴⁶ Enablement requires an inventor to disclose the entirety of his or her knowledge concerning the invention sought to be claimed in order to receive a patent.⁴⁷ If a patent applicant does not provide information sufficient to enable a person of ordinary skill in the art to construct or practice the claimed invention, or conceals the optimal manner of practicing the invention, then a patent will not issue.⁴⁸ These four requirements may prove better suited to analyzing the implications of a particular claim on the underlying concerns of patent law, in that they require a determination as to whether the inventor has indeed discovered a new and useful art deserving of patent protection, and whether the inventor has claimed more than he or she has disclosed to the public.⁴⁹

Part I of this Note examines the origin of the statutory subject matter doctrine and the statutory categories used in modern patent jurisprudence. It discusses the evolution of the statutory subject matter doctrine in the Supreme Court, and the treatment that the doctrine has received in the Federal Circuit following the Supreme Court's most recent decision on the matter in *Diamond v. Diehr*.⁵⁰ Part II discusses the struggle to develop a doctrine that excludes traditionally non-patentable innovations such as abstract scientific principles,⁵¹ while expanding the scope of the doctrine to include modern technology of a more intangible form. Part III suggests alternative means of accomplishing the function of exclusion sought by the court, separate and apart from the requirement that an invention be placed within one of the four established statutory categories. Part IV concludes that the courts should abandon the statutory categorization approach and rely on other requirements for patentability that are more easily adapted to achieve the purpose of promoting the progress of science and the useful arts.

⁴⁵ See 35 U.S.C. § 103 (2007).

⁴⁶ See CHISUM, *supra* note 44, § 5.01.

⁴⁷ See 35 U.S.C. § 112 (2007).

⁴⁸ See CHISUM, *supra* note 44, §§ 7.03-7.05.

⁴⁹ See Kristen Osenga, *Ants, Elephant Guns, and Statutory Subject Matter*, 39 ARIZ. ST. L.J. 1087, 1091-92 (2007) ("The Patent Office and some commentators are using § 101 rejections as a means to avoid tackling other policy or practical issues that should be handled through other avenues. The rejections thus serve as proxies for inquiries that are made more appropriately under other requirements of patentability, such as utility, novelty, non-obviousness, adequate written description, and enablement.").

⁵⁰ *Diamond v. Diehr*, 450 U.S. 175 (1981).

⁵¹ See CHISUM, *supra* note 44, § 1.01 ("The general purpose of the statutory classes of subject matter is to limit patent protection to the field of applied technology, what the United States constitution calls 'the useful arts.' Theoretical or abstract discoveries are excluded . . .").

I. THE TROUBLED HISTORY OF STATUTORY SUBJECT MATTER
JURISPRUDENCE

A. *The Origins of Statutory Categorization*

Like much of the law in the United States, patent law has its roots in the English legal system.⁵² An early English statute concerning the prohibition of monopolies provided an exception for the production and use of “new manufactures.”⁵³ Even during this early stage of the English patent system, the English courts recognized a need to grant a wide scope to the statutory language in order to provide economic incentives for invention; thus, the term “manufacture” was read to include not only tangible physical devices, but also methods of producing certain physical results.⁵⁴ The first patent statute enacted in the United States, the United States Patent Act of 1790, contained substantially broader reach in the statutory language itself, allowing an inventor to seek a patent for “any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used.”⁵⁵ This language was modified a scant three years later to encompass “any new and useful art, machine, manufacture, or composition of matter . . .”⁵⁶ That language remained until the Patent Act of 1952, which exchanged the term “art” for “process,” and defined a process as a “process, art or method.”⁵⁷

The origin of the judicial practice of using the four statutory categories enumerated in 35 U.S.C. § 101 as a means of analyzing whether a given invention qualifies as statutory subject matter is more difficult to trace. One of the early cases to use the term “statutory category” is *Application of Kirk*, a decision handed down by the United States Court of Customs and Patent Appeals in 1967, but statutory subject matter is not the main source of dispute in that case.⁵⁸ Furthermore, it is unclear whether the court is speaking of expressly distinguishable categories or rather of 35 U.S.C. § 101 as defining the category of patentable subject matter.⁵⁹ Another relatively early

⁵² See B. Zorina Khan & Kenneth L. Sokoloff, *History Lessons: The Early Development of Intellectual Property Institutions in the United States*, 15 J. ECON. PERSPECTIVES 233, 235-36 (2001); see also CHISUM, *supra* note 44, § 1.01.

⁵³ *Id.* § 101.

⁵⁴ *Id.* (noting that the English court construed the statute broadly so as to include “processes as well as products”).

⁵⁵ Act of Apr. 10, 1790, ch. VII, § 1, 1 Stat. 109.

⁵⁶ Act of Feb. 21, 1793, ch. XI, § 1, 1 Stat. 318.

⁵⁷ CHISUM, *supra* note 44, § 101; 35 U.S.C. § 100(b) (2007).

⁵⁸ *Application of Kirk*, 54 C.C.P.A. 1119, 1152 (C.C.P.A. 1967).

⁵⁹ *Id.* (“The invention must fall in the statutory category of 35 U.S.C. 101.”).

decision which speaks to this matter and specifically states that an invention must fall within one of the four categories enumerated in 35 U.S.C. § 101 is that of *Kewanee Oil Co. v. Bicron Corp.*, a 1974 Supreme Court case.⁶⁰ This case is cited by a leading treatise on patent law for the proposition that any given invention must fall within one of the statutory classes of subject matter in order to qualify for patent protection.⁶¹ However, the issue of primary concern in that case was whether Federal patent law preempts Ohio state trade secret law, not whether a particular invention falls within the scope of the patent laws.⁶²

B. *The Supreme Court*

One of the first decisions in which the Court confronted a dispute over the scope of statutory subject matter was that of *O'Reilly v. Morse*.⁶³ Morse filed an application for a patent on the telegraph in 1838, and the patent was issued in 1840.⁶⁴ Morse subsequently brought an action for infringement against O'Reilly, whom Morse claimed had constructed and operated an infringing telegraph line between Louisville, Kentucky and Nashville, Tennessee.⁶⁵ O'Reilly sought to counter Morse's suit by challenging the validity of Morse's patent. The Court upheld the first seven of the claims contained in the patent, but invalidated Morse's eighth claim.⁶⁶ In Morse's eighth claim, the inventor claimed an exclusive right to the use of electro-magnetism to transmit markings and characters, regardless of any physical device or machinery used to accomplish that purpose.⁶⁷

⁶⁰ 416 U.S. 470 (1974).

⁶¹ See CHISUM, *supra* note 44, § 1.01 n.2 (citing *Kewanee Oil*, 416 U.S. at 483 for the proposition that "no patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter of 35 U.S.C. § 101").

⁶² See *Kewanee Oil*, 416 U.S. at 473-75. The statement regarding statutory categories seems to be a sort of careless aside, since there is no citation to prior case law given for the proposition, and there is no discussion of the origin of this requirement; the court simply states that "[s]ince no patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter of 35 U.S.C. § 101, the holder of such a discovery would have no reason to apply for a patent whether trade secret protection existed or not." *Id.* at 483. The Court seems to regard this requirement as the obvious result of the wording of 35 U.S.C. § 101.

⁶³ *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854).

⁶⁴ *Id.* at 76, 81.

⁶⁵ *Id.* at 67.

⁶⁶ "We perceive no well-founded objection to the description which is given of the whole invention and its separate parts, nor to his right to a patent for the first seven inventions set forth in the specification of his claims. The difficulty arises on the eighth." *Id.* at 112.

⁶⁷ In language which a contemporary patent examiner would almost certainly find refreshing for its honesty, Morse made no attempt to disguise the breadth of his claim:

I do not propose to limit myself to the specific machinery or parts of machinery

O'Reilly is often cited in scholarly works for the notion that a scientific principle is unpatentable.⁶⁸ Yet, it is unclear by what reasoning the majority arrived at its holding. Certain language in the opinion rings of exclusion from statutory subject matter, while other portions seem more concerned with issues of disclosure and enablement.⁶⁹ The majority's concern with the broad coverage of Morse's claim would seem to indicate that its primary concern is enablement; the benefit of any future device for communicating using principles of electromagnetism would accrue to Morse, despite that Morse had not disclosed information sufficient to enable the construction of such a device.⁷⁰ That is to say, any inventor who wished to construct a novel means for communicating through the use of electromagnetic signals would have to obtain a license from Morse, even though Morse had provided only the abstract idea of such communication and not the particular means for implementing it.⁷¹ The

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 electromagnetism, 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.

