

PATENT ELIGIBLE SUBJECT MATTER: PROTECTING THE
PUBLIC DOMAIN

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INTRODUCTION

The question of what subject matter is eligible for utility patent protection is controversial. Commentators have argued that the current body of law is both unpredictable and in a state of disarray.¹ The U.S. Patent & Trademark

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¹See, e.g., Susan M. Gerber & A. Patricia Campbell, *Patent Eligibility Remains Uncertain, Even After Recent Efforts to Bring Clarity*, LAW.COM (Jan. 11, 2019), <https://www.law.com/2019/01/11/patent-eligibility-remains-uncertain-even-after-recent-efforts-to-bring-clarity/>. See also *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 915 F.3d 743,

Office has issued numerous guidelines instructing patent examiners on how to deal with this issue.² Congress is considering a legislative solution that would “fix” this area of law.³ Judges on the Court of Appeals for the Federal Circuit disagree on the interpretation of relevant Supreme Court precedents.⁴ Although historically this was a rarely litigated issue, in recent years it has been frequently litigated before the U.S. Supreme Court⁵ and the Court of Appeals for the Federal Circuit.⁶

A full understanding of this subject matter dispute requires an examination of a basic concept. The law has long recognized the general rule that ideas per se are part of the public domain — free for all to use.⁷ Under copyright law, an idea per se is not protectable.⁸ However, an idea’s form of

762 (Fed. Cir. 2019) (Newman, J., dissenting) (“[The federal circuit’s Section 101] decisions have not been consistent.”).

²See, e.g., 2019 Revised Patent Subject Matter Eligibility Guidance, <https://www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf> (last visited May 13, 2019). See generally Stuart P. Meyer, *No Shortage of Viewpoints on New USPTO Patent Eligibility Guidelines*, BILSKI BLOG (Mar. 26, 2019), <https://www.bilskiblog.com/2019/03/no-shortage-of-viewpoints-on-new-uspto-patent-eligibility-guidelines/> (discussing differing views on the Guidelines).

³See Gene Quinn, *Congress is Trying to Fix 101: To Do So, They Must Overrule Mayo*, IP WATCHDOG (Mar. 7, 2019), <https://www.ipwatchdog.com/2019/03/07/congress-trying-fix-101-must-overrule-mayo/id=107117/>. See also Scott McKeown, *Congress Poised to Align Courts with USPTO on 101 Reform*, PATENTS POST-GRANT (Apr. 17, 2019), <https://www.patentspostgrant.com/congress-poised-to-follow-uspto-lead-on-101-reform/>.

⁴See, e.g., *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 927 F.3d 1333, 1335–73 (Fed. Cir. 2019).

⁵See, e.g., *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 208 (2014); *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013); *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 566 U.S. 66, 70–71 (2012).

⁶See, e.g., *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 765 (Fed. Cir. 2019) (technology related to charging station for electric vehicles held patent ineligible); *Athena Diagnostics, Inc.*, 915 F.3d at 743 (Fed. Cir. 2019) (method of diagnosing neurological disorders held patent ineligible); *Exergen Corp. v. Kaz USA, Inc.*, 725 F. App’x 959, 963 (Fed. Cir. 2019) (unpublished opinion) (method and apparatus for measuring body temperature held patent eligible); *Endo Pharms. Inc. v. Teva Pharms. USA, Inc.*, 919 F.3d 1347, 1352 (Fed. Cir. 2019) (method of treating pain with pharmaceutical held patent eligible); *Finjan, Inc. v. Blue Coat Sys.*, 879 F.3d 1299, 1303 (Fed. Cir. 2018) (method for providing computer security held patent eligible); *In re Ebera*, 730 F. App’x 916, 917 (Fed. Cir. 2018) (method of doing business held patent ineligible).

⁷*Desny v. Wilder*, 299 P.2d 257, 265–66 (Cal. 1956).

⁸*Universal Athletic Sales Co. v. Salkeld*, 511 F.2d 904, 908 (3d Cir. 1975).

expression is protectable.⁹ Under patent law, an idea per se is also not protectable, although an embodiment of the idea is eligible for patent protection.¹⁰

This general rule is not altered merely because someone has invested substantial time and capital in developing or discovering an idea.¹¹ Nevertheless, under certain circumstances it can be inherently unjust to allow a third party to commercially exploit an idea developed by someone else. Hence, although a public domain of ideas exists for the benefit of the public, under certain circumstances the creator of such ideas can be granted legal protection.¹² For example, if an idea is secretly used in a business enterprise such that it provides an economic advantage over competitors, it may be protected by trade secret law.¹³ Likewise, contract law can be used to protect a novel idea that has been converted into a concrete form.¹⁴

The real issue, therefore, in the debate over what is patent eligible subject matter is the size or scope of the public domain. Certain basic scientific facts, ideas, and concepts should be free for all to use. Such things should not be amenable to ownership by anyone. Hence, they should be ineligible for property ownership in the form of patent protection.

This paper will examine the concept of a public domain comprised of ideas, information, and knowledge that is generally free for all to use. This concept permeates all of the various bodies of law that have historically protected intellectual property. This paper will then review recent Federal Circuit opinions that have addressed whether purported inventions are patent eligible subject matter and conclude that such decisions are generally properly distinguishing between patent eligible and patent ineligible inventions.

⁹ *Id.*

¹⁰ *Mech. Plastics Corp. v. Titan Techs., Inc.*, 823 F. Supp. 1137, 1142 (S.D.N.Y. 1993), *aff'd*, 33 F.3d 50 (2d Cir. 1994).

¹¹ *Desny*, 299 P.2d at 265 (quoting *Int'l News Serv. v. Associated Press*, 248 U.S. 215, 250 (1918) (Brandeis, J., dissenting)).

¹² *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 350–51 (1991).

¹³ See Uniform Trade Secrets Act §§ 1–12 (1985), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (visited Dec. 5, 2019) (adopted by 49 states) (state trade secret law); see also 18 U.S.C. §§ 1831–39 (2018) (federal trade secret law). See generally *Hoffmann-La Roche Inc. v. Yoder*, 950 F. Supp. 1348, 1357 (S.D. Ohio 1997) (“virtually any type of information can be a trade secret”).

¹⁴ See, e.g., *Tate v. Scanlan Int'l, Inc.*, 403 N.W.2d 666, 669–71 (Minn. Ct. App. 1987).

I. THE PUBLIC DOMAIN AND IP LAW

A. *Copyright Law*

Under copyright law ideas, information and concepts generally fall into the public domain.¹⁵ Property protection under copyright law only extends to the form of expression of such things.¹⁶ For example, an idea expressed in a law review article is free for anyone to use without attribution. However, copying the words used to express the idea may amount to copyright infringement. Likewise, the general plot idea for a television show is not protectable under copyright although the specific details of a particular episode of the show, such as dialogue among the actors, may fall within the domain of copyrightable aspects of the show.¹⁷

Additionally, the public domain under copyright law includes the form of expression if such otherwise infringing use falls within the robust fair use doctrine.¹⁸ This doctrine typically permits the use of some copyright protected subject matter for public policy reasons.¹⁹ For example, copyright law prohibits reproduction of copyrightable subject matter.²⁰ However, this may be contrary to freedom of speech protected by the First Amendment.²¹ Hence, when First Amendment concerns outweigh copyright law, the fair use doctrine negates copyright rights.²² For example, copyrightable subject matter can be shown as part of a news report if it is newsworthy.²³

¹⁵ See 17 U.S.C. § 102(b) (2018); see also *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 547 (1985) (“no author may copyright facts or ideas”).

¹⁶ See generally *Harper & Row, Publishers, Inc.*, 471 U.S. at 547; see also *Yankee Candle Co. v. Bridgewater Candle Co.*, 259 F.3d 25, 33 (1st Cir. 2001).

¹⁷ See generally *Williams v. A&E Television Networks*, 122 F. Supp. 3d 157, 161–62 (S.D.N.Y. 2015); *Castorina v. Spike Cable Networks, Inc.*, 784 F. Supp. 2d 107, 111 (E.D.N.Y. 2011); *Rodriguez v. Heidi Klum Co.*, No. 05 Civ 10218, 2008 WL 4449416, *4–5 (S.D.N.Y. 2008).

¹⁸ 17 U.S.C. § 107.

¹⁹ *Id.*

²⁰ *Id.* § 106(1).

²¹ Robert C. Denicola, *Copyright and Free Speech: Constitutional Limitations on the Protection of Expression*, 67 CALIF. L. REV. 283, 284 (1979).

²² *Triangle Publ'ns, Inc. v. Knight-Ridder Newspapers, Inc.*, 626 F.2d 1171, 1174 (5th Cir. 1980) (fair use can eliminate conflicts between free speech and copyright protection).

²³ Denicola, *supra* note 21, at 311–12.

The fair use doctrine also recognizes that certain things are fundamental to creative works and should therefore be free for everyone to use.²⁴ This doctrine recognizes that virtually all creative works are built on what others have previously done.²⁵ As a result, a public domain is necessary in order to enable subsequent individuals to create new creative works. Failure to place such fundamental things in the public domain would render them unavailable to innovators and could depress future creative endeavors.²⁶

Other doctrines, such as merger and *scènes à faire*, also delineate a public copyright domain. The merger doctrine places the copyrightable form of expression in the public domain when the form of expression of an idea and the underlying idea merge in the sense that they are inseparable.²⁷ This prevents an idea from being protected by copyright law.²⁸ *Scènes à faire* recognizes that certain elements of a creative work are not protected by copyright law because they are dictated by or are customary elements of a particular genre.²⁹ This allows anyone to freely create new works in that genre.³⁰

Copyright law therefore relies on the idea/form of expression distinction, the fair use doctrine, the merger doctrine and *scènes à faire* to create a public domain of subject matter that falls outside the protection of copyright law. This ensures the existence of a robust copyright public domain which minimizes impingement of both free speech rights and the freedom to create.

²⁴ See Harper & Row, Publishers, Inc. v. Nation Enters., 471 U.S. 539, 549 (1985).

²⁵ See Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 575 (1994).

²⁶ *Id.* at 577.

²⁷ N.Y. Mercantile Exch., Inc. v. IntercontinentalExchange, Inc., 497 F.3d 109, 116–17 (2d Cir. 2007).

²⁸ *Id.*; Parker v. Outdoor Channel Holdings, No. 2-11-CV-00159-J, 2012 WL 6200177, *3 (N.D. Tex. 2012).

