

Make It Make Sense: How Congress Can (and Should) Clarify Patent-Eligible Subject Matter

ABSTRACT

The eligibility of inventions for patent protection under 35 U.S.C. Section 101 was altered substantially by the Supreme Court’s decisions in Alice v. CLS Bank and Mayo v. Prometheus. These decisions and their progeny have expanded application of the implicit “judicial exceptions” to patent eligibility for laws of nature, natural phenomena, and abstract ideas. The resulting uncertainty has proven untenable for many stakeholders in the patent system, impeding innovation. With the Supreme Court steadfastly declining to provide clarity by granting certiorari in recent cases raising Section 101 questions, many are calling for Congress to act.

While policy debate around Section 101 reform is alive and well, much of the scholarship on the issue focuses on the principles that ought to guide reform. This Note seeks to further the conversation by comparing justifications for subject matter restrictions against specific statutory language. Using the Patent Eligibility Restoration Act of 2023 (PERA) as a case study, this Note compares PERA with the theory and recommendations provided by patent law scholars and finds it is strikingly consistent with utilitarian and other normative justifications for subject matter restrictions. This reformulation of Section 101 may alleviate much of the uncertainty harmful to stakeholders in the patent system. Recognizing imperfections in PERA, this Note concludes by proposing two amendments that would provide greater clarity and restrict eligibility for patents that are unlikely to provide societal value.

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If asked what constitutes an abstract idea, one may imagine intangible notions such as “freedom” or “beauty.” For patent law practitioners, however, the mind may instead jump to concepts such as “playing bingo,” “testing operators of any kind of moving equipment for any kind of physical or mental impairment,” or “anonymous loan shopping.”¹ Such is life in the wonderland of *Alice* (and *Mayo*).²

Despite the breathtaking growth of humanity’s technological competence since 1793, subject matter eligibility for patent protection has undergone virtually no textual change.³ Yet, for all this textual constancy, interpretation has been fickle. The application of judicial exceptions to eligible subject matter—including abstract ideas—has

1. Planet Bingo, LLC v. VKGS, LLC, 961 F. Supp. 2d 840, 851 (W.D. Mich. 2013) (“Plainly, each method claim encompasses the abstract idea of managing/playing the game of Bingo.”), *aff’d*, 576 F. App’x 1005 (Fed. Cir. 2014); Vehicle Intel. & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App’x 914, 917 (Fed. Cir. 2015); Mortg. Grader, Inc. v. First Choice Loan Servs. Inc., 811 F.3d 1314, 1324 (Fed. Cir. 2016).

2. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 212 (2014); *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 71 (2012).

3. *Compare* Patent Act of 1793, ch. 11, § 1, 1 Stat. 318, 319 (repealed 1836) (allowing patents on “any new and useful art, machine, manufacture, or composition of matter”), *with* 35 U.S.C. § 101 (allowing patents on “any new and useful process, machine, manufacture, or composition of matter”). Congress’s decision to replace “art” with “process” in the 1952 Patent Act was not intended to be a substantive change. *See* David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 213 (2016) [hereinafter Taylor, *Confusing Patent Eligibility*].

expanded, contracted, and expanded again.⁴ In the years preceding the US Supreme Court’s most recent foray into Section 101,⁵ eligible subject matter doctrine was relatively limited in application,⁶ with Section 101 often—though far from exclusively—viewed as a mere “coarse filter” to patentability.⁷

Today, the eligible subject matter inquiry is governed by the *Alice/Mayo* test, which proceeds in two steps.⁸ First, courts ask whether the patent claims are “directed to” a law of nature, natural phenomenon, or abstract idea.⁹ If not, the claim is patent eligible.¹⁰ If it is “directed to” one of these categories, however, step two requires an “inventive concept” to differentiate the claim from the law of nature, natural phenomenon, or abstract idea at issue.¹¹ Both steps, at least in their current form, are imbued with uncertainty.¹²

4. See *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 131 (1948) (holding that a combination of nitrogen-fixating bacteria was “no more than the discovery of some of the handiwork of nature and hence is not patentable”); *Diamond v. Diehr*, 450 U.S. 175, 192–93 (1981); *Alice*, 573 U.S. at 212.