Id. at 112.

⁶⁸ See, e.g., Ann Sturtz Viksnins, *Amgen, Inc. v. United States International Trade Commission: Designer Genes Don't Fit*, 76 MINN. L. REV. 161, 166 n.25 (1991) (citing for the proposition that a "scientific principle [is] not patentable"); William A. Drennan, *The Patented Loophole: How Should Congress Respond to this Judicial Invention?*, 59 FLA. L. REV. 229, 238 n.35 (2007); Peter S. Menell, *Patents and Diversity in Innovation Policy Conference: A Method for Reforming the Patent System*, 13 MICH. TELECOMM. TECH. L. REV. 487, 490 n.7 (2007), available at <http://www.mttl.org/volthirteen/menell.pdf>.

⁶⁹ At one point in the opinion the court states that "the discovery of a principle in natural philosophy or physical science, is not patentable." *Morse*, 56 U.S. at 116. This language certainly seems to imply that a scientific principle, as such, does not fall within the scope of patentable subject matter given in 35 U.S.C. § 101. However, earlier in the opinion the court evinces concern that Morse's eighth claim would grant the inventor rights beyond the useful knowledge he has disclosed to the public: "he claims an exclusive right to use a manner and process which he has not described and indeed had not invented, and therefore could not describe when he obtained his patent." *Id.* at 113. Further on in the opinion, the court expresses concern that "Morse has not discovered, that the electric or galvanic current will always print at a distance, no matter what may be the form of the machinery or mechanical contrivances through which it passes." *Id.* at 117. These criticisms sound of conflict with the requirement of enablement through disclosure as expressed in 35 U.S.C. § 112.

⁷⁰ The majority writes that

[f]or aught that we now know some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff's specification. His invention may be less complicated—less liable to get out of order—less expensive in construction, and in its operation. But yet if it is covered by this patent the inventor could not use it, nor the public have the benefit of it without the permission of this patentee.

Id. at 113. One could argue that this proposition proves too much; any patent could be subject to similar criticism. However, the Court's primary concern in the instant case seems to be that the inventor will be rewarded for inventions that were not enabled by the inventor's disclosure.

⁷¹ See CHISUM, *supra* note 44, § 1.01 ("Theoretical or abstract discoveries are excluded as are

dissent does not contest the majority's assessment that science in the abstract is unpatentable.⁷² Instead, the dissent disagrees with the notion that a claim may be attacked on the grounds that it is overly broad, rather than lacking in novelty or disclosure.⁷³ Thus, while both the majority and dissent in *Morse* agree that scientific principles in the abstract should be excluded from patent protection, the means for identifying applications which seek to patent such principles remains in contention.

The issue of applying patent protection to scientific principles was raised once again in *Funk Bros. Seed Co. v. Kalo Inoculant Co.*⁷⁴ In that case, the patent in question concerned a combination of bacteria used to inoculate plants.⁷⁵ The patentee had discovered a combination of bacteria that could effectively inoculate a variety of crops, allowing farmers to purchase one mixture of inoculants rather than rely upon a separate product for each species of crop.⁷⁶ It had previously been assumed that such mixtures could not be produced, as different species of bacteria produced mutually inhibiting effects, reducing the effectiveness of the bacteria as an inoculant.⁷⁷ The Court rejected a number of product claims relating to the novel mixtures on the grounds that the inventor was attempting to claim a patent for discovering a principle of nature.⁷⁸ The Court characterizes the application of the

discoveries, however practical and useful, in nontechnological arts, such as the liberal arts, the social sciences, theoretical mathematics, and business and management methodology. This focus on technology explains the preoccupation of patent law with means. A patent can issue only for a new means of achieving a useful end or result. Those who articulate new problems or recognize new needs frequently make valuable contributions to society but cannot look to the patent system for reward unless they go on to find a new and specific process, machine, manufacture, or composition of matter that solves the problem or meets the need.”).

⁷² Indeed, the dissent explicitly states that science in the abstract is not patentable: “[t]he mere discovery of a new element, or law, or principle of nature, without any valuable application of it to the arts, is not the subject of a patent.” *Morse*, 56 U.S. at 132 (Grier, J., dissenting).

⁷³ The dissent asks of the majority opinion,

[w]hat is meant by a claim being to [sic] broad? The patent law and judicial decisions may be searched in vain for a provision or decision that a patent may be impugned for claiming no more than the patentee invented or discovered. It is only when he claims something before known and used, something as new which is not new, either by mistake or intentionally, that his patent is affected.

Id. at 135 (Grier, J., dissenting). The dissent's concern here is that other patentable inventions or discoveries of singular importance will be excluded from patent protection due to their breadth. Thus, patent law would achieve the seemingly undesirable effect of rewarding the incremental inventor while giving short shrift to the inventor who advances the state of the art by leaps and bounds.

⁷⁴ 333 U.S. 127 (1948).

⁷⁵ *Id.* at 130.

⁷⁶ *Id.* at 129.

⁷⁷ *Id.* at 129-30.

⁷⁸ The Court asserted that Bond, the inventor, had not created the desirable qualities of the bacteria used in his mixture, but merely discovered the inherent qualities in certain bacteria which allowed them to be combined without a resulting deterioration in efficacy. The Court held that such “phenomena of nature” are “part of the storehouse of knowledge of all men” and thus

discovered principle as “hardly more than an advance in the packaging of the inoculants.”⁷⁹ Once again, there is cause for confusion in the source of the Court’s ruling. The portion of the majority opinion which faults the patentee for attempting to claim a law of nature seems like a proposition based on the requirements of eligible statutory subject matter—i.e., a rejection for failure to claim a discovery within the scope of 35 U.S.C. § 101. However, the subsequent language referring to the natural performance of the bacteria and the failure of the bacteria to “acquire a different use” sounds of objections based on novelty and obviousness.⁸⁰ Furthermore, the concurring opinion voices concerns that are founded in enablement requirements; the concurrence is concerned that the patent claims combinations of bacteria which the inventor has not disclosed.⁸¹

The cases of *Morse* and *Funk* involved examples of inventions that presented the difficult task of distinguishing between an abstract scientific principle and an application of the principle to a novel and useful invention. In *Morse*, the question was whether the use of an electric signal to communicate symbols is an application of the principle, or the principle itself. In *Funk*, the question was whether the inventor was attempting to patent the invention of a novel mixture of cooperating bacteria, or the principle that certain bacteria will operate effectively as inoculants when mixed. These questions may ostensibly reflect upon the requirement of statutory subject matter, but as discussed above, the reasons that the rejected claims fall outside of the borders of statutory subject matter reflect concerns based in novelty, obviousness, and enablement rather than any statutory directive in 35 U.S.C. § 101 to exclude certain categories of claims.

Given the difficulty the Court demonstrated in considering patent eligibility for such innovations as the telegraph and seed inoculants, a struggle involving the emerging field of computer technology was inevitable. This issue came before the Court in *Gottschalk v. Benson*, a case involving the patentability of an algorithm for use in computer software.⁸² In holding that such a claim was ineligible for patent protection, the Court cited *Funk Bros.* for the principle that patentability must derive from the application of a natural phenomenon rather than its discovery.⁸³ The Court’s conceptual trauma in dealing with the unfamiliar digital technology is evident from the cautious language of

incapable of protection through a patent monopoly. *Id.* at 130.

⁷⁹ *Id.* at 131.

⁸⁰ *See id.*

⁸¹ “The strains by which Bond secured compatibility are not identified and are identifiable only by their compatibility.” *Id.* at 133.

⁸² 409 U.S. 63 (1972).