²⁹ Parker, 2012 WL 6200177 at *3 (N.D. Tex. 2012) (“*scènes à faire*, which are ‘expressions that are standard, stock, or common to a particular topic or that necessarily follow from a common theme or setting’”); see, e.g., Horizon Comics Prods., Inc. v. Marvel Entm’t, LLC, 246 F. Supp. 3d 937, 943 (S.D.N.Y. 2017) (In comic book context, the fighting pose of a superhero is a *scènes à faire*); see also Softel, Inc. v. Dragon Med. & Sci. Comm’ns, Inc., 118 F.3d 955, 963 (2d Cir. 1997) (In computer software context, “the *scènes à faire* doctrine denies protection to program elements that are dictated by external factors such as ‘the mechanical specifications of the computer on which a particular program is intended to run’ or ‘widely accepted programming practices within the computer industry.’”).

³⁰ See Steele v. Turner Broad. Sys., Inc., 646 F. Supp. 2d 185, 192 (D. Mass. 2009) (policy underlying *scènes à faire* doctrine is to prevent monopolies of common or general ideas).

B. Trade Secret Law

Information, which broadly construed includes ideas, is generally in the public domain. Trade secret law carves out a limited situation when such information can be granted property status under state³¹ and federal³² trade secret laws. Often the information is used in a business enterprise, although protection is available as long as the information has a potential use or value to the enterprise.³³ The information must provide an economic advantage over competitors who are unaware of the information.³⁴ It must not be readily ascertainable by others.³⁵ And, it must be maintained in secret.³⁶

Trade secrets are a form of conditional or defeasible property that exists only as long as secrecy is maintained.³⁷ Hence, if the trade secret is disclosed to the public, whether intentionally or accidentally, it typically forfeits its trade secret status and enters the public domain.³⁸ Likewise, if a third party independently discovers a trade secret and publicly discloses it, the trade secret ceases to exist and no liability arises from such disclosure.³⁹ Additionally, if a product embodying a trade secret is sold to the public, the buyer is free to reverse engineer the product to ascertain the trade secret.⁴⁰

³¹Uniform Trade Secrets Act §§ 1–12 (1985), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (visited Dec. 5, 2019) (adopted by 49 states).

³²18 U.S.C. §§ 1831–39 (2018).

³³*Id.* § 1839(3)(B); Uniform Trade Secrets Act § 1(4), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states).

³⁴18 U.S.C. § 1839(3)(B); Uniform Trade Secrets Act § 1(4), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states).

³⁵18 U.S.C. § 1839(3)(B); Uniform Trade Secrets Act § 1(4), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states).

³⁶18 U.S.C. § 1839(3)(A); Uniform Trade Secrets Act § 1(4), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states).

³⁷*In re Remington Arms Co.*, 952 F.2d 1029, 1032 (8th Cir. 1991).

³⁸*Id.*; see also *In re Shalala*, 996 F.2d 962, 965 (8th Cir. 1993) (public disclosure destroys property rights in trade secret).

³⁹*Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476 (1974).

⁴⁰*Id.* (noting that reverse engineering is the process of “starting with the known product and working backward to divine the process which aided in its development or manufacture”).

She is then free to utilize the trade secret without liability.⁴¹ And, if she discloses it to the public the trade secret ceases to exist.⁴²

Trade secret law, therefore, only protects information maintained in secret.⁴³ Hence, it does not provide protection to information that is available to the public. Additionally, misappropriation of a trade secret is only actionable against a party who has wrongfully acquired the information via breaching a contractual agreement, breaching a fiduciary duty or via improper means.⁴⁴

C. Trademark Law

Under both state and federal trademark laws, words or symbols that are used to identify products and services sold in commerce are granted property status as trademarks or service marks, respectively.⁴⁵ Such property rights prohibit others from using the marks in a commercial context in such a way that consumer confusion is likely to result.⁴⁶ For example, it is likely consumer confusion would occur if someone makes and sells a new cola-flavored soft drink under the COKE trademark because many consumers would incorrectly think the drink was sold by the Coca-Cola Company. Hence, such conduct would amount to trademark infringement.

Famous trademarks, such as COKE, are entitled to additional protection against trademark dilution.⁴⁷ Dilution can arise when the same or similar mark is used by a third party to sell dissimilar goods despite the absence of consumer confusion.⁴⁸ For example, selling COKE widescreen televisions is

⁴¹ Acquiring a trade secret via reverse engineering is not improper. ELIZABETH A. ROWE & SHARON K. SANDEEN, *TRADE SECRET LAW – CASES AND MATERIALS* 234 (2d ed. 2017).

⁴² *Remington*, 952 F.2d at 1032.

⁴³ 18 U.S.C. § 1839(3)(A) (2018); Uniform Trade Secrets Act § 1(4), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states).

⁴⁴ See generally Rowe & Sandeen, *supra* note 41 at 231 (misappropriation arises based on the conduct of the misappropriator).

⁴⁵ DAVID L. LANGE, MARY LAFRANCE, GARY MYERS, & LEE ANN W. LOCKRIDGE, *INTELLECTUAL PROPERTY – CASES AND MATERIALS* 33–34 (4th ed. 2012). For federal trademark law see 15 U.S.C. §§ 1051–1141n (2018).

⁴⁶ See generally *Neles-Jamesbury, Inc. v. Valve Dynamics, Inc.*, 974 F. Supp. 964, 969 (S.D. Tex. 1997).

⁴⁷ See 15 U.S.C. § 1125(c).

⁴⁸ *Id.* § 1125(c)(1).

unlikely to cause consumers to think the Coca-Cola Company is selling the televisions so there is no trademark infringement. However, under dilution law a third party would be prohibited from using the COKE trademark to sell televisions. Such use of the mark would dilute or blur the consumer association between soft drinks and the COKE mark and thereby negatively impact the mark's uniqueness. Dilution can also occur if a third party uses a famous trademark to sell dissimilar goods which tarnish or negatively affect the reputation associated with the trademark.⁴⁹ For example, using a famous trademark to sell pornography could be prohibited under dilution law if it could negatively impact a mark's consumer reputation.

Despite the valuable property rights that attach to a trademark a robust public trademark domain exists. Trademark law protects the mental association between products and a mark rather than the mark per se. Use of a trademark in everyday speech among individuals is not restricted by trademark law. Trademark law only applies to the use of trademarks in commercial contexts.⁵⁰ However, even in a commercial context competitors are free to use a mark owned by another entity in comparative advertising.⁵¹ A mark can be freely used in news reports⁵² and in parodies⁵³ without the approval of the mark owner. Finally, under the functionality doctrine trademark rights are not assertable if the trademark covers a functional aspect of a product.⁵⁴ This is particularly relevant to non-traditional trademarks which can cover the shape or other characteristic of a product. For example, if the trademark is the color of a product it is not protectable if the color affects how the product actually works or if the color is an intrinsic property of the product.⁵⁵ Furthermore, under the aesthetic functionality doctrine a trademark, such as the color of a product, that would give the trademark

⁴⁹ *Id.* § 1125(c)(2)(C).

⁵⁰ *See* 15 U.S.C. § 1114(1) (2018) (requiring that trademark infringement involve a "use in commerce").

⁵¹ *Smith v. Chanel, Inc.*, 402 F.2d 562, 565–66 (9th Cir. 1968). *See also* 15 U.S.C. § 1125(c)(3)(A)(i).

⁵² 15 U.S.C. § 1125(c)(3)(B).

⁵³ *Id.* § 1125(c)(3)(A)(ii).

⁵⁴ *Qualitex Co. v. Jacobson Prods. Co.*, 514 U.S. 159, 164–65 (1995).

⁵⁵ *See generally id.*; *see also In re Owens-Corning Fiberglas Corp.*, 774 F.2d 1116, 1121, 1125–1128 (Fed. Cir. 1985) (holding that the color pink for fiberglass insulation was a valid trademark because it was source indicating and it did not serve a functional purpose).

owner a significant commercial advantage other than due to the reputation associated with the mark is not protectable under trademark law.⁵⁶

D. Common Law

At common law ideas are generally viewed as being in the public domain.⁵⁷ Nevertheless, the Supreme Court in *International News Service v. Associated Press* held that information in the form of news could be granted protection against misappropriation by a third party.⁵⁸ This decision was subsequently nullified by the Supreme Court⁵⁹ but some states recognize misappropriation as a common law state cause of action.⁶⁰ Despite the fact that actions for misappropriation of ideas are recognized by some state courts, such actions have been asserted with limited success.⁶¹

Ideas are also protectable via contractual agreements under a freedom of contract rationale.⁶² However, many courts restrict the use of contract by requiring that ideas subject to a valid contract must be both novel and well developed.⁶³ This means that ideas already in the public domain and undeveloped or abstract ideas are typically not proper subject matter for contractual agreements.⁶⁴ This suggests courts are wary of limiting the public domain by granting common law legal protection for ideas. Instead, they favor free access to ideas to encourage innovation and creativity.

⁵⁶ See *Deere & Co. v. FIMCO Inc.*, 239 F. Supp. 3d 964, 999 (W.D. Ky. 2017).

⁵⁷ *Desny v. Wilder*, 299 P.2d 257, 265 (Cal. 1956) (noting that the law generally does not grant property rights in ideas to authors).

⁵⁸ *Int'l News Service v. Associated Press*, 248 U.S. 215, 240–42 (1918).

⁵⁹ *Barclays Capital Inc. v. Theflyonthewall.com, Inc.*, 700 F. Supp. 2d 310, 332 (S.D.N.Y. 2010), *rev'd on other grounds*, 650 F.3d 876 (2d Cir. 2011).

⁶⁰ *Nat'l Basketball Ass'n v. Motorola, Inc.*, 105 F.3d 841, 850 (2d Cir. 1997) (misappropriation claim valid N.Y. state cause of action although action not satisfied under facts of this case).

⁶¹ Andrew Beckerman-Rodau, *Ideas and the Public Domain: Revisiting INS v. AP in the Internet Age*, 1 N.Y.U. J. OF INTELL. PROP. & ENT. L. 1, 4 (2011).

⁶² *Reeves v. Alyeska Pipeline Serv. Co.*, 926 P.2d 1130, 1142 (Alaska 1996) (contracting parties should be free to decide whether to contract for idea).

⁶³ *Tate v. Scanlan Int'l, Inc.*, 403 N.W.2d 666, 671 (Minn. Ct. App. 1987).

⁶⁴ *Id.*

E. Patent Law

The patent law lists very specific categories of subject matter eligible for utility patent protection.⁶⁵ Those categories are process,⁶⁶ machine,⁶⁷ manufacture,⁶⁸ or composition of matter.⁶⁹ Historically, courts have broadly construed these statutory categories so few inventions fail to fall under at least one category.⁷⁰ In the seminal case of *Diamond v. Chakrabarty*, the Supreme Court addressed whether a living microorganism created in a laboratory was patent eligible subject matter.⁷¹ The court held it was within the statutory categories⁷² and noted that the Congressional legislative intent was that the statutory categories were meant “to include anything under the sun that is made by man.”⁷³ Hence, the fact that something is alive does not bar patent eligibility.⁷⁴ The Federal Circuit rejected longstanding precedent

⁶⁵ 35 U.S.C. § 101 (2018).