5. The Supreme Court heard four cases in five terms deciding Section 101 questions, resulting in the so-called *Alice/Mayo* test. See *Mayo*, 566 U.S. at 73; *Alice*, 573 U.S. at 217; *Bilski v. Kappos*, 561 U.S. 593, 601–04 (2010); *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589–90 (2013).

6. An era of limited application of eligible subject matter doctrine may be illustrated by the Supreme Court’s decisions in the early 1980’s. *Diamond v. Chakrabarty*, 447 U.S. 303, 321–22 (1980); *Diehr*, 450 U.S. at 187; see David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 214–16 (2009) (interpreting these decisions as the Supreme Court’s “abandonment of a subject matter gatekeeping role”); *infra* Section I.A.1. This Note uses the term “eligible subject matter” rather than “patentable subject matter” to minimize confusion. See Taylor, *Confusing Patent Eligibility*, *supra* note 3, at 186–87 (outlining reasons to prefer the phrase “eligible subject matter”).

7. See, e.g., Timothy R. Holbrook & Mark D. Janis, *Patent-Eligible Processes: An Audience Perspective*, 17 VAND. J. ENT. & TECH. L. 349, 351–53 (2015). In the decade prior to *Bilski*, eligible subject matter doctrine was “a dead letter.” Mark A. Lemley, Michael Risch, Ted Sichelman & R. Polk Wagner, *Life After Bilski*, 63 STAN. L. REV. 1315, 1318 (2011).

8. Philip Hawkyard, *The Collapse of Alice’s Wonderland: Mayo’s Faulty Two-Step Framework and A Possible Solution to Patent-Eligibility Jurisprudence*, 74 HASTINGS L.J. 1221, 1226 (2023).

9. *Alice*, 573 U.S. at 217.

10. *Id.*

11. *Id.* at 219.

12. See, e.g., Craig Allen Nard, *Patent Law’s Purposeful Ambiguity*, 87 TENN. L. REV. 187, 189–90, 192 (2019) (deeming the terms ‘abstract idea’ and ‘inventive concept’ “hopelessly ambiguous” and “part of the ‘murky morass’ that is subject matter eligibility jurisprudence”). The “inventive concept” inquiry has also been compared to the Supreme Court’s historical, much-maligned “invention” requirement. See *id.*; David O. Taylor, *Patent Reform, Then and Now*, 2019 MICH. ST. L. REV. 431, 498 (2019) [hereinafter Taylor, *Patent Reform, Then and Now*] (drawing parallels between the “invention” requirement leading to the 1952 Patent Act and the “inventive concept” requirement leading to potential modern reform).

This uncertainty has been decried by federal judges and academics, alongside far gentler critiques from the Solicitor General.¹³ Perhaps the most compelling criticism, however, comes from Judge Paul Michel, former Chief Judge of the US Court of Appeals for the Federal Circuit.¹⁴ At a 2019 Senate Subcommittee hearing on amending Section 101, his written testimony provided in part:

[R]ecent cases are unclear, inconsistent with one another and confusing. I myself cannot reconcile the cases. . . . If I, as a judge with 22 years of experience deciding patent cases on the Federal Circuit’s bench, cannot predict outcomes based on case law, how can we expect patent examiners, trial judges, inventors and investors to do so?¹⁵

With such a bleak outlook from an expert jurist, the appetite for reform should come as no surprise. In June 2023, the bipartisan duo of Senators Coons and Tillis introduced the Patent Eligibility Restoration Act of 2023 (PERA) to effectuate such reform; if enacted, the law would eliminate the judicial exceptions and wholly rewrite Section 101.¹⁶ While Senators Coons and Tillis have a history of largely unsuccessful patent reform thus far, they have diligently held substantive hearings and continued to refine their proposal—signaling that the desire for reform continues to manifest among lawmakers and experts.¹⁷

Using PERA as a case study, this Note seeks to concretize the debate around Section 101 reform by assessing its specific statutory language, comparing it against the recommendations of other commentators and scholars, and providing further recommendations