⁸³ *Id.* at 67-68.

the holding.⁸⁴ In *Benson*, the Court framed the question squarely in terms of statutory subject matter, namely whether the method claimed is within the definition of a ‘process’ as the term was used in the Patent Act.⁸⁵ The Court responded to this inquiry by giving a questionable definition of an algorithm (the Court gave a generic mathematical definition of an algorithm rather than a definition in the context of computer science),⁸⁶ and then placed algorithms within the same class as unpatentable laws of nature.⁸⁷ Once again, the majority’s stated concern with subject matter reflects challenges arising from diverse areas of the patent law. Basing its decision in statutory subject matter rationale rather than enablement allows the Court to dispose of the claim without expounding upon its ulterior motives.⁸⁸

Six years after the decision in *Benson*, the Court once again was faced with a dilemma concerning the patentability of a method for use in a computer program. In *Parker v. Flook*, the Court was called upon to decide whether a method for updating alarm limits during catalytic

⁸⁴ The Court holds that allowing the claims presented would be tantamount to allowing a claim on the mathematical formula itself, as the process claim was not tied to any particular function or equipment. *Id.* at 72-73. At the same time, the Court denied that its decision was meant to preclude the patentability of computer programs, and expresses a desire for Congressional action on the issue. *See id.* at 71, 73.

⁸⁵ *See id.* at 64.

⁸⁶ The Court defines an algorithm as “a procedure for solving a given type of mathematical problem.” *Id.* at 65. However, given that the Court is discussing an algorithm for use in a computer program, reference to an authority on Computer Science may be more appropriate. The following is a definition taken from a textbook produced for Computer Science courses in data structures and algorithms:

Informally, an algorithm is any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output. An algorithm is thus a sequence of computational steps that transform the input into the output. We can also view an algorithm as a tool for solving a well-specified computational problem. The statement of the problem specifies in general terms the desired input/output relationship. The algorithm describes a specific computational procedure for achieving that input/output relationship.

THOMAS H. CORMEN ET AL., INTRODUCTION TO ALGORITHMS 5 (2d ed. 2001). This definition, which speaks of an algorithm as a series of steps or a tool which transforms an input into an output to achieve a particular result, presents a concept which more readily conforms to a patentable method achieving a tangible result.

⁸⁷ *Benson*, 409 U.S. at 67-68.

⁸⁸ The majority expresses hesitation to grant a claim “so abstract and sweeping as to cover both known and unknown uses” of the claimed algorithm. *Id.* at 65. Compare this language with the Court’s concern in *O’Reilly v. Morse*, 56 U.S. (15 How.) 62, 112-13 (1853), discussed *supra*. Once again, this language rings of concerns founded in enablement and disclosure, rather than statutory subject matter. The Court’s stated discomfort with allowing a claim in the abstract reflects a substantive concern with allowing a claim beyond the inventor’s contribution to the state of the art. Framing this rejection in terms of subject matter allows the Court to avoid difficult considerations of the merits of the invention, such as why an algorithm which the court acknowledges “has no substantial practical application except in connection with a digital computer” presents special concerns beyond those normally associated with the monopolistic nature of a patent right. *Benson*, 409 U.S. at 71.

conversion was eligible for patent protection.⁸⁹ The majority opinion explicitly grounded its holding on the statutory subject matter requirements of 35 U.S.C. § 101,⁹⁰ although different sections of the opinion revealed alternative concerns with disclosure, novelty, and obviousness.⁹¹ The majority in *Flook* recognized that the claim at issue was distinct from the claim presented in *Benson*, in that the claim did not seek to preempt the use of a mathematical formula in its entirety, but limits the claim to use of the formula in conjunction with a particular industrial application.⁹² However, this distinction did not save the patent applicant, as the majority writes that the novelty required to support a claim cannot originate solely from the mathematical algorithm.⁹³ Finding that the claim in question failed this test, the Court then rejected the claim as directed towards non-statutory subject matter.⁹⁴ The Court's analysis was problematic in that it clearly injects analysis of novelty and obviousness into the determination of statutory subject matter. This suggested that statutory subject matter lacks utility as a substantive bar to patentability, but was rather used as an aggregator to support rejections based in novelty, obviousness, and disclosure where the court cannot quite detail how those concerns are capable of independently supporting a rejection.⁹⁵

Following the decisions in *Benson* and *Flook*, the Court seemed to have severely limited the prospects for extending patent protection to

⁸⁹ 437 U.S. 584 (1978). The patent examiner rejected the patent application, reasoning that because the only novel aspect of the claim was the use of the applicant's formula for computing alarm limits, a patent on the method would be a patent on the formula itself. *Id.* at 587. The Court of Custom and Patent Appeals reversed based on the claim's limitation for use in updating alarm limits; merely solving the formula would not infringe on the claim. *Id.*

⁹⁰ *Id.* at 588.

⁹¹ Early in the majority opinion, Justice Stevens notes that [t]he patent application does not purport to explain how to select the appropriate margin of safety, the weighting factor, or any of the other variables. Nor does it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. *Id.* at 586. This language hints at concerns with disclosure and utility. Similarly, Stevens's discussion of statutory subject matter is saturated with language implicating obviousness as a grounds for rejection: "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.'" *Id.* at 594.

⁹² *Id.* at 590.

⁹³ *Id.* at 591 ("The process itself, not merely the mathematical algorithm, must be new and useful.").

⁹⁴ "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." *Id.* at 595 n.18.

⁹⁵ At one point in its opinion, the Court suggests that the bar against patenting laws of nature is not grounded in subject statutory matter per se, but is rather akin to the doctrine of inherency; "[t]he underlying notion is that a scientific principle . . . reveals a relationship that has always existed." *Id.* at 593 n.15.

computer software despite its assurances to the contrary.⁹⁶ The turning point in the expansion of statutory subject matter came in *Diamond v. Chakrabarty*, although the patent claims at issue involved bacteria rather than computer software.⁹⁷ Justice Berger, writing for the majority, opined that it was not the duty of the Court to restrict the scope of patent protection without an express directive from the legislature.⁹⁸ This approach represented a striking reversal from the decisions delivered in the prior cases, where the Court declined to expand statutory subject matter without first receiving additional instruction from Congress.⁹⁹ Arguably, *Chakrabarty* constituted a paradigm shift in the realm of patent eligibility. The Court's decree opened the gates of the Patent Office to a multitude of emerging technologies, and in turn allowed industry in these areas access to the coffers of commercial investors.¹⁰⁰ The technology sector would not

⁹⁶ The majority in *Benson* explicitly disapproved of granting patents for digital software programs without authorization from Congress. See *Gottschalk v. Benson*, 409 U.S. 63, 73 (1972). Yet at the same time, the Court denied that it was freezing "process patents to old technologies, leaving no room for the revelations of the new, onrushing technology." *Id.* at 71. The majority in *Flook* likewise issued a judicial request for advice from the legislature, while disclaiming any intent to issue a broad policy judgment against the patentability of computer programs. *Flook*, 437 U.S. at 595.

⁹⁷ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (holding that a claim for a genetically engineered bacteria not found in nature is eligible for patent protection).

⁹⁸ Justifying a broad construction of the terms in 35 U.S.C. § 101, Justice Burger referred to the legislative history behind the Patent Act of 1952: "Congress intended statutory subject matter to 'include anything under the sun that is made by man.'" *Id.* at 309 (citing S. REP. NO. 1979, 82d Cong., 2d Sess., 5 (1952)). However, the opinion then qualifies this statement by reasserting the viability of statutory subject matter as a limitation on patentability. *Id.* ("This is not to suggest that § 101 has no limits or that it embraces every discovery. The laws of nature, physical phenomena, and abstract ideas have been held not patentable.").