⁶⁶ *Id.* § 100(b) (“The term ‘process’ means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.”).

⁶⁷ *Burr v. Duryee*, 68 U.S. 531, 570 (1863) (“A machine is a concrete thing, consisting of parts, or of certain devices and combination of devices.”).

⁶⁸ *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980) (quoting *Am. Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931)) (“[A manufacture is] the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.”).

⁶⁹ *Id.* (quoting *Shell Dev. Co. v. Watson*, 149 F. Supp. 279, 280 (D.D.C. 1957)) (“[A composition of matter covers] all compositions of two or more substances and . . . all composite articles, whether they be the results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids.”).

⁷⁰ See generally Richard S. Gruner, *Intangible Inventions: Patentable Subject Matter for an Information Age*, 35 LOY. L.A. L. REV. 355, 380–81 (2002) (noting courts have so broadly construed categories of patent eligible subject matter that they provide little guidance with regard to the minimum requirements for an invention to be patent eligible); see also *CLS Bank Int’l v. Alice Corp.*, 717 F.3d 1269, 1276 (Fed. Cir. 2013) (“ . . . Congress intended that the statutory categories would be broad and inclusive to best serve the patent system’s constitutional objective of encouraging innovation.”), *aff’d*, 573 U.S. 208 (2014); CRAIG ALLEN NARD, *THE LAW OF PATENTS* 452, 476–78 (2d ed. 2011) (historically, whether an invention is patent eligible has not been a significant impediment to obtaining a patent).

⁷¹ 447 U.S. at 305–06.

⁷² *Id.* at 318.

⁷³ *Id.* at 309.

⁷⁴ See, e.g., U.S. Patent No. 4,736,866 (issued April 12, 1988) (patent on genetically engineered mouse with a predisposition to cancer which was used for research). Many, but not all, foreign countries agree with the U.S. approach of allowing patents on living things. See, e.g., Harvard Coll.

and held that methods of doing business were patent eligible.⁷⁵ This holding was subsequently recognized via statutory law⁷⁶ so the U.S. Supreme Court, somewhat reluctantly, acquiesced in this result.⁷⁷

Patent law has long recognized that some discoveries are too fundamental or basic to be patent eligible subject matter.⁷⁸ Although such a limitation is not expressly contained in patent law Section 101, the Supreme Court has repeatedly acknowledged that such a limitation exists.⁷⁹ Typically, the court has stated that abstract ideas, laws of nature and natural phenomena are

v. Canada, [2002] 4 S.C.R. 45, *reprinted in part in* NARD, *THE LAW OF PATENTS* 201–11 (4th ed. 2017) (mouse in U.S. Patent No. 4,736,866 found to be patent ineligible subject matter under Canadian law). Likewise, article 27(3)(b) of the TRIPS Agreement, which is an international intellectual property agreement, allows member countries to individually decide whether to grant patent protection on living plants and animals other than micro-organisms. Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 27(3)(b), Apr. 15, 1994, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (available at https://www.wto.org/english/docs_e/legal_e/27-trips_04c_e.htm#5 (visited May 10, 2019)); *Overview: the TRIPS Agreement*, WORLD TRADE ORGANIZATION, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm (last visited May 10, 2019) (overview of agreement); *see also* 35 U.S.C. § 161 (allows U.S. patents on asexually reproduced plants); *but see* NARD, *supra* note 70 at 201 (U.S. patent law bars patents on human organisms).

⁷⁵ *See* State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368, 1375 (Fed. Cir. 1998). *See also* ROGER E. SCHECHTER & JOHN R. THOMAS, *INTELLECTUAL PROPERTY – THE LAW OF COPYRIGHTS, PATENTS AND TRADEMARKS* § 14.7 at 308–10 (2003).

⁷⁶ *See* *Bilski v. Kappos*, 561 U.S. 593, 607 (2010) (“federal law [35 U.S.C. § 273(b)(1) (2006)] explicitly contemplates the existence of at least some business method patents” by recognizing a prior use defense for infringement of some methods of conducting business). This statutory defense was subsequently amended so that it was not limited to methods of doing business. *See* 35 U.S.C. § 273(a) (2019).

⁷⁷ *See* *Bilski*, 561 U.S. at 608 (noting that “some business method patents raise special problems in terms of vagueness and suspect validity”). *See also* *eBay, Inc. v. MercExchange, LLC*, 547 U.S. 388, 397 (2006) (Kennedy, J., concurring) (referring negatively to the “potential vagueness and suspect validity of some [business method] patents”).

⁷⁸ *See* *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014) (finding that building blocks of human ingenuity are not patent eligible); *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013) (finding that basic tools of science not patent eligible); *Chakrabarty*, 447 U.S. at 309 (“[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are ‘manifestations of . . . nature, free to all men and reserved exclusively to none.’”); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”).

⁷⁹ *E.g.*, *Alice*, 573 U.S. at 216.

ineligible for patent protection.⁸⁰ Recent decisions have noted that these categories of ineligible subject matter are exceptions to the subject matter covered by Section 101.⁸¹ The source of these exceptions has not been made explicit by the Supreme Court. Hence, it is unclear if the court is engrafting common law exceptions onto the statute, finding them to be policy-based exceptions dictated by the patent law statute or announcing constitutionally-based exceptions. Nevertheless, these exceptions apply even if the inventive subject matter is novel, took substantial time and effort to discover or has great economic value.⁸² This basic concept is not unique to patent law. Copyright law likewise distinguishes between uncopyrightable ideas and the copyrightable form of expression of those ideas.⁸³ In patent law it is oft stated that ideas are not patentable, but embodiments of ideas are patentable.⁸⁴ Finally, common law protection of ideas contains the analogous distinction. A common law action for misappropriation of an idea typically requires the idea to be sufficiently developed before it can be the basis of an action.⁸⁵ This requirement is referred to by courts as the concreteness requirement.⁸⁶ A similar requirement often applies to breach of contract actions in idea disputes.⁸⁷ Hence, neither misappropriation nor contract actions for abstract ideas are typically permitted by courts.

⁸⁰ *Id.*

⁸¹ *See, e.g., Myriad Genetics*, 569 U.S. at 589.

⁸² *See generally In re Chatfield*, 545 F.2d 152, 157 (C.C.P.A. 1976) (“Some inventions, however meritorious, do not constitute patentable subject matter.”). *See also Myriad Genetics*, 569 U.S. at 591 (“Groundbreaking, innovative, or even brilliant discovery does not by itself satisfy the § 101 inquiry.”); *Roche Molecular Sys., Inc. v. Cepheid*, 905 F.3d 1363, 1371 (Fed. Cir. 2018) (holding invention not patent eligible despite stating it was a valuable contribution to science and medicine); *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379–80 (Fed. Cir. 2015) (significant contribution to medical science does not by itself render invention patent eligible).

⁸³ *See, e.g., Atari, Inc. v. Amusement World, Inc.*, 547 F. Supp. 222, 228 (D. Md. 1981).

⁸⁴ *See, e.g., Panduit Corp. v. Stahl Bros. Fibre Works*, 575 F.2d 1152, 1159 n.7 (6th Cir. 1978).

⁸⁵ *See, e.g., Sellers v. Am. Broad. Co.*, 668 F.2d 1207, 1210 (11th Cir. 1982).

⁸⁶ *Tate v. Scanlan Int’l, Inc.*, 403 N.W.2d 666, 672 (Minn. Ct. App. 1987) (“Concreteness of an idea pertains to the requisite developmental stage of the idea when it is presented. An idea is a protectable property interest, if it is sufficiently developed to be ready for immediate use without additional embellishment. If an idea requires extensive investigation, research, and planning before it is ripe for implementation, it is not concrete.” (internal citations omitted)).

⁸⁷ *Id.* at 671.

This carving out of abstract ideas as unprotectable subject matter represents the recognition of a public domain or public commons for certain basic information. It is necessary that such information remain publicly accessible for a variety of reasons. It is important in an open democratic society that fundamental facts and other basic information are available to everyone in order to facilitate independent and fully informed decision-making by societal members. This necessitates denying ownership of such information to any individual or entity in order to further the unfettered flow of information. Moreover, creative and innovative activities are invariably based upon what others have previously done. A public domain of fundamental knowledge is therefore needed for innovation and creativity to flourish. Private ownership of certain basic knowledge or information can retard or impede innovative and creative activities which can reinforce continuation of the status quo.

In contrast, a capitalist economic system only thrives if societal members are incentivized to engage in profit enhancing activities. Patent law is premised on this concept by granting property rights to inventors who discover or create innovations.⁸⁸ Absent property protection third party free-riders would often be able to copy such innovations. This would deprive the inventor of the possibility of earning revenue from such innovations because the free-rider could typically undersell the inventor since they would not have to recoup the development costs expended by the inventor.

Accommodating both the need for a public commons of information free for all to use and the need to provide an economic incentive for creative and innovative activities requires drawing a line between information that is free from legal property protection and information that can be subject to private ownership. This distinction is well recognized in the case law which has interpreted patent law for centuries.⁸⁹ In applying patent law, the Supreme Court historically refers to information that should be in the public domain as fundamental truths, mental processes or steps, abstract principles, laws of nature, physical phenomena, or abstract ideas.⁹⁰ In the context of patent law Section 101, such public domain information is referred to as patent ineligible

⁸⁸ See *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980).

⁸⁹ See, e.g., *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216–217 (2014).

⁹⁰ *Id.*

subject matter, whereas patentable subject matter is referred to as patent eligible subject matter.⁹¹

Determining the dividing line between patentable subject matter and unpatentable subject matter can only be done with an understanding of the basic policy or purpose of patent law. Ultimately, patent law's constitutional mandate, frequently stated by the Supreme Court, is to benefit the public by increasing the public storehouse of knowledge.⁹² Providing property rights to inventors in the form of patents is the economic incentive for individuals and enterprises to engage in creative endeavors⁹³ but the ultimate goal is to increase the public storehouse of information with their creative activities.⁹⁴ In light of these policies a patent should not be viewed solely as an economic reward for the time and effort invested in discovering new information and technological solutions. A great technological discovery that took years to ascertain and significant economic resources will not be patent eligible if it falls into subject matter destined for the public domain.