13. See *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1348 (Fed. Cir. 2018) (Plager, J., concurring in part and dissenting in part) (“The law . . . renders it near impossible to know with any certainty whether the invention is or is not patent eligible [under Section 101].”); *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 977 F.3d 1379, 1382 (Fed. Cir. 2020) (Moore, J., concurring) (“As the nation’s lone patent court, we are at a loss as to how to uniformly apply section 101.”); Jason D. Reinecke, *Is the Supreme Court’s Patentable Subject Matter Test Overly Ambiguous? An Empirical Test*, 2019 UTAH L. REV. 581, 582 (“Scholars have described the test as, among other things, ‘a foggy standard cloaked as a rule,’ ‘too philosophical and policy based to be administrable,’ a ‘crisis of confusion,’ ‘rife with indeterminacy,’ and one that ‘forces lower courts to engage in mental gymnastics.’”); Brief for the United States as Amicus Curiae at 10, *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 142 S. Ct. 2902 (2022) (No. 20-891) (“The *Mayo/Alice* framework has given rise to substantial uncertainty.”).

14. *The State of Patent Eligibility in America: Part I Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 116th Cong. (2019) (testimony of Paul R. Michel, Judge, Fed. Cir.), <https://www.judiciary.senate.gov/imo/media/doc/Michel%20Testimony.pdf> [<https://perma.cc/V5PG-QZBV>] (last visited Oct. 5, 2023).

15. *Id.*

16. See Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. (2023).

17. See *The State of Patent Eligibility in America: Parts I-III Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 116th Cong. (2019); *The Patent Eligibility Restoration Act – Restoring Clarity, Certainty, and Predictability to the U.S. Patent System Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 118th Cong. (2024).

for improvement and implementation. Part I of this Note provides background on eligible subject matter jurisprudence, the *Alice/Mayo* test, and the effects of the resulting uncertainty. Finding eligible subject matter reform justified, Part II then briefly analyzes avenues to effect change, concludes that Congress must provide clarity to Section 101, and outlines the substance of PERA in its current state. This Note then compares PERA against different theories and justifications for subject matter eligibility, noting its merits and demerits in Part III. Finally, after taking account of PERA's shortcomings, Part IV suggests two amendments that would ultimately improve the proposal by providing greater clarity around disregarding claim elements, as well as restricting eligibility for patents that are unlikely to provide societal value.

I. ELIGIBLE SUBJECT MATTER DOCTRINE

The patent system is often conceptualized as predicated on a *quid pro quo*.¹⁸ In exchange for public disclosure of certain inventions, the federal government provides a limited monopoly over the claimed invention in the form of a patent right.¹⁹ To receive a patent, applicants must show, among other things, (1) eligible subject matter, (2) utility, (3) novelty, (4) nonobviousness, and (5) adequate disclosure.²⁰ Thus, the debate over eligible subject matter does not necessarily determine what is ultimately patentable; it is only one inquiry among many.²¹

Section 101 provides four categories of eligible subject matter: processes, machines, manufactures, and compositions of matter.²² The Supreme Court, however, has long recognized implicit exceptions to these categories derived from English common law.²³ Although the particular formulation of these exceptions has varied over time, the

18. See *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 63 (1998) (“[T]he patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for a limited period of time.”).

19. *Id.*

20. See 35 U.S.C. §§ 101 (eligible subject matter and utility), 102 (novelty), 103 (nonobviousness), 112 (disclosure and claiming requirements).

21. See Taylor, *Confusing Patent Eligibility*, *supra* note 3, at 217–18 (discussing the relationship between Section 101 and other patentability requirements); Michael Risch, *Everything Is Patentable*, 75 TENN. L. REV. 591, 598 (2008) (advocating for more rigorous application of other patentability requirements and reducing reliance on Section 101).

22. 35 U.S.C. § 101.

23. H. Jared Doster, *The English Origins of the Judicial Exceptions to 35 U.S.C. § 101*, 11 LANDSLIDE 23, 23 (2019) (“The Supreme Court imported the judicial exceptions entirely from English common law.”). Despite our shared language and legal history, there is reason to believe that something was lost in translation when this doctrine came to the United States. See Jeffrey A. Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565, 645 (2015).