⁹⁹ The majority in *Chakrabarty* argues that its holding does not conflict with the reasoning in *Flook*, yet it is difficult to reconcile the ambitious language of the *Chakrabarty* court with the cautious statements of its predecessor. See *Chakrabarty*, 447 U.S. at 315 ("Congress has performed its constitutional role in defining patentable subject matter in § 101; we perform ours in construing the language Congress has employed."); *Flook*, 437 U.S. at 596 ("We would require a clear and certain signal from Congress before approving the position of a litigant who, as respondent here, argues that the beachhead of privilege is wider, and the area of public use narrower, than the courts had previously thought."). The *Chakrabarty* majority's attempt to harmonize its decision with *Flook* is rather unsatisfying. Possibly the Court's holding was a result of public pressure to protect American firms by widening the reach of patent law to burgeoning industries in biotechnology and the tech sector.

¹⁰⁰ See David G. Scalise & Daniel Nugent, *International Intellectual Property Protections for Living Matter: Biotechnology, Multinational Conventions and the Exception for Agriculture*, 27 CASE W. RES. J. INT'L L. 83, 97 (1995) ("With this decision the Supreme Court unveiled to U.S. science and industry a vast new world of opportunity. Initially, many waited to see if Congress would accept the Supreme Court's invitation to enact regulations covering the area of life patents. However, as the resulting legislative paralysis became apparent, a rush into genetic research ensued. Chakrabarty's broad interpretation of patentable subject matter provided U.S. companies with the promise of patents to protect their investments into new technologies. As a result, U.S. industry greatly expanded its commitment to genetic engineering, establishing an early position of world dominance it has yet to yield."); A. Samuel Oddi, *Regeneration in American Patent Law: Statutory Subject Matter*, 46 IDEA 491, 559-60 (2000) ("It is my view that Chakrabarty

have to wait long before the principles of expansionism expressed in *Chakrabarty* were specifically applied to a patent for a computer program.

In 1981, only one year after the Supreme Court's landmark decision in *Chakrabarty*, the Court delivered its last opinion on the scope of patentable subject matter. In the case of *Diamond v. Diehr*, the Court was presented with an appeal regarding a process for curing synthetic rubber.¹⁰¹ The inventor's process involved calculating the length of time required to cure rubber by use of a digital computer and the Arrhenius equation, a well known formula.¹⁰² The Arrhenius equation was used by the rubber curing industry to determine the amount of time required in a heating press to produce a marketable product. However, as the actual temperature inside the press fluctuated during the curing process, the use of an estimated temperature value in the Arrhenius equation would sometimes result in an incorrect estimate of the appropriate cure time, and the creation of an unusable product.¹⁰³ The process at issue in *Diehr* sought to address this problem by constantly measuring the temperature inside the press, and using this information to recalculate the cure time by means of a computer.¹⁰⁴ When the actual time elapsed equaled the recalculated time, the computer would issue a signal to open the press.¹⁰⁵ The patent examiner had rejected the applicant's claims as directed towards non-statutory subject matter under 35 U.S.C. § 101; the examiner reasoned that the only novel elements of the claim were those involving the use of the Arrhenius equation and a computer for solving that equation.¹⁰⁶ The Court of Customs and Patent Appeals reversed, reasoning that the use of a computer program in an otherwise eligible industrial process did not

ushered in the modern era of patent law, at least insofar as the patent eligibility issue is concerned. The style of *Chakrabarty* may not be Grand (at least with a capitol [sic] G), for no one would confuse the writing of Chief Justice Burger with that of Chief Justice Marshall or of Justice Story. Nonetheless, by wisely following the lead of Judge Rich, the instrumental goal of the Patent Clause was advanced by no longer placing a barrier on inventions that do not fit into established patterns of technology.”).

¹⁰¹ 450 U.S. 175 (1981).

¹⁰² *Id.* at 177-78.

¹⁰³ *Id.* (“[T]he conventional industry practice has been to calculate the cure time as the shortest time in which all parts of the product will definitely be cured But the shortcoming of this practice is that operating with an uncontrollable variable inevitably led in some instances to overestimating the mold-opening time and overcuring the rubber, and in other instances to underestimating that time and undercuring the product.”).

¹⁰⁴ *Id.* (“Respondents characterize their contribution to the art to reside in the process of constantly measuring the actual temperature inside the mold. These temperature measurements are then automatically fed into a computer which repeatedly recalculates the cure time by use of the Arrhenius equation.”).

¹⁰⁵ *Id.* at 179.

¹⁰⁶ *Id.* at 179-81. Once again, the initial rejection during patent prosecution is stated in terms of statutory subject matter, but is clearly based on concerns relating to novelty and obviousness.

compel a rejection for non-statutory subject matter.¹⁰⁷ In affirming the decision of the Court of Customs and Patent Appeals, the Supreme Court referred to its prior decision in *Chakrabarty* and again cited the Committee Reports which accompanied the Patent Act of 1952.¹⁰⁸ The Court focused on the transformative nature of the applicant's process in determining that the claims describe an industrial process which "fall[] within the § 101 categories of possibly patentable subject matter."¹⁰⁹ Specifically disclaiming the test used by the patent examiner, the Court held that an inquiry into whether claims are directed towards statutory subject matter must focus on the claims as a whole, rather than the eligibility of any particular element in a claim.¹¹⁰ The Court was explicit in delineating boundaries between the analysis of statutory subject matter and the analysis of novelty and obviousness.¹¹¹ The result was that the Court weakened the functionality of statutory subject matter as a substantive bar to the patentability of computer processes, by directing examiners not to seize upon a particular element of the claimed process as non-statutory subject matter but to consider the process as a whole.¹¹² As long as those computer processes are claimed as elements within a larger process, which seeks to effect some change or transformation of a physical article, the claims will not be barred as directed towards an unpatentable mathematic algorithm. However, the decision in *Diehr* leaves computer programs, standing independently and unattached to any physically transformative process, beyond the scope of protection as non-statutory subject matter.¹¹³

What is it that separated the invention in *Diehr* from those inventions denied patent protection in *Flook* and *Benson* for failure to satisfy the threshold inquiry into statutory subject matter requirements? While it is relatively clear that the claim in *Benson* was directed towards

¹⁰⁷ *Id.* at 181.

¹⁰⁸ *Id.* at 181-82.

¹⁰⁹ *Id.* at 184.

¹¹⁰ *Id.* at 188-89. Note that the court also disapproves of any method of analysis which injects an assessment of novelty into the initial determination regarding statutory subject matter. *Id.* at 188-89 ("The '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.").

¹¹¹ *Id.* at 190. ("The question . . . of whether a particular invention is novel is 'wholly apart from whether the invention falls into a category of statutory subject matter.'" (citing *In re Bergy*, 596 F.2d 952, 961 (C.C.P.A. 1979))).

¹¹² The Court's decision in *Diehr* signaled that patent examiners should determine whether the invention as a whole contained statutory subject matter, and then proceed to the more substantive issues of novelty and non-obviousness in relation to the statutory elements of the claimed invention. See Moy, *supra* note 35, at 300-09. Thus, fewer applications should result in rejections based solely on statutory subject matter.

¹¹³ The Court does not repudiate its prior decisions in either *Gottschalk v. Benson*, 409 U.S. 63 (1972), or *Parker v. Flook*, 437 U.S. 584 (1978), and takes care to reiterate that there are limits to the scope of 35 U.S.C. § 101. See *Diehr*, 450 U.S. at 185-87.

an algorithm unbound by any particular use or physical embodiments, it is more difficult to distinguish the method for computing alarm limits in *Flook* from the method for computing cure time in *Diehr*. Just as the opinions in *Flook* and *Benson* belie concerns with novelty and disclosure, the opinion in *Diehr* displays a satisfaction with the inventor's efforts.¹¹⁴ The process described in *Flook* does not provide the same degree of disclosure that is provided with the application in *Diehr*; the inventor seeks to claim a method of computing an alarm limit, but does not describe how the values used in the alarm limit should be ascertained.¹¹⁵ The inventor in *Diehr* remedies that omission by clearly describing the entirety of his process, and properly enabling a person of ordinary skill to practice his invention.¹¹⁶ In contrast, the inventor in *Flook* leaves the application of his process in a useful capacity to the research of future inventors.¹¹⁷ Why, then, is it necessary to fashion unwieldy tests for determining whether a particular claim goes to an algorithm or a process, rather than relying on the more easily applied barriers to patentability provided by the requirements of novelty and disclosure? As the following section will show, the Federal Circuit has struggled in the wake of *Diehr* to compose elegant tests which would bring digital technology within the scope of statutory subject matter, while still ensuring that science in the abstract remained ineligible for patent protection.