The test for determining what subject matter falls within the statutory categories listed in patent law Section 101 must therefore draw a line between discoveries whose ownership would impede future innovation (and therefore be patent ineligible)⁹⁵ and discoveries whose ownership would incentivize future innovation (and therefore be patent eligible). Alternatively, the test should seek to minimize patent eligible subject matter while maximizing creative incentives. Any such line drawing will be inexact and subject to either over-inclusion or under-inclusion. Nevertheless, the numerous Supreme Court decisions that have examined this issue mandate such a line drawing.

⁹¹ Compare *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016), with *Chamberlain Grp., Inc. v. Linear LLC*, 114 F. Supp. 3d 614, 627 (N.D. Ill. 2015).

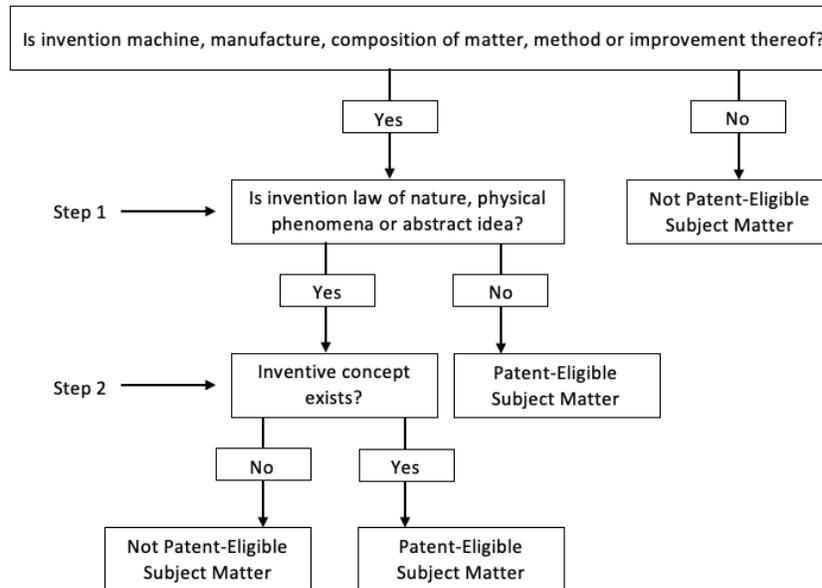
⁹² See, e.g., *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 151 (1989) (noting that the "ultimate goal of the patent system is to bring new designs and technologies into the public domain through disclosure").

⁹³ *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 229 (1964) (patents granted to encourage inventive activity).

⁹⁴ See generally *Seymour v. Osborne*, 78 U.S. 516, 533–34 (1870) (patents granted to inventors to compensate them for their work which results in invention that benefits public).

⁹⁵ *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (patent law should not impede future innovation by tying up the fundamental building blocks of human creativity and innovation).

Developing and applying a consistent test to facilitate this line drawing falls to the lower courts who actually hear all patent disputes. The Court of Appeals for the Federal Circuit, which hears all patent appeals from U.S. District Courts, has held that the Supreme Court requires application of the following test which is shown below in flowchart format.⁹⁶



Many commentators⁹⁷ and industry groups are dissatisfied with the above test. Some of this unhappiness with current patent law jurisprudence

⁹⁶Trading Techs. Int'l, Inc. v. IBG LLC, 921 F.3d 1378, 1383–84 (Fed. Cir. 2019) (“The Supreme Court has established a two-step framework for ‘distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.’ ‘First, we determine whether the claims at issue are directed to’ a patent-ineligible concept. If so, ‘we consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.’” [citations omitted]). As shown in the flowchart, courts typically refer to the labeled questions as step one and step two. See, e.g., *In re Villena*, 745 F. App’x 374, 376 (Fed. Cir. 2018); *Ariosa Diagnostics*, 788 F.3d at 1375.

⁹⁷See, e.g., Jerry I-H Hsiao, *Patent Eligibility of Predictive Algorithm in Second Generation Personalized Medicine*, 22 SMU SCIENCE & TECH. L. REV. 23 (2019).

emanates from the biomedical industry; specifically, from companies that develop diagnostic tests for detecting medical conditions.⁹⁸ Such companies spend considerable amounts of money developing such tests and understandably seek patent protection for the tests. They are not concerned with public policy issues such as maintaining a public domain of fundamental knowledge. In fact, they seek to minimize what is in the public domain by maximizing what is subject to private property ownership pursuant to a patent. Such ownership allows the test developer to recoup development costs and maximize the economic return from marketing and selling the tests. This has been particularly problematic with regard to development of diagnostic tests because the underlying basis for such tests is often discovery of some naturally occurring relationship such as the presence of a particular substance in a person's blood which correlates with a specific disease or medical condition. Correlations of this type can be very valuable and may be the result of extensive research activities. Nevertheless, they are typically in the realm of fundamental or foundational knowledge that should be in the public domain and beyond the scope of patent protection.⁹⁹

Much of the handwringing over the problems with the state of patent eligibility law is based on several factors. First and foremost is impatience. Legal doctrine evolves slowly on a case-by-case basis. This enables courts to consider the different fact scenarios and policy considerations that are often unforeseeable until real life disputes evolve into judicial disputes.

⁹⁸ *Id.* at 37.

⁹⁹ Alternatively, a diagnostic test developer, in an appropriate situation, may be able to rely on trade secret law to recoup investment in developing the test. *See* Uniform Trade Secrets Act §§ 1–12 (1985), available at <http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf> (last visited Dec. 5, 2019) (adopted by 49 states) (state trade secret law); *see also* 18 U.S.C. §§ 1831–39 (2018) (federal trade secret law). In some situations, collecting data from the test results may be amenable to trade secret protection and information gleaned from amassing such data may give the test developer an economic advantage over others who market the same or similar tests. *See generally* Robert G. Bone, *From Property to Contract: The Eleventh Amendment and University-Private Sector Intellectual Property Relationships*, 33 *LOY. L.A. L. REV.* 1467, 1505 n.133 (2000) (trade secret protection may be an alternative to patent protection).

Trade secret law is a more robust source of action today in light of the recent creation of a private federal cause of action for trade secret misappropriation. *See* 18 U.S.C. § 1836(b). Such federal actions coexist with preexisting state actions for misappropriation of a trade secret. Nevertheless, trade secret law only bars misappropriation of the information from the trade secret owner. It does not bar reverse engineering or independent development of the information. *See generally* *Opus Fund Servs. (USA) LLC v. Theorem Fund Servs., LLC*, No. 17 C 923, 2018 U.S. Dist. LEXIS 35569, *10 (N.D. Ill. Mar. 5, 2018) (independent development or reverse engineering not improper means of acquiring a trade secret).

Nevertheless, our modern society often demands instant resolution of problems, which is contrary to the slow process of legal disputes percolating through the legal system. As precedents accrue in the normal course of case law development, general rules will become apparent and necessary exceptions to those rules will be created. Objective factors that can aid courts in inferring particular conclusions will also become apparent. As the body of relevant case law increases in size, courts will be able to analogize between new disputes and precedent. This process takes time to occur but it is the only way a coherent body of applicable law will develop.

A second critical factor is unrealistic expectations. Few, if any, critics of the above test for determining if subject matter is a patent-eligible invention have proposed a better test. This reflects the fact that a perfect all-encompassing test is unlikely to exist. Virtually all legal tests fail to clearly resolve all legal disputes. Frequently, such tests are under-inclusive or over-inclusive. Additionally, underlying policy considerations can dictate inapplicability of an otherwise relevant legal test under certain circumstances.

Finally, complexity of the subject matter involved makes addressing patent eligibility inherently difficult. The law is attempting to apply concrete rules to intangible subject matter. This is a common issue in intellectual property law generally.¹⁰⁰ For example, copyright law courts struggle with distinguishing between ideas that are unprotectable and the protectable form of expression of the idea.¹⁰¹ Likewise, courts sometimes have significant difficulty determining when use of a copyrighted work is a fair use and therefore immune from an action for infringement.¹⁰²

In the patent realm courts struggle with analyzing claim scope. Using the patent specification to limit a claim is impermissible but using the specification to narrowly define a claim term is permissible.¹⁰³ The difference between limiting and defining is often difficult to discern. Likewise, the

¹⁰⁰ See generally 35 U.S.C. § 101 (2018) (subject matter of a patent), 15 U.S.C. § 1051 (2018) (subject matter of a trademark), and 17 U.S.C. § 102 (2018) (subject matter of copyright).

¹⁰¹ *Kepner-Tregoe, Inc. v. Leadership Software, Inc.*, 12 F.3d 527, 533–34 (5th Cir. 1994).

¹⁰² *Princeton Univ. Press v. Mich. Document Servs., Inc.*, 99 F.3d 1381, 1390 (6th Cir. 1996). See generally Kenneth D. Crews, *The Law of Fair Use and the Illusion of Fair-Use Guidelines*, 62 OHIO ST. L.J. 599 (2001), for a discussion of the difficulty in determining fair use.

¹⁰³ *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1347 (Fed. Cir. 2004) (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000)). See *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1370 (Fed. Cir. 2003).

patent specification satisfies the enablement requirement¹⁰⁴ if someone having ordinary skill in the relevant technology area does not have to engage in undue experimentation to make and use the invention described.¹⁰⁵ How much experimentation is necessary before it is deemed undue experimentation is often a difficult distinction to ascertain. Typically, courts rely on a list of objective factors to reach their conclusion.¹⁰⁶

Whether prior art is analogous or non-analogous art for an obviousness analysis can be unclear.¹⁰⁷ Under the relevant test art is analogous if it “is from the same field of endeavor, regardless of the problem addressed [by the inventor]” or if it is not from “the inventor’s [field of] endeavor . . . [it] is reasonably pertinent to the particular problem with which the inventor is involved.”¹⁰⁸ Often the result is dictated by how the court characterizes the invention.¹⁰⁹

A conventional patent infringement action, typically called literal infringement, requires every element and limitation contained in the patent claim to be present in the infringing invention.¹¹⁰ Nevertheless, under certain circumstances a device clearly falling outside the claim scope can be treated as infringing under the judicially created doctrine of equivalents.¹¹¹ Additionally, determining whether the preamble of a patent claim limits the scope of a patent claim can be unclear.¹¹² The test articulated by the Federal Circuit states that “a preamble [generally] limits the invention if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.”¹¹³ In contrast it does not limit the claim “where a

¹⁰⁴ 35 U.S.C. § 112(a) (2018).

¹⁰⁵ See *Auto. Techs. Int’l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1282 (Fed. Cir. 2007) (quoting *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244 (Fed. Cir. 2003)).

¹⁰⁶ See *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

¹⁰⁷ *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019).

¹⁰⁸ *Id.* (quoting *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)).

¹⁰⁹ See *Airbus S.A.S.*, 941 F.3d at 1380.