Supreme Court’s modern rendition of excepted material deems “laws of nature, natural phenomena, and abstract ideas” unpatentable, for fear that their “monopolization . . . might tend to impede innovation”²⁴ The fundamental tension between the patentable and unpatentable under Section 101 is evident, “[f]or all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena or abstract ideas.”²⁵

A. Section 101 and Methods of Interpretation

The history and development of the judicial exceptions to Section 101 are long and convoluted,²⁶ but an accurate—albeit simplistic—understanding of the two opposing perspectives of eligible subject matter can be understood by contrasting *Alice* and *Mayo* with another pair of cases: *Diamond v. Chakrabarty* and *Diamond v. Diehr*.²⁷

1. The 1980’s: Section 101 as a “Coarse Filter”

In *Chakrabarty*, the Court had occasion to consider the patent eligibility of a “human-made, genetically engineered bacterium” under Section 101.²⁸ The Court—en route to finding the invention eligible—took a clearly textual tack, noting the statute’s “expansive terms” and warning “that courts ‘should not read into the patent laws limitations and conditions which the legislature had not expressed.’”²⁹ The Court found further support for a broad construction in congressional reports interpreting eligible subject matter to “include anything under the sun that is made by man.”³⁰ In holding the bio-engineered bacterium

24. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 71 (2012).

25. *Id.*

26. *See generally* Joshua D. Sarnoff, *Patent-Eligible Inventions After Bilski: History and Theory*, 63 HASTINGS L.J. 53, 61 (2011) (outlining history of and justifications for implicit subject matter restrictions); Lefstin, *supra* note 23, at 577–645 (tracing eligible subject matter doctrine from its roots in English common law to the Supreme Court).

27. *Diamond v. Chakrabarty*, 447 U.S. 303, 307–10 (1980); *Diamond v. Diehr*, 450 U.S. 175, 191–93 (1981).

28. 447 U.S. at 305.

29. *Id.* at 308 (quoting *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933)). The irony of this oft-quoted admonition in light of the *Alice/Mayo* expansion of judicial exceptions is not lost on the Author, nor on patent law scholars. *See, e.g.*, Sam F. Halabi, *Constitutional Avoidance and the Federal Common Law of Patent Subject Matter Eligibility*, 22 NEV. L.J. 211, 275 (2021).

30. *Chakrabarty*, 447 U.S. at 309 (first quoting S. REP. NO. 82-1979, at 5 (1952); and then quoting H.R. REP. NO. 82-1923, at 6 (1952)). *But see* Paul R. Gugliuzza & Mark A. Lemley, *Can A Court Change the Law by Saying Nothing?*, 71 VAND. L. REV. 765, 770 (2018) (arguing this phrase was “selectively quoted” and missing context).

patentable, the *Chakrabarty* Court stated it “perceive[d] no ambiguity,” as the bacterium was surely a “manufacture” or “composition of matter” under Section 101.³¹ The Court noted, however, that Section 101 is not all-encompassing, as prior cases had established the existence of narrow judicial exceptions.³²

The following term, in *Diamond v. Diehr*, the Court reaffirmed its broad interpretation of Section 101 and narrow interpretation of the judicial exceptions.³³ In *Diehr*, the Court considered a process for curing rubber with the aid of a computer and a well-known equation.³⁴ While the claims at issue were indisputably “process[es],” their reliance on the equation governing cure times arguably implicated the “law of nature” exception.³⁵ Holding the claims patentable, the Court clarified the scope of the judicial exceptions, noting processes are “not unpatentable simply because [they] contain a law of nature or . . . algorithm.”³⁶ Importantly, because the claims included other steps—“installing rubber in a press, closing the mold, constantly determining the temperature of the mold, [applying the equation], and automatically opening the press”—they would not “pre-empt the use of [the] equation.”³⁷ The Court also took care to distinguish its Section 101 ruling from a finding that the process fulfilled other patentability requirements.³⁸

Thus, while ostensibly upholding precedent and the existence of the judicial exceptions, *Diehr* represented the continued ascendancy of the “coarse filter” philosophy, which views the eligible subject matter

31. *Chakrabarty*, 447 U.S. at 309, 315.

32. *Id.* To illustrate its point, the Court pointed to naturally occurring plants and minerals, Albert Einstein’s theory of special relativity, and Isaac Newton’s law of gravity as examples of ineligible subject matter. *Id.* at 309.

33. 450 U.S. 175 (1981); see Sarnoff, *supra* note 26, at 58–59 (terming *Diehr* the Supreme Court’s “most claimant-friendly” eligible subject matter case).