C. *The Federal Circuit and Supreme Silence*

For the better part of three decades, the Federal Circuit has continued to adapt the doctrine of statutory subject matter to accommodate emerging technology.¹¹⁸ The Supreme Court has been content to allow the Federal Circuit to craft law regarding this issue; *Diehr* remains the most recent decision issued by the nation's highest

¹¹⁴ See *id.* at 193 nn.14-15.

¹¹⁵ See *id.* at 193 n.14.

¹¹⁶ The majority opinion in *Diehr* characterized the inventor's disclosure as describing "a process of curing rubber beginning with the loading of the mold and ending with the opening of the press and the production of a synthetic rubber product that has been perfectly cured—a result heretofore unknown in the art." *Id.* at 193 n.15.

¹¹⁷ In stark contrast to the Court's favorable treatment of the inventor's process in the instant case, the majority in *Diehr* singled out those portions of the method described in *Flook* which were inadequately conveyed in the inventor's patent application. In reference to *Flook*, the court wrote "the patent application did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm unit." *Id.* at 193 n.14.

¹¹⁸ See generally Jeffery M. Kuhn, *Patentable Subject Matter Matters: New Uses for an Old Doctrine*, 22 BERKELEY TECH. L.J. 89 (2007).

court concerning the scope of patentable subject matter.¹¹⁹ The case of *Arrhythmia Research Tech. Inc. v. Corazonix Corp.* was illustrative of the Federal Circuit's attempt to mold existing precedent to include new technology with the sphere of patent protection.¹²⁰ *Arrhythmia* concerned an invention related to the analysis of electrocardiographic signals in heart attack victims to determine the vulnerability of the victim to a condition known as ventricular tachycardia.¹²¹ The "critical feature" of the invention involved analyzing the electrical signals measured in the patient's heart.¹²² The District Court had rejected the inventor's claims as directed towards a mathematical algorithm, and therefore unpatentable as non-statutory subject matter.¹²³ The Federal Circuit applied the *Freeman-Walter-Abele* test in reviewing that decision.¹²⁴ The *Freeman-Walter-Abele* test asks two questions: whether a mathematical algorithm is recited directly or indirectly in the claims, and if so, whether the claimed invention as a whole is no more than the algorithm itself.¹²⁵ The difficulty in this test lies with the second prong. How does one determine whether the invention as a whole is no more than the algorithm itself? The *Arrhythmia* court took its cues from *Diehr*, and found that the invention satisfied the requirements of statutory subject matter due to the limitation on use of the algorithm in conjunction with other substantive process steps.¹²⁶ Yet the process in *Diehr* was of a different nature. The method at issue concerned the transformation of rubber, a physical material, whereas the

¹¹⁹ While the Supreme Court has remained mostly silent on this issue, recent events indicate that a number of Justices would like to revisit this neglected subject. The Supreme Court initially granted a petition for writ of certiorari in the case of *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 546 U.S. 975 (2005). However, this writ was later dismissed as improvidently granted. See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124 (2006). While the Court provided no reasoning for the dismissal, Justice Breyer issued a lengthy dissenting opinion, in which Justices Stevens and Souter joined. See *id.* at 125-39 (Stevens, J., dissenting). Therefore, it is possible that the Supreme Court's apparent policy of disengagement on the issue of statutory subject matter may soon come to an end.

¹²⁰ 958 F.2d 1053 (1992).

¹²¹ *Id.* at 1054.

¹²² *Id.* at 1055.

¹²³ *Id.*

¹²⁴ The *Freeman-Walter-Abele* test is a doctrine which developed in the Federal Circuit's predecessor, the Court of Customs and Patent Appeals. See *In re Freeman*, 573 F.2d 1237 (C.C.P.A. 1978); *In re Walter*, 618 F.2d 758 (C.C.P.A. 1980); *In re Abele*, 684 F.2d 902 (C.C.P.A. 1982).

¹²⁵ *Arrhythmia*, 958 F.2d at 1058. The Court interprets the second prong of this test as determining "whether the claim is directed to a mathematical algorithm that is not applied to or limited by physical elements or process steps." *Id.*

¹²⁶ See *id.* at 1059-60 ("The Simson claims are analogous to those upheld in *Diehr*, wherein the Court remarked that the applicants 'do not seek to patent a mathematical formula. . . they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.' Simson's claimed method is similarly limited. The process claims comprise statutory subject matter." (citation omitted)).

process in *Arrhythmia* produces a number.¹²⁷ The *Arrhythmia* court handled this discrepancy by arguing that the steps of converting, applying, determining, and comparing electric signals are “physical process steps that transform one physical, electrical signal into another.”¹²⁸ The court was not entirely without precedent in making this argument;¹²⁹ however, it was certainly questionable whether the Supreme Court in *Diehr* intended to include the modification of electrical signals as a physical, transformative process. The court was forced to make this argument in order to resolve the difficulty presented by seeking a test which excludes science in the abstract from patentability while preserving the eligibility of modern technology. The court recognized that the invention in *Arrhythmia* was not science in the abstract.¹³⁰ Yet the court struggled with the English language and determined that signals are physical in order to satisfy the requirements of statutory subject matter. The majority opinion in *Arrhythmia* was illustrative of the unnecessary conceptual trauma that was caused by the use of statutory subject categories as a substantive bar to patentability. The court itself relies on concerns with disclosure in order to distinguish the prior cases of *O’Reilly* and *Benson*.¹³¹ This was evidence of the redundant purpose served by requiring that inventions fit within a category of statutory subject matter in order to be considered eligible for a patent. The underlying concern of this doctrine was to prevent the privatizing of basic scientific concepts, which would inhibit rather than promote the advancement of research and innovation in the United States.¹³² However, these concerns are more readily addressed by requirements such as disclosure.

The Federal Circuit seemed to recognize as much when it issued its opinion in *State St. Bank & Trust Co. v. Signature Fin. Group*.¹³³ The patent in question concerned a data processing system for use in the operation of a mutual fund.¹³⁴ Following the rejection of a number of method claims, the patentee obtained a patent for six machine claims which described a computer and the software necessary for operating

¹²⁷ See *Diamond v. Diehr*, 450 U.S. 175, 184 (1981) (“That respondents’ claims involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing cannot be disputed.”).

¹²⁸ *Arrhythmia*, 958 F.2d at 1059.

¹²⁹ The Court cites *In re Taner*, 681 F.2d 787, 790 (C.C.P.A. 1982) for the proposition that signals may be viewed as physical. *Arrhythmia*, 958 F.2d at 1059.

¹³⁰ *Id.* at 1060 (“[T]he number obtained is not a mathematical abstraction; it is a measure in millivolts of a specified heart activity, an indicator of the risk of ventricular tachycardia.”).

¹³¹ *Id.* at 1059 (“The claims do not encompass subject matter transcending what Dr. Simson invented, as in *O’Reilly v. Morse* . . . or in *Benson* . . .”).

¹³² See, e.g., Kane, *supra* note 36.

¹³³ 149 F.3d 1368 (Fed. Cir. 1998).

¹³⁴ *Id.* at 1370.

the system.¹³⁵ During infringement litigation, the defendant was awarded summary judgment based on the invalidity of the patent.¹³⁶ The District Court found that the patent was directed towards non-statutory subject matter based upon either the “mathematical algorithm” exception or the “business method” exception.¹³⁷ Prior to this decision, it was commonly held in the lower courts that a means of doing business could not be the subject of a patent due to the existence of the business method exception.¹³⁸ The Federal Circuit responded by disclaiming the existence of any exception to statutory subject matter besides the requirements imposed by the language of 35 U.S.C. § 101.¹³⁹ Following a discussion of the origin and purpose of the *Freeman-Walter-Abele* test, the Court then proceeded to hold this test inapplicable for determining whether a claim satisfies the requirements of statutory subject matter.¹⁴⁰ Rather than focusing on the presence of an algorithm within the claimed matter, the court held that this inquiry should hinge on whether the invention produced a “useful, concrete, and tangible result.”¹⁴¹ The court took a very broad view of the scope of patentable subject matter, and recognized that the analysis of statutory subject matter was separate and apart from the analysis of other barriers to patentability, such as novelty, obviousness, and disclosure.¹⁴² The ramifications of this approach were significant; indeed, some viewed the decision in *State Street* as an indication that statutory subject matter would no longer serve as a significant barrier to patentability.¹⁴³

¹³⁵ *Id.* at 1371. The Court, however, did not think it particularly important whether the invention was claimed as a machine or method, “as long as it falls within at least one of the four enumerated categories of patentable subject matter, ‘machine’ and ‘process’ being such categories.” *Id.* at 1372.