¹¹⁰ *Larami Corp. v. Amron*, 27 U.S.P.Q.2d 1280, 1283 (E.D. Pa. 1993).

¹¹¹ *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997).

¹¹² Compare *In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) (holding claim preamble limits claim), with *Arctic Cat Inc. v. GEP Power Prods., Inc.*, 919 F.3d 1320, 1322 (Fed. Cir. 2019) (holding claim preamble does not limit claim).

¹¹³ *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)).

patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.”¹¹⁴

II. REVIEW OF FEDERAL CIRCUIT CASE LAW

This paper will next address the empirical question of whether the above test has produced uniform and predictable results by reviewing and analyzing recent decisions of the Federal Circuit that have addressed the issue of whether a particular invention is patent eligible subject matter under Section 101.

From a macro view, a significant number of recent decisions addressing the issue have found the contested subject matter to be patent ineligible.¹¹⁵ This may reflect early attempts by litigants to both establish how the test will be actually applied in practice and to push the limits of patentable subject matter as this area of law develops. It may also reflect the significant economic interests of certain industries which are tied to or affected by patents. For example, companies competing in the life sciences sector are heavily dependent upon patents and therefore it is unsurprising that a significant number of patent disputes involving Section 101 patent eligibility involves this industry.¹¹⁶ An even larger number of disputes involve the computer hardware and software sectors.¹¹⁷ Again this is expected due to the substantial licensing fees many entrants in these industries potentially have to pay to produce and sell products covered by numerous patents.

It should be noted that rejection of patent applications and invalidation of issued patents because they claim ineligible subject matter does not automatically reflect an existential problem with either the patent law or the judicial system. Litigants are solely interested in maximizing the value of their private property in the form of patents by obtaining the broadest patent claims possible. The courts, in contrast to patent owners, are charged with maintaining the public domain of information. As a result, courts are forced to respond to increasingly overly broad claims by finding them covering patent ineligible subject matter. This is perhaps more of a contemporary concern in light of the ever-expanding sphere of potentially patentable subject matter being pursued by inventors. The more the realm of patent

¹¹⁴ *Id.* (quoting *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)).

¹¹⁵ *See infra* Part II.

¹¹⁶ *See infra* Part II.(a).

¹¹⁷ *See infra* Part II.(b).

eligible subject matter increases the more likely it is to encroach upon this public domain.

Nevertheless, the number of patent eligibility challenges should decrease as the body of case law expands. At some point the case law will coalesce into a relatively uniform and predictable body of law that contains objective criteria that can be evaluated in order to make reasonable predictions with regard to whether a patent claim is directed to ineligible subject matter. Difficult cases at the margins will still be litigated but that is to be expected.

A. Life Sciences

In *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, two scientists discovered the presence of a naturally occurring substance in the blood of pregnant women that could be used to diagnose fetal characteristics such as gender or the existence of genetic abnormalities.¹¹⁸ The finding was a surprising and valuable discovery¹¹⁹ which formed the basis of a diagnostic test that was commercialized.¹²⁰ A resulting patent claimed methods of detecting the substance and of altering it such that it could form the basis for a diagnostic test.¹²¹ However, all of the steps for detecting and manipulating the substance were conventional steps known to those skilled in the art.¹²² As a result, the real discovery being claimed was the previously unknown presence of a naturally occurring substance in maternal blood.¹²³ The court held this was a natural phenomenon which was not patent eligible.¹²⁴

Infection from a specific bacterium (MTD) is a major cause of the disease tuberculosis.¹²⁵ Existing tests for this bacterium were slow and didn't detect if the bacterium was antibiotic resistant.¹²⁶ In *Roche Molecular Systems, Inc. v. CEPHEID*, two inventors discovered that MTD had a unique natural genetic signature which could be rapidly detected.¹²⁷ This allowed for a faster

¹¹⁸ *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1373 (Fed. Cir. 2015).

¹¹⁹ *Id.* at 1376, 1380.

¹²⁰ *Id.* at 1373.

¹²¹ *Id.* at 1373–74.

¹²² *Id.* at 1377–78.

¹²³ *Id.* at 1377.

¹²⁴ *Id.* at 1373.

¹²⁵ *Roche Molecular Sys. v. Cepheid*, 905 F.3d 1363, 1365 (Fed. Cir. 2018).

¹²⁶ *Id.*

¹²⁷ *Id.* at 1365–66.

test for detecting the presence of MTD which could also predict if the MTD was antibiotic resistant.¹²⁸ The inventors claimed the primers used to identify the presence of MTD¹²⁹ but these claims were found to be patent ineligible because the primers were indistinguishable from naturally occurring DNA.¹³⁰ A method of detecting MTD was also claimed.¹³¹ This was also found to be unpatentable because the existence of the bacterium in a DNA sample was a natural phenomenon and the PCR technique used to identify the unique DNA signature of the bacterium was a standard conventional use of existing PCR technology.¹³²

Cleveland Clinic Found. v. True Health Diagnostics LLC involved patents that claim a diagnostic test for assessing a person's risk of coronary artery disease.¹³³ The method claims were based on the discovery that people with coronary artery disease have significantly high levels of a specific protein (MPO) in their blood.¹³⁴ The claims were all directed to methods of identifying and detecting the presence of MPO in a person's blood.¹³⁵ Additionally, the methods of ascertaining the presence of MPO were known techniques used in standard ways.¹³⁶ Again, the claims were found patent ineligible.¹³⁷

In *Athena Diagnostics, Inc. v. Mayo Collaborative Services, LLC* the inventors discovered a new method of diagnosing a neurological disorder called myasthenia gravis (MG).¹³⁸ It was based on the discovery that a specific substance was present in the bodily fluid of individuals suffering from MG.¹³⁹ Known conventional techniques were then used to detect the

¹²⁸ *Id.* at 1366.

¹²⁹ *Id.* at 1367.

¹³⁰ *Id.* at 1369.

¹³¹ *Id.* at 1366–67.

¹³² *Id.* at 1374.

¹³³ *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 760 F.App'x 1013, 1015 (Fed. Cir. 2019).

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ *Id.* at 1019.

¹³⁷ *Id.* at 1014–15.

¹³⁸ *Athena Diagnostics, Inc. v. Mayo Collaborative Services, LLC*, 915 F.3d 743, 747 (Fed. Cir. 2019).

¹³⁹ *Id.*

presence of the specific substance in bodily fluid.¹⁴⁰ The claims were found to be directed to ineligible subject matter.¹⁴¹

Ino Therapeutics LLC v. Praxair Distribution Inc. deals with a portfolio of patents for treating infants with hypoxic respiratory failure by providing inhaled nitric oxide gas.¹⁴² Administration of 20 ppm of the gas was a known treatment for infants suffering from this respiratory affliction.¹⁴³ The inventors observed, however, that providing the treatment could trigger a life-threatening event¹⁴⁴ in patients who have left ventricular dysfunction in addition to hypoxic respiratory failure.¹⁴⁵ The patent claim at issue covers the known medical treatment with the limitation that it should not be used on infant patients who have left ventricular dysfunction.¹⁴⁶ Hence, the claim was really directed to the natural phenomenon that administering the gas to a particular group of patients could be fatal and therefore step one was satisfied.¹⁴⁷ Likewise, under step two, the claim does not recite an inventive concept.¹⁴⁸ It does not claim a new method of administering the gas or a new method of identifying or treating patients with hypoxic respiratory failure.¹⁴⁹ Moreover, it does not disclose a new method of identifying or treating patients with left ventricular dysfunction.¹⁵⁰

The *Ariosa Diagnostics*, *Roche Molecular Systems*, *Cleveland Clinic Foundation*, *Athena Diagnostics* and *Ino Therapeutics LLC* cases all deal with discovering either a natural characteristic of a human body or the natural presence of a substance in bodily fluid. These discoveries could be valuable and in most cases could be used to develop diagnostic tests for finding medical conditions or abnormalities. Hence, a patent on these things could prove to be valuable building blocks of a diagnostic testing business. Nevertheless, these discoveries all represent basic scientific information

¹⁴⁰ *Id.* at 757.

¹⁴¹ *Id.*

¹⁴² *Ino Therapeutics LLC v. Praxair Distribution Inc.*, 782 F.App'x 1001, 1002 (Fed. Cir. 2019).

¹⁴³ *Id.* at 1002.

¹⁴⁴ *Id.* at 1002–03.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ *Id.* at 1009–10.

¹⁴⁸ *Id.* at 1011.

¹⁴⁹ *Id.* at 1009.

¹⁵⁰ *Id.* at 1009–10.

which is the type of fundamental knowledge that should be kept within the public domain rather than being privately owned property.

In contrast to the above cases, *Rapid Litigation Management Ltd. v. CellzDirect, Inc.* found the subject matter at issue to be patent eligible.¹⁵¹ It was known that a certain type of live liver cell called a hepatocyte could be used to test the effect of drugs on the liver.¹⁵² However, live hepatocytes had limited availability and only limited lifespans¹⁵³ but for research purposes pools of viable hepatocytes from multiple different livers were needed.¹⁵⁴ This meant that cells from individual livers were typically frozen.¹⁵⁵ When enough different liver cells existed they were thawed and combined to produce a pool from which viable cells could be recovered and used for research.¹⁵⁶ It was commonly believed that the cells could only be frozen a single time so any viable cells not used after thawing were discarded.¹⁵⁷ Additionally, the freezing process damaged the cells which reduced the amount of viable cells that could be obtained after thawing.¹⁵⁸ The inventors discovered that hepatocytes could be subject to two freeze-thaw cycles.¹⁵⁹ They claimed the method of thawing multiple frozen cells, separating out viable cells and then refreezing the pool of viable cells.¹⁶⁰ Subsequently, the pool of viable cells could be thawed and used for research without having to engage in the additional step of identifying viable cells.¹⁶¹ The district court concluded under step one that the method claimed was directed to the law of nature that the cells could be subject to two freeze-thaw cycles.¹⁶² And, that under step two conventional steps were used to implement the method.¹⁶³ The Federal Circuit disagreed and held that the method was not directed to a

¹⁵¹ *Rapid Litigation Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1044 (Fed. Cir. 2016).

¹⁵² *Id.* at 1045.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ *Id.* at 1045–46.

¹⁶¹ *Id.* at 1045.

¹⁶² *Id.* at 1046.

¹⁶³ *Id.*

natural law of nature.¹⁶⁴ It concluded that the inventors claimed a new method for preserving hepatocytes and therefore the method was patent eligible under step one.¹⁶⁵ The court noted, however, that even if step two was applied it would be satisfied.¹⁶⁶ However, the court's reasoning seems questionable in light of the fact that it focused on the benefits and advantages of the invention¹⁶⁷ even though all the steps of the method were conventional. Arguably, the only real discovery was that liver cells could be subjected to two freeze-thaw cycle without destroying their use for research.