34. This was the Arrhenius equation, the application of which yielded cure times for the rubber based on temperature. *Diehr*, 450 U.S. at 177–78.

35. *Id.* at 185–87 (majority opinion), 213–15 (Stevens, J., dissenting).

36. *Id.* at 187 (majority opinion) (quoting *Parker v. Flook*, 437 U.S. 584, 590 (1978)) (internal quotation marks omitted).

37. *Diehr*, 450 U.S. at 177, 187. While these steps may seem routine, insignificant, or necessary to use the invention, *Diehr* did not state as much. See *id.* at 187. A future Court would take note of this omission. See *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 81–82 (2012).

38. *Diehr*, 450 U.S. at 190–91. But see *id.* at 211, n.33 (Stevens, J., dissenting) (“As I understand the record . . . [the §§ 102, 103] issues have already been resolved. . . . Therefore, the Court is now deciding that the patent will issue.”).

inquiry as only applicable in “rare and extreme cases,” leaving other patentability requirements to operate as finer filters.³⁹

2. The 2010’s: Section 101 as “Gatekeeper”

After decades of quiescence from the Supreme Court, the “coarse filter” era left as quickly as it came.⁴⁰ In a series of unanimous opinions, even textualist justices agreed the Court had the duty to apply implicit exceptions to prevent patents on “basic tools of scientific and technological work,” as such patents “might tend to impede innovation more than . . . promote it.”⁴¹

In perhaps the Court’s most significant step toward reinvigorating the Section 101 inquiry, *Mayo v. Prometheus*, the contested claims were processes for determining proper drug dosages by measuring the concentration of certain metabolites in the blood.⁴² The Court deemed the correlation between dosage and metabolite concentrations a law of nature, and the additional steps—administering a dose, measuring metabolites, and adjusting the dosage accordingly—failed to “add *enough*” to make the claim patent eligible.⁴³ Because doctors routinely performed these other steps individually, and their use as an ordered combination was effectively required to apply the natural law describing the relationship between dosage and metabolite

39. Holbrook & Janis, *supra* note 7, at 352; see Olson, *supra* note 6, at 216. In *Diehr*, the Court purported to uphold a very similar case which found the contested claims ineligible. See 450 U.S. at 186–87 (citing *Parker v. Flook*, 437 U.S. 584 (1978)).

40. David O. Taylor, *Patent Eligibility and Investment*, 41 CARDOZO L. REV. 2019, 2032 (2020) [hereinafter Taylor, *Patent Eligibility and Investment*] (noting the Supreme Court did not decide any eligible subject matter cases between 1982 and 2010). The Court did, however, grant and later dismiss certiorari in one Section 101 case. See *Lab’y Corp. of Am. Holdings v. Metabolite Lab’ys, Inc.*, 548 U.S. 124, 125–26 (2006) (Breyer, J., dissenting from dismissal of the writ of certiorari as improvidently granted).

41. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (first quoting *Mayo*, 566 U.S. at 86; and then quoting *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)) (internal quotation marks omitted). The Court decided three of their four eligible subject matter cases from the 2010’s unanimously. *Mayo*, 566 U.S. 66; *Myriad*, 569 U.S. 576; *Alice*, 573 U.S. 208. Both *Alice* and *Myriad* were authored by Justice Thomas, a surprising proponent of implicit substantive law, given his endorsement of textualism. See John F. Manning, *Second-Generation Textualism*, 98 CAL. L. REV. 1287, 1311 (2010) (deeming Justice Thomas one of “[t]he Court’s most committed textualists”); see also David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149, 2193 (2017) (“The Court does not attempt to tie the exceptions to . . . text. Even the conservative Supreme Court Justices . . . resort to, or at least comply with, bald policymaking at worst, and loose interpretations . . . at best.”); cf. *Johnson v. United States*, 576 U.S. 591, 607–08 (2015) (Thomas, J., concurring) (advocating for elimination of substantive due process because it is “a judicially created doctrine lacking any basis in the Constitution”).

42. *Mayo*, 566 U.S. at 72.