¹³⁶ *Id.* at 1370.

¹³⁷ *Id.* at 1372.

¹³⁸ *See id.* at 1375-76.

¹³⁹ *Id.* at 1372 (“The plain and unambiguous meaning of § 101 is that any invention falling within one of the four stated categories of statutory subject matter may be patented, provided it meets the other requirements for patentability set forth in Title 35, i.e., those found in §§ 102, 103, and 112, ¶2.”). The Court not only dismisses the business method exception, but denies that such an exception was ever established by the Federal Circuit or its predecessor, the Court of Customs and Patent Appeals. *Id.* at 1375-76.

¹⁴⁰ *See id.* at 1373-75.

¹⁴¹ *Id.* at 1375 (citing *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994)).

¹⁴² The Court specifically addresses the district court’s concern with the scope of the patent. The district court warned that if the patent were to be upheld, any financial organization seeking to institute a similar operation using any type of software would be required to seek the permission of the patentee. In response, the Federal Circuit indicated that the appropriate statutory mechanism for addressing such concerns could be found in the requirements of novelty, obviousness, and disclosure: “Whether the patent’s claims are too broad to be patentable is not to be judged under § 101, but rather under §§ 102, 103 and 112. Assuming the above statement to be correct, it has nothing to do with whether what is claimed is statutory subject matter.” *Id.* at 1377.

¹⁴³ *See, e.g.,* Oddi, *supra* note 100, at 557 (“What has become apparent is that § 101 patentable subject matter, after *Chakrabarty*, *Diehr*, and *State Street*, is no longer a significant impediment

Instead, it was assumed that statutory subject matter would serve as only a threshold inquiry leading to the more comprehensive examination of an invention's advances over the prior art, and the adequacy of the disclosure contained in the application.¹⁴⁴

The court expanded its ruling in *State Street* to specifically include process claims in the case of *AT&T Corp. v. Excel Commc'n., Inc.*¹⁴⁵ The case arose in much the same manner as its predecessor. The Patent Office granted AT&T a patent for a system to determine the long distance carrier of a telephone caller.¹⁴⁶ AT&T later brought suit against Excel for infringement, and Excel challenged the validity of AT&T's patent, alleging failure to claim statutory subject matter.¹⁴⁷ The district court agreed with Excel and invalidated AT&T's patent, holding that AT&T's claims were directed towards a mathematical algorithm and thus not eligible for patent protection.¹⁴⁸ The Federal Circuit reversed, referring to the evolution of statutory subject matter jurisprudence in response to changing technology and the previous decision in *State Street*.¹⁴⁹ The court made clear that the appropriate test for eligibility was whether the claimed process produced a "tangible, useful, result."¹⁵⁰ However, in yet another turbulent episode of the statutory subject matter saga, the *State Street* test was recently repudiated by the Federal Circuit in the 2008 case of *In re Bilski*.¹⁵¹

to patentability. Under Judge Rich's "Anatomy of the Patent Statute," as adopted by the Supreme Court in *Chakrabarty*, the primary focus should be on §§ 102, 103, and 112. Additionally, § 101 includes the utility requirement and still excludes laws of nature, natural phenomena, and abstract ideas. This result appears driven by instrumental reasoning based on the Patent Clause of the Constitution, as buttressed by effective application of legislative history and judicial decisions.").

¹⁴⁴ This is not to say that *State Street* removed subject matter as substantive barrier entirely; the Court cites *Diehr* for the principle that laws of nature, natural phenomena, and abstract ideas remain beyond the scope of 35 U.S.C. § 101. *State Street*, 149 F.3d at 1373.

¹⁴⁵ 172 F.3d 1352 (Fed. Cir. 1999).

¹⁴⁶ *Id.* at 1353.

¹⁴⁷ *See id.* at 1354-55.

¹⁴⁸ *Id.* at 1355-56.

¹⁴⁹ *Id.* at 1356. ("Since the process of manipulation of numbers is a fundamental part of computer technology, we have had to reexamine the rules that govern the patentability of such technology. The sea-changes in both law and technology stand as a testament to the ability of law to adapt to new and innovative concepts, while remaining true to basic principles. In an earlier era, the PTO published guidelines essentially rejecting the notion that computer programs were patentable. As the technology progressed, our predecessor court disagreed, and, overturning some of the earlier limiting principles regarding § 101, announced more expansive principles formulated with computer technology in mind. In our recent decision in *State Street*, this court discarded the so-called 'business method' exception and reassessed the 'mathematical algorithm' exception, *see* 149 F.3d at 1373-77, 47 U.S.P.Q.2D (BNA) at 1600-04, both judicially-created 'exceptions' to the statutory categories of § 101. As this brief review suggests, this court (and its predecessor) has struggled to make our understanding of the scope of § 101 responsive to the needs of the modern world.").

¹⁵⁰ *Id.* at 1361.

¹⁵¹ *In re Bilski*, 545 F.3d 943, 959 (Fed. Cir. 2008) ("[W]hile looking for 'a useful, concrete and tangible result' may in many instances provide useful indications of whether a claim is drawn to a fundamental principle or a practical application of such a principle, that inquiry is insufficient

The history of Federal Circuit case law concerning the scope of statutory subject matter evinces a struggle to compose a test which will separate laws of nature and math in the abstract from patent eligible computer programs and digital technology. The outcome of *Nuijten* reveals that contrary to the beliefs of some practitioners, statutory subject matter remains a substantive bar to patentability. The recent uprooting of the *State Street* test for statutory subject matter in *In re Bilski* provides further evidence of the Federal Circuit's difficulties in molding a subject matter test that properly encapsulates emerging technology within the patent regime.¹⁵²

Why is this struggle permitted to persist? The Federal Circuit is most likely concerned that the dissolution of this barrier would allow unscrupulous persons to encroach upon areas traditionally thought of as the scientific public domain, thus turning the patent system into an impediment to progress rather than a spur.¹⁵³ However, this concern is unwarranted, as this undesirable scenario can be averted through the assertion of rejections based in the more substantive requirements of the Patent Act mentioned previously in this Note: novelty, non-obviousness, and disclosure. Dismissing the statutory categories as an artificial limit to patent eligibility would allow the Court to concentrate its analysis on the underlying policy of patent law, which is to promote the progress of science and technology. Rather than becoming ensnared within esoteric debates over the tangible nature of modern scientific advances in order to quell the desire to place an invention within one of the four statutory categories of 35 U.S.C. § 101, the Court should treat 35 U.S.C. § 101 simply as a statement of the purpose of patent law.

II. ALTERNATIVE APPROACHES AND JUSTIFICATION

A. Statutory Construction

One serious impediment to the abandonment of the statutory categories is the language of the statute itself. A well known principle of statutory construction is that a court should not read a statute so as to render any word within the statute extraneous and ineffectual.¹⁵⁴

to determine whether a claim is patent-eligible under § 101.”)

¹⁵² See *id.* The majority in *Bilski* was faced with a patent application that sought to claim broad patent rights over a “method of hedging risk in the field of commodities trading.” *Id.* at 949. Once again, the majority opinion became embroiled in a discussion of the four statutory categories listed in 35 U.S.C. § 101. See *id.* at 951-55. However, the opinion written by the Board of Patent Appeals below expressed concerns that rang of enablement. See *id.* at 950.

¹⁵³ See Kane, *supra* note 36.