The following two cases deal with discovery of fundamental knowledge. Nevertheless, the court found patent eligible subject matter in both cases.

In *Vanda Pharmaceuticals Inc. v. West-Ward Pharmaceuticals International Ltd.* it was known that patients with schizophrenia could be treated by administering the drug iloperidone.¹⁶⁸ It was also known that certain patients had an increased cardiac health risk from taking this drug because their bodies did not effectively metabolize the drug.¹⁶⁹ It was discovered that a genetic difference in some patients would identify them as poor or ineffective metabolizers of the drug.¹⁷⁰ The resulting patent claimed a method of adjusting a patient's iloperidone dosage based on whether they had been identified as a poor metabolizer or a normal metabolizer.¹⁷¹ Although the basic discovery underlying the claim was identification of a specific natural genetic difference in certain people and its correlation with poor metabolization of iloperidone, the court focused on the fact that the claim was for a method of treating a disease rather than the mere correlation.¹⁷² Nevertheless, this distinction seems misplaced in light of the fact that all the steps of the claim were routine and conventional.¹⁷³ Hence, it can be argued that this claim should have been held to be patent ineligible subject matter.¹⁷⁴

¹⁶⁴ *Id.* at 1048.

¹⁶⁵ *Id.*

¹⁶⁶ *Id.* at 1050.

¹⁶⁷ *Id.* at 1050–51.

¹⁶⁸ *Vanda Pharm. Inc. v. West-Ward Pharm. Int'l Ltd.*, 887 F.3d 1117, 1121 (Fed. Cir. 2018).

¹⁶⁹ *Id.*

¹⁷⁰ *Id.*

¹⁷¹ *Id.*

¹⁷² *Id.* at 1135.

¹⁷³ *See generally id.* at 1143 (Prost, C.J., dissenting).

¹⁷⁴ *See id.* at 1140.

In *Endo Pharmaceuticals Inc. v. Teva Pharmaceuticals, USA, Inc.* the inventor claimed a method of treating pain in patients with decreased kidney function.¹⁷⁵ Specifically, the inventor discovered that patients with impaired kidney function could be given a lower dosage of oxymorphone than the standard dosage given to patients not having impaired kidney function.¹⁷⁶ The patients with impaired function would then have the same pain relief as someone with normal functioning kidneys despite the lower dose.¹⁷⁷ The lower court concluded that the method was patent ineligible because it relied on a law of nature.¹⁷⁸ Namely, that the bioavailability of oxymorphone increases in people with severe kidney impairment.¹⁷⁹ And, that the remaining steps of the claim amount to routine and conventional activities.¹⁸⁰ On appeal the Federal Circuit reversed¹⁸¹ and held that the method claim was directed to a patent eligible method of treating pain in patients with kidney impairment.¹⁸² The Federal Circuit decision relied on precedent that held methods of treating a disease were patent eligible subject matter.¹⁸³ Nevertheless, it can be argued that the result is incorrect in light of the fact that the crux of the discovery was solely the inverse relationship between the amount of the oxymorphone ingested and the amount of pain relief for patients with impaired kidney function.

Vanda Pharmaceuticals and *Endo Pharmaceuticals* indicate the Federal Circuit is drawing a clear line between eligible and ineligible subject matter in the context of pharmaceutical inventions. If a discovery leads to a method of treating a medical condition a claim to that method is patent eligible. However, the claim to the discovery itself is patent ineligible. This distinction, in part, led to the conclusion in the following case that the invention was patent eligible.

In *Natural Alternatives International, Inc. v. Creative Compounds, LLC* the invention is premised on the finding that increasing the amount of a natural substance—the amino acid beta-alanine—in a person’s bloodstream can

¹⁷⁵ *Endo Pharm. Inc. v. Teva Pharm., USA, Inc.*, 919 F.3d 1347, 1348 (Fed. Cir. 2019).

¹⁷⁶ *Id.* at 1349.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* at 1351–52.

¹⁷⁹ *Id.* at 1352.

¹⁸⁰ *Id.* at 1351–52.

¹⁸¹ *Id.* at 1357.

¹⁸² *Id.* at 1353.

¹⁸³ *Id.* at 1353–56.

have certain beneficial effects on the person.¹⁸⁴ The patents at issue include method claims that essentially claim taking an amount of the amino acid to have the beneficial effect.¹⁸⁵ The Federal Circuit reversed the district court's conclusion that these claims were directed to natural laws¹⁸⁶ and therefore were patent ineligible.¹⁸⁷ The Federal Circuit specifically noted that these method claims "cover using a natural product in unnatural quantities to alter a patient's natural state, to treat a patient with specific dosages outlined in the patents."¹⁸⁸ Based on this the Federal Circuit held that the claims were for methods of treatment and hence patent eligible.¹⁸⁹ The patents at issue also included product claims for food supplements comprising a combination of beta-alanine with other substances.¹⁹⁰ The resulting supplements exhibited characteristics that differed from the characteristics of beta-alanine in its natural state.¹⁹¹ Hence, the Federal Circuit found these product claims to be patent eligible.¹⁹² The conclusion that the product claims were patent eligible is consistent with Supreme Court precedents that found that products of nature that were modified by human intervention to have unnatural characteristics were patent eligible subject matter.¹⁹³ However, arguably, the Federal Circuit was incorrect in finding the method claims patent eligible. These claims merely cover taking a natural substance without any realistic limits or additional steps so they are not actually claiming a method of treatment.

B. Computer Hardware & Software

In *Trading Technologies International, Inc. v. IBG, LLC*, the patent claim at issue, at its most basic level, claimed displaying additional information on a prior art computer screen used by securities or commodities traders.¹⁹⁴ The

¹⁸⁴Natural Alternatives Int'l, Inc. v. Creative Compounds, LLC, 918 F.3d 1338, 1343–44 (Fed. Cir. 2019).

¹⁸⁵*Id.*

¹⁸⁶*Id.* at 1344.

¹⁸⁷*Id.*

¹⁸⁸*Id.* at 1346.

¹⁸⁹*Id.* at 1345.

¹⁹⁰*Id.* at 1348.

¹⁹¹*Id.*

¹⁹²*Id.* at 1349.

¹⁹³*See, e.g.,* Diamond v. Chakrabarty, 447 U.S. 303, 310 (1980).

¹⁹⁴*Trading Technologies Int'l, Inc. v. IBG, LLC*, 921 F.3d 1378, 1381 (Fed. Cir. 2019).

displayed information could then be used by traders to presumably make more informed or efficient trades. Under step one of the preceding flowchart, the court held that “providing a trader with additional financial information to facilitate market trades [was an] abstract idea.”¹⁹⁵ The court then addressed, pursuant to step two of the above flowchart, whether the actual claim elements added an inventive concept that converted the abstract idea into a patent eligible invention.¹⁹⁶ The court noted that the claim elements describe displaying profit and loss data, that is well-known financial data computable via prior art methods, in combination with other well-known data on a prior art computer screen. Regardless of how useful or valuable consolidating all of this data on one computer screen might be the court found no inventive concept under step two and therefore concluded that the claimed subject matter was patent ineligible.¹⁹⁷

In re Villena involves a patent application claiming the use of conventional computer technology to display a map of real estate property values in a specified geographic area.¹⁹⁸ The idea of visually displaying information is the same abstract idea claimed in *Trading Technologies International, Inc.* The only difference is the type of data displayed. Likewise, both inventions were held to apply to patent ineligible subject matter.

In re Greenstein involves a patent application claiming a method of receiving unbiased recommendations for goods/services via the internet.¹⁹⁹ It does not contain any steps for specifically creating or acquiring such unbiased recommendations nor does it require the use of non-conventional computer equipment. Hence, the court correctly finds the claims directed to an abstract idea that is patent ineligible subject matter.²⁰⁰

Clearly, the above courts reached the correct result that receiving conventional data via the internet, or displaying well-known information or data on a conventional computer display is not patent eligible subject matter. Likewise, merely receiving or displaying data generally via any known medium is unlikely to be patent eligible. In contrast, a totally unique method

¹⁹⁵ *Id.* at 1384.

¹⁹⁶ *Id.* at 1385 (quoting *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167 (Fed. Cir. 2018)).

¹⁹⁷ *Id.*

¹⁹⁸ *In re Villena*, 745 F. App'x 374, 375 (Fed. Cir. 2018).

¹⁹⁹ *In re Greenstein*, 778 F. App'x 935, 937 (Fed. Cir. 2019).

²⁰⁰ *Id.* at 938–39.

of displaying data such as modifying a computer display so it can show data more rapidly or via using less energy might be patent eligible subject matter.

In *University of Florida Research Foundation, Inc. v. General Electric Co.* it was noted that multiple bedside machines are typically used to create uniquely formatted digital patient data in healthcare settings.²⁰¹ This data is then manually entered into a computerized data system to preserve it.²⁰² Such manual entry is both time consuming and prone to transcription error.²⁰³ The invention utilizes software to collect the data provided by the bedside machines and convert it into a standardized format which can then be displayed or stored.²⁰⁴ Specifically, a software driver is created for each bedside machine which reads the data from that machine and converts it into a standard format.²⁰⁵ Under step one, the invention is directed to an abstract idea because it merely uses a computer to accomplish a task that was previously done manually.²⁰⁶ Of particular importance is that the various steps of the claimed method rely on generic components that are merely described in conventional functional terms.²⁰⁷ Likewise, step two is not satisfied because the claim simply teaches utilizing generic computer components to carry out the invention.²⁰⁸ Essentially, the invention claims using a series of software drivers in combination with conventional computer hardware and software to convert proprietary software data into a standardized format. It does not require any unique software or modified hardware to carry out this conversion and hence is patent ineligible.

In *Solutran, Inc. v. Elavon, Inc.* the invention was a method of electronically processing conventional paper checks received by a merchant.²⁰⁹ The check data was captured by the merchant at the point of sale, and the amount of the check was then credited to the merchant's account.²¹⁰ Subsequently, the actual check was scanned to create an image of

²⁰¹ *Univ. of Florida Research Found., Inc. v. General Electric Co.*, 916 F.3d 1363, 1366 (Fed. Cir. 2019).

²⁰² *Id.* at 1367.

²⁰³ *Id.*

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *Id.* at 1368.

²⁰⁷ *Id.*

²⁰⁸ *Id.* at 1368–69.

²⁰⁹ *Solutran, Inc. v. Elavon, Inc.*, 931 F.3d 1161, 1163 (Fed. Cir. 2019).