43. *Id.* at 77–80.

concentrations, they failed to add “significantly more.”⁴⁴ While *Mayo* squarely impacted medical diagnostics, it left the eligible subject matter standard for other patents arguably underdeveloped.⁴⁵

The Court responded to this concern in *Alice* by clarifying the two-step test and declaring its applicability to all judicial exceptions.⁴⁶ There, the contested patents disclosed methods for risk mitigation; for a given transaction, a computer intermediary would be used to ensure each party had sufficient resources to meet its obligation.⁴⁷ The Court wasted no time in identifying the claims as “drawn to the abstract idea of intermediated settlement,” a longstanding practice and “building block of the modern economy.”⁴⁸ At step two, it concluded the “generic computer implementation” required by the claim failed to establish an “inventive concept.”⁴⁹

After *Alice*, Section 101 was firmly entrenched as “gatekeeper,” carrying substantial exclusionary force to “weed[] out ill-advised and unwarranted patents” without yielding to other patentability requirements.⁵⁰ Unfortunately, given the atextual nature of these exclusions and the limited clarity provided by the Supreme Court, Section 101’s role as gatekeeper has produced considerable confusion, uncertainty, and consternation.⁵¹

44. *Id.*

45. See *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 927 F.3d 1333, 1352–55 (Fed. Cir. 2019) (Moore, J., dissenting) (interpreting the Federal Circuit’s application of *Mayo* as establishing a per se rule against patenting medical diagnostics); Bernard Chao, *Finding the Point of Novelty in Software Patents*, 28 BERKELEY TECH. L.J. 1217, 1247 (2013) (analyzing and applying *Mayo* to software and business method patents prior to the Court’s decision in *Alice*).

46. *Alice*, 573 U.S. at 217–18. Some confusion may remain as to the applicability of the *Alice/Mayo* framework to DNA patents. See Petition for Writ of Certiorari, *Chromadex, Inc. v. Elysium Health, Inc.*, 2023 WL 6064274, at *1–2 (No. 23-245) (alleging an intra-circuit split on this question in the Federal Circuit). The Supreme Court declined to hear *Chromadex*. No. 23-245, 2023 WL 6797747, at *1 (U.S. Oct. 16, 2023).

47. *Alice*, 573 U.S. at 212–14.

48. *Id.* at 218–20.

49. *Id.* at 221.

50. See Christopher M. Holman, *Patent Eligibility Post-Myriad: A Reinvigorated Judicial Wildcard of Uncertain Effect*, 82 GEO. WASH. L. REV. 1796, 1798 (2014).

51. See, e.g., *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1348 (Fed. Cir. 2018) (Plager, J., concurring in part and dissenting in part) (“The law . . . renders it near impossible to know with any certainty whether the invention is or is not patent eligible [under Section 101].”); Brief for the United States as Amicus Curiae at 10, *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 142 S. Ct. 2902 (2022) (No. 20-891) (“The *Mayo/Alice* framework has given rise to substantial uncertainty.”).

B. The Effects of Uncertainty in Eligible Subject Matter

The gatekeeper era ushered in by *Alice* and *Mayo* resulted in a wave of invalidations and muddled Federal Circuit case law, in addition to “increasing . . . transaction costs . . . and creating uncertain outcomes in patent allowance.”⁵² One might presume this uncertainty justifies reform as a concomitant, but within legal systems generally, and the innovation economy specifically, not all uncertainty is harmful.⁵³ In the patent context, harmful uncertainty is that which hampers innovation or, in other terms, fails “to promote the Progress of Science and useful Arts”⁵⁴ Because innovation largely drives modern economic growth, the effect of uncertainty can be measured by assessing its impact on investment.⁵⁵

Using this investment-impact model, patent law scholar Daniel Cahoy draws on behavioral economics to identify the effects of uncertainty from three patent law doctrines: eligible subject matter, obviousness, and fee shifting.⁵⁶ Cahoy’s review of behavioral economics identifies two primary factors that determine whether a particular form of uncertainty is likely to be harmful: competency and ex post

52. Jay P. Kesan & Runhua Wang, *Eligible Subject Matter at the Patent Office: An Empirical Study of the Influence of Alice on Patent Examiners and Patent Applicants*, 105 MINN. L. REV. 527, 604 (2020); see Jasper L. Tran, *Alice at Seven*, 101 J. PAT. & TRADEMARK OFF. SOC’Y 454, 529 (2021) (providing updated statistics and concluding that invalidations are beginning to regress to the mean, though uncertainty remains). To accept the uncertainty in litigation of eligible subject matter, one need not look beyond the fracturing of the Federal Circuit in two of its denials of rehearing en banc. See *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 966 F.3d 1347 (Fed. Cir. 2020); *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 927 F.3d 1333 (Fed. Cir. 2019). The two decisions—decided on 6-6 and 7-5 votes, respectively—collectively produced more than a dozen opinions with widely divergent perspectives. See *Am. Axle*, 966 F.3d 1347; *Athena Diagnostics*, 927 F.3d 1333.