¹⁵⁴ “[A] court should give ‘effect, if possible, to every clause and word of a statute.’” United States Dep’t of Treasury v. Fabe, 508 U.S. 491, 504 (1993) (citing *Moskal v. United States*, 498

Arguably then, the language of 35 U.S.C. § 101 compels the courts to give effect to the statutory language by excluding inventions and discoveries which do not fall within one of the four enumerated categories of patentable subject matter.¹⁵⁵ Yet such an argument takes an unnecessarily narrow view of the purpose of this language. As the now infamous legislative history cited in *Chakrabarty* suggests, Congress meant for the language of § 101 to describe the broad scope of patentable material in its entirety, so as to “include anything under the sun that is made by man.”¹⁵⁶ The sentiments expressed in the legislative history support the position that Congress chose its words to describe the wide breadth of patentable subject matter. Therefore, abandoning the use of the statutory categories would not deny effect to the language chosen by the legislature, as the legislature meant to express broadly the purpose of the patent statutes.

Furthermore, reading the four categories of inventions given in 35 U.S.C. § 101 as exclusive limits upon the scope of statutory subject matter would seem to raise concerns with another canon of statutory construction, that the words in a statute should not be read so as to make any of them unnecessary or redundant.¹⁵⁷ Yet, the categories of machine and manufacture would seem to overlap, and the word manufacture ought to make the word machine unnecessary. The category of compositions of matter should by all rights swallow both machines and manufactures.¹⁵⁸ If Congress meant for the words process, machine, manufacture, and composition of matter to establish the exclusive range of patentable subject matter then they could just as well have omitted the words machine and manufacture. Therefore, rather than limit the sphere of patent eligible inventions to those which may be cabined within the four statutory categories, the better approach would be to recognize that Congress chose to use these overlapping terms to indicate just how expansive the scope of patentability should be. This view would comport more readily with the language used by Congress as

U.S. 103, 109-10 (1990), quoting *United States v. Menasche*, 348 U.S. 528, 538-39 (1955), and *Montclair v. Ramsdell*, 107 U.S. 147, 152 (1883)).

¹⁵⁵ “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 [35 USCS §§ 1 et seq.].” 35 U.S.C. § 101 (2000).

¹⁵⁶ S. REP. NO. 82-1979, at 5 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2399.

¹⁵⁷ *See Kungys v. United States*, 485 U.S. 759, 778 (1988) (citing “the cardinal rule of statutory interpretation that no provision should be construed to be entirely redundant”); *Colautti v. Franklin*, 439 U.S. 379, 392 (1979) (referring to “the elementary canon of construction that a statute should be interpreted so as not to render one part inoperative”); *Jarecki v. G. D. Searle & Co.*, 367 U.S. 303, 307-08 (1961) (“[W]e will not adopt a strained reading [of the statute] which renders one part a mere redundancy.”).

¹⁵⁸ However, it is possible that the dilemma of interpretation may be resolved by reference to a dictionary from that era.

cited by the court in *Chakrabarty*.¹⁵⁹

If there is no strong textualist argument in favor of circumscribing patentable subject matter within the four statutory categories of 35 U.S.C. § 101, then what reason remains for its persistence? The obvious answer is for reasons of policy. These statutory categories serve as a line drawn in the sand to prevent the granting of monopolistic rights over abstract ideas and principles of natures.¹⁶⁰ Yet as discussed above, this purpose is adequately served by the more substantive gatekeepers to patent eligibility: novelty, non-obviousness, and enablement.¹⁶¹ In many cases where courts have mandated the rejection of a patent application for failure to claim statutory subject matter, a rejection could have been given independently on one of these more substantive grounds. The judiciary's efforts to limit patentability by means of statutory categories have suffered from the same problems which plague all exercises in judicial line drawing. Yet the case of patentable subject matter presents a special challenge in this regard. Due to the very nature of patent law and its involvement with technological innovation, any line excluding innovations based on their tangible attributes must constantly be redrawn to accommodate our ever-evolving understanding of technological progress. Any delay in adapting such a line to emerging technologies will foreseeably frustrate one of the underlying purposes of the patent system, as researchers and investors driven by the profit motive will not be as quick to expend their resources on truly novel discoveries which are unlikely to be granted patent protection. Many argue that while line-drawing is indeed a difficult exercise, it is a task that courts must nevertheless undertake in furtherance of public policy.¹⁶² However, statutory subject matter does not present a situation where courts have no alternative means of furthering the public interest. As mentioned above, there exist established statutory mechanisms in the Patent Act which bar the patenting of inventions when such patents would not serve the public interest.¹⁶³ Further reliance upon the statutory categories to effect the same policy goals in a somewhat unwieldy fashion is unnecessary in

¹⁵⁹ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

¹⁶⁰ See Kane, *supra* note 36; see also Thomas R. Makin, *Hotel Checking: You Can Check Out Any Time You Want, But Can You Ever Leave? The Patenting of Business Methods*, 24 COLUM.-VLA J.L. & ARTS 93, 97 (2000) (“[C]ourts involved in judicial scrutiny of patent claims for statutory subject matter have allowed their novelty and obviousness concerns to lead to questions of what is open to patenting and what should remain ‘the heritage of humankind.’ In other words, the desire to protect the public domain was at the heart of judicial aversion-however manifested-to business method patents.”).

¹⁶¹ See *supra* Part I.B and Part I.C.

¹⁶² See, e.g., Maximilian R. Peterson, *Now You See It, Now You Don't: Was it a Patentable Machine or an Unpatentable “Algorithm”? On Principle and Expediency in Current Patent Law Doctrine Relating to Computer-Implemented Inventions*, 64 GEO. WASH. L. REV. 90, 125 (1995).

¹⁶³ See *infra* Part III for further discussion of these alternatives.

light of the comprehensive body of law governing novelty, non-obviousness, and enablement.

B. *Dodging the Question*

The doctrine of statutory subject matter is infused with a sense of redundancy. Courts that apply the doctrine to invalidate or deny particular claims often cite reasoning that reflects underlying concerns relating to novelty and enablement.¹⁶⁴ Justifying a particular rejection on the grounds of non-statutory subject matter permits the court to dismiss a difficult claim without clearly articulating the attendant policy concerns. Such was the case in *Nuijten*, where the majority rejected the claim for a manufactured electric signal without considering whether granting the patent would serve as an incentive for research in the area of encoded signals, and without considering whether the particular claim satisfied the requirements of enablement.¹⁶⁵ It would seem reasonable to infer that the majority's concerns were based primarily upon an unspoken desire to maintain the statutory subject matter doctrine as a guardian of the scientific public domain.¹⁶⁶

III. ALTERNATIVE APPROACHES

If statutory categories are to be abandoned as a substantive bar to patentability, then other mechanisms must be used to ensure that patents are not granted for laws of nature or science in the abstract, which would almost certainly inhibit further innovation. Fortunately, the current patent law provides suitable means for accomplishing this goal. As argued above, many of the concerns expressed by the majority in cases, such as *Benson* and *Flook*, sounded in terms of novelty and

¹⁶⁴ Professor Kane notes that “[i]t could be argued that there are shadow doctrines behind each exclusion from patentable subject matter which amplify why they cannot be patented. The patenting of natural phenomena and laws of nature most directly implicates issues of novelty, while the patenting of abstract ideas would be most immediately objected to on disclosure grounds.” Kane, *supra* note 36, at 546. However, she immediately qualifies this statement with the following: “This is not to suggest that these exclusions are redundant to existing doctrines—the Supreme Court certainly adheres to the categorical exclusions from patentable subject matter as the meaningful components of a public domain.” *Id.* at 546. See also Dan L. Burk & Mark A. Lemley, *Inherency*, 47 WM & MARY L. REV. 371, 408 (2005) (suggesting that the doctrine of inherency is a valid explanation for the prohibition on patenting laws of nature, as “mere articulation or description of an already operative principle does not qualify for patent protection”).

¹⁶⁵ See *In re Nuijten*, 500 F.3d 1346 (Fed. Cir. 2007).