²¹⁰ *Id.* at 1163–64.

the check that was matched with the previously captured check data.²¹¹ All of these steps were well-known²¹² so the invention was the fact that the merchant's account was credited with the amount of the check before the check was actually scanned into an electronic image.²¹³ The court held that this amounted to claiming an abstract idea²¹⁴ and that an inventive concept was lacking in light of the fact that all the steps of the claim were conventional well-known technology. Hence, the invention was patent ineligible subject matter.

In *ChargePoint, Inc. v. SemaConnect, Inc.*, the main thrust of the invention was networking electric vehicle charging stations via a computer network.²¹⁵ This would allow centralized control of local charging stations. This would permit, for example, a vehicle connected to a charging station to receive a charge or to transfer energy from the car's battery to the electric grid. The various claims included both apparatus²¹⁶ and method²¹⁷ claims, but they all claimed in broad functional language networked communication.²¹⁸ The only limitation on the abstract idea of networked communication was the limitation that it would apply in the context of electric vehicle charging stations.²¹⁹ The court found the claims directed to patent ineligible subject matter after holding that neither step one²²⁰ nor step two²²¹ was satisfied.

Chamberlain Group, Inc. v. Techtronic Industries Co. dealt with wireless devices for opening and closing garage doors.²²² One of the patents at issue claimed wirelessly transmitting the status of the garage door to the wireless device.²²³ The court noted that the use of wireless garage door openers and virtually all other aspects of the technology were known with the exception

²¹¹ *Id.* at 1164.

²¹² *Id.* at 1168 (“[S]teps of the claim are conventional processes for processing checks electronically.”).

²¹³ *Id.* at 1167.

²¹⁴ *Id.* at 1168.

²¹⁵ *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 763 (Fed. Cir. 2019).

²¹⁶ *Id.* at 764.

²¹⁷ *Id.*

²¹⁸ *Id.*

²¹⁹ *Id.* at 768.

²²⁰ *Id.* at 773.

²²¹ *Id.* at 775.

²²² *Chamberlain Group, Inc. v. Techtronic Industries Co.*, 935 F.3d 1341 (Fed. Cir. 2019).

²²³ *Id.* at 1345.

of wirelessly transmitting the status of the garage door.²²⁴ Hence, the claimed invention was for the abstract idea of “wirelessly communicating status information about a system.”²²⁵ Additionally, wirelessly transmitting data was well-known²²⁶ and could be accomplished with existing off-the-shelf technology used for its intended purpose.²²⁷ Consequently, the patented subject matter was patent ineligible.²²⁸

In re Morinville dealt with reorganization of the business structure of a business entity.²²⁹ When an entity is reorganized, such as due to a merger, access to business information may change for individuals in the enterprise.²³⁰ Typically, these changes are implemented manually.²³¹ The invention claims a method of doing this with a computer without claiming the use of any particular hardware or software.²³² The court concluded that merely computerizing this manual activity was an abstract idea under step one²³³ which was also devoid of any inventive concept under step two²³⁴ and therefore patent ineligible.²³⁵

In *Bascom Glob. Internet Servs. v. AT&T Mobility LLC*, the patent claimed a method of enabling an internet service provider to filter content accessible to its internet users.²³⁶ Each user was identified to the internet service provider, such as by logging in with an individual account, and an individualized filtering scheme was then applied to each specific user.²³⁷ The individualized schemes were maintained on the internet service provider’s computers.²³⁸ The Federal Circuit held that the invention was for the abstract

²²⁴ *Id.* at 1346.

²²⁵ *Id.*

²²⁶ *Id.* at 1348.

²²⁷ *Id.*

²²⁸ *Id.* at 1349.

²²⁹ *In re Morinville*, 767 F.App’x 964, 965 (Fed. Cir. 2019).

²³⁰ *Id.*

²³¹ *Id.* at 968.

²³² *Id.* at 966–67.

²³³ *Id.* at 969.

²³⁴ *Id.* at 970.

²³⁵ *Id.*

²³⁶ *Bascom Glob. Internet Servs. v. AT&T Mobility LLC*, 827 F.3d 1341, 1344–45 (Fed. Cir. 2016).

²³⁷ *Id.*

²³⁸ *Id.*

idea of filtering available content.²³⁹ However, it then concluded that an inventive concept existed that rendered the idea patent eligible subject matter.²⁴⁰ Although the court noted that each element in the claim was well-known in the art the inventive concept requirement was satisfied because the elements were arranged in a non-conventional and non-generic way.²⁴¹

Enfish, LLC v. Microsoft Corp. dealt with a novel arrangement of digital data that improves the operation of database software.²⁴² The claimed novel arrangement, according to the patent specification, improves search times, requires less memory and increases database flexibility when compared to conventional databases.²⁴³ The court concluded, contrary to the district court,²⁴⁴ that the claimed arrangement was not an abstract idea because it improved the operation of a computer with regard to the way data is stored and retrieved.²⁴⁵

In *Ancora Techs., Inc. v. HTC Am., Inc.*, the court, relying on *Enfish*, found a method of preventing a computer from running unauthorized software was patent eligible.²⁴⁶ Prior art software solutions for preventing a computer from running unauthorized software involved storing a license signature on the computer's hard drive.²⁴⁷ That signature was used to verify if the software was licensed to run on the computer. Such signatures, however, were susceptible to hacking.²⁴⁸ The new method at issue stored the license signatures on the modifiable memory of the computer's BIOS²⁴⁹ rather than on the hard drive.²⁵⁰ Hacking the BIOS memory is much harder than hacking information on the computer's hard drive so the new method improves the ability to restrict the use of unauthorized software.²⁵¹ The court

²³⁹ *Id.* at 1348.

²⁴⁰ *Id.* at 1352.

²⁴¹ *Id.* at 1350.

²⁴² *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1330–33 (Fed. Cir. 2016).

²⁴³ *Id.* at 1337.

²⁴⁴ *Id.* at 1330.

²⁴⁵ *Id.* at 1339.

²⁴⁶ *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1344 (Fed. Cir. 2018).

²⁴⁷ *Id.*

²⁴⁸ *Id.*

²⁴⁹ *Id.* at 1345 (“BIOS memory is typically used for storing programs that assist in the start-up of a computer . . .”).

²⁵⁰ *Id.*

²⁵¹ *Id.*

noted that the basic question was whether the software solution improved the functional operation of the computer and was therefore patent eligible.²⁵² Or, was the computer merely being used as a tool to carry out an abstract idea which would be patent ineligible.²⁵³ In this case, the functionality of a computer was improved by moving the license information from the computer's hard drive to its BIOS memory.²⁵⁴

In *SRI Int'l, Inc. v. Cisco Sys., Inc.*, the patents at issue provide a method of monitoring a computer network in order to detect real time security intrusions such as from hackers or malware.²⁵⁵ Specifically, monitors are placed throughout the network which examine various aspects of network traffic, analyze it and generate reports of suspicious activity based on that analysis.²⁵⁶ Both the district court²⁵⁷ and the Federal Circuit found the invention patent eligible because it dealt with the specific problem of network security of computer networks.²⁵⁸ This was in contrast to other cases which found software patents to be patent ineligible subject matter because they merely used a computer as a tool to computerize a conventional abstract idea.²⁵⁹

In *Cellspin Soft, Inc. v. Fitbit, Inc.*, the patentee obtained several patents that essentially cover the method of capturing digital data, such as pictures or video via a camera, and transferring the data via a Bluetooth connection to a smartphone which then automatically uploads the data to a website.²⁶⁰ The district court²⁶¹ and Federal Circuit both found the claims to be directed to an abstract idea under step one.²⁶² The district court dismissed the claims at the pleading stage on the basis of patent ineligibility after concluding that an

²⁵² *Id.* at 1347.

²⁵³ *Id.*

²⁵⁴ *Id.* at 1348–49.

²⁵⁵ *SRI Int'l, Inc. v. Cisco Sys., Inc.*, 918 F.3d 1368, 1373 (Fed. Cir. 2019), *on reh'g*, 930 F.3d 1295 (Fed. Cir. 2019), *cert. denied*, No. 19-619, 2020 WL 871719 (U.S. Feb. 24, 2020), and *reh'g granted, opinion withdrawn*, 773 F.App'x 620 (Fed. Cir. 2019).

²⁵⁶ *Id.*

²⁵⁷ *Id.* at 1375.

²⁵⁸ *Id.*

²⁵⁹ *Id.* at 1375–76.

²⁶⁰ *Cellspin Soft, Inc. v. Fitbit, Inc.*, 927 F.3d 1306, 1309–12 (Fed. Cir. 2019), *cert. denied sub nom.*, *Garmin USA, Inc. v. Cellspin Soft, Inc.*, No. 19-400, 2020 WL 129574 (U.S. Jan. 13, 2020).

²⁶¹ *Id.* at 1313.

²⁶² *Id.* at 1316.

inventive concept under step two did not exist.²⁶³ The Federal Circuit vacated the dismissal and remanded the case²⁶⁴ because the patentee had made factual allegations in its pleadings that aspects of its claimed method were unconventional.²⁶⁵ Additionally, it alleged that the various elements of the invention were arranged in an inventive combination.²⁶⁶ The Federal Circuit concluded that if the factual allegations were true, an inventive concept existed, so it remanded to enable the trial court to reach a determination on the accuracy of the factual allegations.²⁶⁷

Bridge & Post, Inc. v. Verizon Commc'ns, Inc., like *Cellspin Soft*, involved an appeal of the district court's dismissal on the pleadings.²⁶⁸ However, in *Bridge & Post* the court affirmed the dismissal on the basis of the patents at issue being directed to patent ineligible abstract ideas lacking an inventive concept.²⁶⁹ Several patents were issued for tracking a person's internet activity in order to send them targeted advertisements.²⁷⁰ The advertising methodology of using targeted advertisements predated the patents and was previously used by local radio and television stations.²⁷¹ Nevertheless, internet tracking allowed much more personalized information to be collected so targeted advertisements could be used more efficiently.²⁷² However, under step two, the patents at issue did not improve computer networking or the function of a computer.²⁷³ The patented method merely used a computer network to carry out an existing technique that predated computers.²⁷⁴ Additionally, it utilized a conventional arrangement of known computer techniques.²⁷⁵

In re Greenstein involved a patent application for saving money for retirement. The claim at issue provides for using a computer to determine an

²⁶³ *Id.* at 1313.

²⁶⁴ *Id.* at 1320.

²⁶⁵ *Id.* at 1317–18.

²⁶⁶ *Id.* at 1317.

²⁶⁷ *Id.* at 1320.

²⁶⁸ *Bridge & Post, Inc. v. Verizon Commc'ns, Inc.*, 778 F.App'x 882, 884 (Fed. Cir. 2019).

²⁶⁹ *Id.* at 894.

²⁷⁰ *Id.* at 884.

²⁷¹ *Id.*

²⁷² *Id.* at 887.

²⁷³ *Id.* at 889.

²⁷⁴ *Id.* at 891.

²⁷⁵ *Id.* at 892.

amount of money to save and invest in order to have a certain amount of income at a future date.²⁷⁶ The Federal Circuit found the claim to be directed to the abstract idea of adjusting the amount of money an individual saves and invests in order to save a sufficient amount for retirement.²⁷⁷ Additionally, the Federal Circuit held that the claim was patent ineligible because it merely claimed using a general purpose computer to carry out the abstract idea.²⁷⁸

C. Games

Rules for conducting a gambling game utilizing either cards or dice have been held to be patent ineligible subject matter. *In re Smith* involved rules for a card game which utilized standard cards that were shuffled and dealt via conventional methods.²⁷⁹ The court, under step one, noted that the rules standing alone were an abstract idea.²⁸⁰ Additionally, under step two, no inventive concept was present because the claimed steps involved the conventional steps of shuffling and dealing standard cards.²⁸¹ Hence, the only inventive aspect were the rules which standing alone were not patent eligible.

In *In re Marco Guldenaar Holding B.V.*, a claimed method of playing a wagering game with dice was deemed patent ineligible.²⁸² Relying on *In re Smith*, the court viewed rules for playing a wagering game with dice analogous to playing a similar game with cards.²⁸³ Therefore, the court found the rules for the dice game to likewise be an abstract idea.²⁸⁴ Additionally, the court held that rolling dice as part of a method of gambling was analogous to a wagering game involving cards.²⁸⁵ Again, the court appeared to focus on the fact that the only novel feature was the game rules. Arguably, these two cases suggest that new games generally will not be patent eligible if the games use conventional or preexisting materials and the only novel aspect are the game rules. In contrast, *In re Smith* expressly notes that if a game uses

²⁷⁶ *In re Greenstein*, 792 F.App'x 941, 942 (Fed. Cir. 2019).

²⁷⁷ *Id.*

²⁷⁸ *Id.* at 945.

²⁷⁹ *In re Smith*, 815 F.3d 816, 817–18 (Fed. Cir. 2016).

²⁸⁰ *Id.* at 818–19.

²⁸¹ *Id.* at 819.

²⁸² *In re Marco Guldenaar Holding B.V.*, 911 F.3d 1157, 1158–59 (Fed. Cir. 2018).

²⁸³ *Id.* at 1160–61.

²⁸⁴ *Id.*

²⁸⁵ *Id.* at 1161.

“a new or original deck of cards” it could be patent eligible.²⁸⁶ Nevertheless, the court in *In re Marco Guldenaar Holding B.V.* appears to ignore this distinction in light of the fact that the three dice required for the claimed game are six-sided non-conventional dice having different configurations of blank faces and marked faces.²⁸⁷

D. Miscellaneous

Claiming a mathematical concept was found to be an abstract idea that was patent ineligible subject matter in *In re Gitlin*.²⁸⁸ The court in this case rejected method claims for the mathematical operation of interpolation.²⁸⁹ This result is correct and consistent with Supreme Court precedent which has long recognized that mathematical equations are patent ineligible subject matter.²⁹⁰ Developing a mathematical equation or relationship may be the result of substantial time and effort. It may also be of great value. Nevertheless, such things are the type of fundamental knowledge that should be part of the public domain. Allowing private ownership, via a patent grant, could provide too much potential market power with regard to use of the mathematical relationship. This could ultimately impede innovation because third parties might have to pay licensing fees to use the relationship in a multitude of contexts.

In re Ebera involved a patent application claiming a new type of television network that was held ineligible for a patent.²⁹¹ Members of the public would be allowed to perform on a television show on the network in return for buying a particular product.²⁹² Under step one, the court viewed it as claiming a method of product promotion which it held was an abstract idea that was a basic economic activity.²⁹³ Additionally, there was no inventive concept under step two because all of the claim limitations were routine television production and advertising activities performed in a conventional

²⁸⁶ 815 F.3d at 819.

²⁸⁷ 911 F.3d at 1161. It should also be noted that the court provides the alternate explanation that the markings on the dice are printed matter which is not patent eligible subject matter. *Id.*

²⁸⁸ *In re Gitlin*, 775 F.App'x 689, 691 (Fed. Cir. 2019).

²⁸⁹ *Id.* at 692.

²⁹⁰ *See, e.g.*, *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

²⁹¹ *In re Ebera*, 730 F.App'x 916, 918 (Fed. Cir. 2018).

²⁹² *Id.* at 917.

²⁹³ *Id.* at 917–18.

manner.²⁹⁴ Hence, the applicant was attempting to claim an idea rather than an embodiment of an idea. And, ideas per se are not patent eligible subject matter.²⁹⁵

In re Brown disclosed a method of cutting hair that is designed to provide consistent and repeatable haircuts.²⁹⁶ The method involves identifying the customer as having one of three possible head shapes based on two measurements.²⁹⁷ The head is then divided into three different zones and a conventional hair pattern to be used in each zone is identified.²⁹⁸ The court found identifying head shape and determining which hair pattern to use was an abstract idea.²⁹⁹ The conventional method of cutting hair with a scissors was not an inventive concept.³⁰⁰ This is a difficult case because arguably the invention is more than merely an idea in light of the various concrete steps required to carry out the claimed method. Therefore, it could be argued the invention is patent eligible subject matter.

Exergen Corp. v. Kaz USA, Inc. involved a noninvasive way to determine human body temperature.³⁰¹ The patents include both product and method claims that require measuring ambient air temperature and forehead temperature at a location adjacent to an artery and then electronically calculating human body temperature based on those measurements.³⁰² Both the majority and dissent agreed that a natural law was involved under step one, so the focus was on the step two analysis.³⁰³ Under step two, the question is whether a sufficient inventive concept exists to transform the claimed invention into a patent eligible invention.³⁰⁴ The district court concluded that the necessary inventive concept existed in light of the existing prior art.³⁰⁵ The Federal Circuit treated this conclusion as a factual question, so it

²⁹⁴ *Id.* at 918.

²⁹⁵ *Id.* at 917.

²⁹⁶ *In re Brown*, 645 F.App'x 1014–16 (Fed. Cir. 2016).

²⁹⁷ *Id.* at 1015.

²⁹⁸ *Id.*

²⁹⁹ *Id.* at 1016.

³⁰⁰ *Id.* at 1017.

³⁰¹ *Exergen Corp. v. Kaz USA, Inc.*, 725 F.App'x 959, 961–62 (Fed. Cir. 2018).

³⁰² *Id.* at 962, 964.

³⁰³ *Id.* at 964, 973 (Hughes, J., dissenting).

³⁰⁴ *Id.* at 964.

³⁰⁵ *Id.*

affirmed this conclusion in light of the broad deference an appellate court gives to trial court factual determinations.³⁰⁶

In *Reese v. Sprint Nextel Corp.*, the claimed invention applies to a telephone user who is subscribed to both call waiting and caller ID.³⁰⁷ Normally, a private number would be blocked by caller ID. The patentee claims the method of sending an audible call waiting signal to a telephone user engaged in a telephone conversation when a third party is attempting to reach the user via a private number even though the telephone user is subscribed to caller ID.³⁰⁸ The claim does not require the use of new equipment or a novel arrangement of existing equipment.³⁰⁹ The only limitation appears to be that the method is applicable to a telephone system.³¹⁰ Consequently, the court found the claim was for a patent ineligible abstract idea under step one.³¹¹ Likewise, the court did not find the existence of an inventive concept under step two because the patent solely utilizes conventional prior art telephone equipment.³¹²

The above Federal Circuit cases yield some general conclusions. First, patents for diagnostic tests may be difficult to obtain in light of current patent eligibility jurisprudence. Such patents often use conventional technology with the only novel aspect being identification of a new naturally occurring phenomena such as finding a new substance in bodily fluids or a new gene defect. These novel discoveries may be both valuable and of great importance for medical diagnosticians, but they typically represent basic or fundamental scientific findings that belong in the public domain. In contrast, if the novel findings can be claimed as a method of treating a particular disease or medical condition patent, eligibility is likely to be found. In the realm of computer technology merely computerizing tasks or techniques by itself is not patent eligible subject matter. However, if the invention actually improves how a computer operates, such as a novel way of more rapidly accessing stored data, it is likely to be a patent eligible invention. Finally, a common characteristic of many of the patents and patent applications found to be directed to patent ineligible subject matter was over-claiming. In most cases, the claims at issue

³⁰⁶ *Id.* at 965.

³⁰⁷ *Reese v. Sprint Nextel Corp.*, 774 F.App'x 656, 658 (Fed. Cir. 2019).

³⁰⁸ *Id.* at 660.

³⁰⁹ *Id.* at 661.

³¹⁰ *Id.* at 660.

³¹¹ *Id.*

³¹² *Id.* at 661.

attempted to claim far more than the actual invention. This is not a new issue.³¹³ Additionally, it is often driven by legitimate economic and business interests. Narrow claims can often be easily circumvented by competitors who can freeride on the work of an inventor. Hence, patent attorneys attempt to draft broad claims to avoid this. However, such broad claims often have the effect of attempting to create property rights in technological information or knowledge that more appropriately belongs in the public domain. It is often, therefore, appropriate that such claims are held to be patent ineligible.

CONCLUSION

The continuing litigation over what is patent eligible subject matter reflects the tension between the law's desire to maintain a public domain of knowledge and the desire of individuals and companies to obtain patent protection over all new forms of discovery and innovation. Preserving a public domain of knowledge helps to promote innovation by denying private ownership of fundamental ideas and knowledge which are necessary tools that must be freely available to all to enhance innovative endeavors. Additionally, such litigation allows the body of precedents to grow as judges continue to struggle with this difficult legal issue. The existing body of case law suggests that recent judicial decisions are generally correctly drawing the line between technology that belongs in the public domain and technology that is eligible for private property protection by granting a patent. Development of this area of law one judicial opinion at a time can be unsettling to those who desire instant and perfect resolution of a legal issue. However, drawing the line in this area is never likely to be clear cut nor easy. Nevertheless, the slow evolution of the case law will slowly make the line easier to draw. Plus, the expanding number of precedents will make it easier to predict the result in a particular case by analogizing to previous judicial decisions. It will also allow for judicial refinement of the law to occur until a general judicial consensus develops that provides the most generally predictable results that are possible in this complex area of law.

³¹³ See, e.g., *Holstenson v. V-M Corp.*, 325 F.2d 109, 126 (6th Cir. 1963).