¹⁶⁶ See, e.g., Kane, *supra* note 36; Makin, *supra* note 160.

enablement.¹⁶⁷ These requirements would serve admirably to accomplish the goal of maintaining a scientific domain public domain while allowing for patent protection to encompass emerging and currently unknowable technologies.

A. Novelty and Non-Obviousness

The requirements of novelty and obviousness go to the core interests of patent law; in order to receive a property right for an invention or discovery, the patent office must be certain that what you have invented is genuinely new.¹⁶⁸ The requirement of novelty asks whether anyone has previously disclosed the invention for which a patent is sought; obviousness asks whether a person having ordinary skill in the art would have thought it obvious to assemble the invention given the present state of the art, even if that exact invention had not previously been disclosed to the public.¹⁶⁹

In the *Flook* case discussed above, the Court did not consider questions of obviousness or novelty, as the case came before the Court following a rejection based on statutory subject matter.¹⁷⁰ However, based on the language provided by the Court, it is fairly clear how a rejection based on obviousness would have issued. Recall that the method sought for patenting in that case used a computer program to calculate an alarm limit for a chemical process.¹⁷¹ However, the majority wrote that the chemical process as well as the use of a computer to automatically monitor alarm limits were already known in the art.¹⁷² The only possible novel element introduced by the inventor was a modified algorithm for computing the alarm limit, and the novelty

¹⁶⁷ See *supra* Part I.B.

¹⁶⁸ See CHISUM, *supra* note 44, §3.01 (“An invention must be new at the time of discovery by an original inventor to be patentable. The novelty requirement lies at the heart of the patent system. Patent monopolies are granted in order to stimulate invention of useful devices, protect investments required to produce invention, and encourage the disclosure of trade secrets. The social cost is higher prices for and underutilization of the patented process or product during the period of the monopoly. Novelty deters people from engaging in original inventive activity that will not in fact increase ‘the store of common knowledge.’ Persons with a practical problem should look for the solution in the store before engaging in such activity.”).

¹⁶⁹ See *id.* (“The novelty requirement is closely related to that of nonobviousness. Novelty acts primarily in a negative fashion. If an invention is not new, then the invention is not patentable. That ends the inquiry. But if the invention is new, further inquiry must be made into whether it is ‘new enough,’ that is, not obvious to one with ordinary skill in the art.”).

¹⁷⁰ *Parker v. Flook*, 437 U.S. 584, 588 (1978).

¹⁷¹ *Id.* at 585.

¹⁷² *Id.* at 594 (“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 application simply provides a new and presumably better method for calculating alarm limit values.”).

of this algorithm was not questioned by the Court for procedural reasons.¹⁷³ Thus, the Court could well have rejected the inventor's attempt to patent a method for computing alarm limits as obvious in light of the combined prior art. As will be discussed below, this application could also have been laid to rest by a rejection based on failure to enable. In contrast, if we were to apply this approach to *Nuijten*, we should see that novelty and non-obviousness present no obstacle to the patentability of Nuijten's watermarked signals. The patent office had already acknowledged the merits of Nuijten's invention by granting a number of claims for the method itself and various devices used to carry out the method.¹⁷⁴ Thus, the only barrier which prevented Nuijten from obtaining a patent on the signal itself was the artificial construct of the statutory categories requirement.

B. *Enablement*

The requirement of enablement, which originates in 35 U.S.C. § 112, reflects another primary concern of patent law. The inventor must disclose information sufficient to enable a person of ordinary skill in the relevant field of technology to practice the claimed invention.¹⁷⁵ In exchange for the limited monopoly the inventor receives, he must place into the public realm the store of his knowledge regarding his invention, such that it may enter the public domain once the inventor's patent expires.¹⁷⁶

Using *Flook* as an example once more, consider how the failure to satisfy the enablement requirement might have been asserted against the inventor as grounds for rejecting his patent application. In addition to the Court's criticism of the inventor's contribution to the state of the art, the Court also addressed the inventor's failure to provide information relevant to practicing the claimed invention.¹⁷⁷ It is simple to see how a

¹⁷³ *Id.* at 594-95.

¹⁷⁴ *In re Nuijten*, 500 F.3d 1346, 1351 (Fed. Cir. 2007).

¹⁷⁵ See CHISUM, *supra* note 44, § 7.03 ("Since 1790, the patent laws have required that the inventor set forth in a patent specification sufficient information to enable a person skilled in the relevant art to *make and use* the invention.").

¹⁷⁶ *Id.* §7.01 ("The requirement of adequate disclosure assures that the public receives 'quid pro quo' for the limited monopoly granted to the inventor. Full disclosure of the invention and the manner of making and using it on issuance of the patent immediately increases the storehouse of public information available for further research and innovation and assures that the invention will be freely available to all once the statutory period of monopoly expires.").

¹⁷⁷ *Flook*, 437 U.S. at 586 ("The patent application does not purport to explain how to select the appropriate margin of safety, the weighting factor, or any of the other variables. Nor does it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit.").

rejection based on failure to meet the enablement requirements of the Patent Act would follow from this information. In contrast, consider the situation presented in *Nuijten*; as *Nuijten* was granted a number of claims relating to the methods and devices for producing his watermarked signals, it follows that *Nuijten* must have overcome any concerns based in enablement that the PTO may have raised.¹⁷⁸ Thus, once again, the only argument that the PTO could muster against granting *Nuijten* a claim for the watermarked signals themselves was that these signals could not be pigeonholed within one of the four statutory categories of 35 U.S.C. § 101. As has been discussed above, this approach is unnecessary in light of the legislative history of the Patent Act.¹⁷⁹ The result reached in *Nuijten* is symptomatic of a confused doctrine which prejudices emerging technology that cannot readily be placed within the paradigm of innovation familiar to the courts. The courts should abandon the analysis of statutory categories, and instead rely upon the more robust requirements of novelty, non-obviousness, and enablement to ensure that the patent system does not become a “hindrance rather than a spur” to innovation.¹⁸⁰

CONCLUSION

Considering that *Nuijten*’s rejected claims would satisfy the requirements of novelty, non-obviousness, and disclosure, they seem to merit patent protection. *Nuijten* does not seek to claim the electric signal in the abstract, but only as a result of a specific process invented and disclosed by the applicant. The limitation of the claim to signals produced by *Nuijten*’s proprietary process alleviates concerns that a signal pattern created without the aid of *Nuijten*’s innovation would infringe the patent claim. It would be impossible for *Nuijten* to assert his patent rights over a naturally occurring signal, or over any signal which was not produced by means of his proprietary method, as such signals would not fall within the language of *Nuijten*’s claim. Furthermore, even though *Nuijten* was rewarded with a number of claims for his innovation, the attempt to patent the watermarked signals themselves was by no means frivolous. Patenting the signal itself may be necessary in order to prevent an unscrupulous competitor from using *Nuijten*’s method to produce watermarked signals overseas.¹⁸¹ Thus, the

¹⁷⁸ *In re Nuijten*, 500 F.3d at 1351.

¹⁷⁹ See *supra* Part II.

¹⁸⁰ ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT (2004).

¹⁸¹ See, e.g., John F. Duffy, *In re Nuijten: Patentable Subject Matter, Textualism, and the Supreme Court* (2007), available at

decision in *Nuijten* serves as an example of how the artificial barrier of statutory construction may effect results counter to the goals of the patent system, by denying protection to novel advancements for reasons based not in public policy but rather on ill-fated attempts to define as of yet unknown technologies within the text of static legislation. Abandoning the use of the statutory categories of 35 U.S.C. § 101 as a substantive impediment to patentability, and placing reliance upon the more concrete provisions of 35 U.S.C. §§ 102, 103, and 112 would serve to better promote the progress of science.

http://www.patentlyo.com/patent/2007/02/in_re_nuijten_p.html (referring to Phillips, *Nuijten*'s employer, Duffy writes that "Philips' reason for wanting signal claims is fairly evident: Philips wants to be able to bring direct infringement actions against parties transporting its novel form of signals. The process claims will not protect Philips against overseas generation of the signals, and the 'storage medium' claims will not necessarily reach a company that is merely transporting the signals.").