53. For example, a flexible standard for fee-shifting in patent litigation increases uncertainty to litigants but also provides a deterrent to bringing frivolous patent infringement lawsuits. See Daniel R. Cahoy, *Patently Uncertain*, 17 NW. J. TECH. & INTELL. PROP. 1, 43–47 (2019); see also Kelly Casey Mullally, *Legal (Un)certainty, Legal Process, and Patent Law*, 43 LOY. L.A. L. REV. 1109, 1110 (2010) (“This Article . . . presents a critique of the demand for certainty in patent law and advocates a more measured debate over indeterminacy in the patent system.”).

54. U.S. CONST. art. I, § 8, cl. 8; see Cahoy, *supra* note 53, at 17–23 (analyzing how uncertainty can reduce innovation incentives through behavioral economics).

55. See Cahoy, *supra* note 53, at 7–8; A. Sasha Hoyt, *The Impact of Uncertainty Regarding Patent Eligible Subject Matter for Investment in U.S. Medical Diagnostic Technologies*, 79 WASH. & LEE L. REV. 397 (analyzing reduced investment in medical diagnostics); see also Taylor, *Patent Eligibility and Investment*, *supra* note 40, at 2023 (“The most significant concern with the Supreme Court’s new eligibility standard is that it has negatively impacted investment . . .”).

56. While uncertainty, risk, and ambiguity can be terms of art in different areas of behavioral economics and law, this paper follows Daniel Cahoy’s approach and uses “uncertainty” to mean “non-ascertainable probabilit[ies].” Cahoy, *supra* note 53, at 16–17.

investment impacts.⁵⁷ Applying these criteria to the uncertainty of Section 101, Cahoy finds reform justified as “the current state of patentable subject matter is an issue on which innovators have little to *no competence*, yet the future determination will certain[ly] *impact investment* in the future.”⁵⁸ Cahoy’s theoretical explication of Section 101’s harmful uncertainty is further supported by empirical studies.⁵⁹ One such study attributed more than \$9 billion in lost research and development investment solely in the medical diagnostics industry to *Mayo* and its impact.⁶⁰ Thus, because the uncertainty introduced by the Court’s decisions in *Alice* and *Mayo* is likely to be harmful, altering eligible subject matter doctrine is justified.⁶¹

II. COURTS, CONGRESS, AND THE SEARCH FOR SOLUTIONS

Reforming eligible subject matter requires a choice of institutional actor, and while the Supreme Court could choose to provide clarity, it has steadfastly refused to grant certiorari in cases raising eligible subject matter questions.⁶² Beyond the apparent lack of interest, the Court is constrained by its precedent and limited constitutional authority, as it is vested with only judicial—not legislative—power.⁶³ Thus, while the Court could provide some measure of interpretive clarity, its authority to wholly rewrite patent statutes is limited both textually and doctrinally.⁶⁴ Likewise, as a purely executive administrative agency, the US Patent and Trademark Office (USPTO)

57. Cahoy, *supra* note 53, at 22.

58. *Id.* at 40.

59. See Taylor, *Patent Eligibility and Investment*, *supra* note 40, at 2070 (observing reduced technological investment from a survey of 475 venture capital and private equity investors after *Alice*); Hoyt, *supra* note 55, at 445–46 (observing a \$9.3 billion loss in medical diagnostic investment over four years that was attributable to *Mayo*). There has, however, been evidence of increased investment in developing business methods after *Alice*. See Sridhar Srinivasan, *Do Weaker Patents Induce Greater Research Investments?* (Dec. 22, 2018) (Ph.D. dissertation, Northwestern University) (on file with author). This finding does not undermine the argument that *Alice* has harmed investment; in fact, it is consistent with the conclusion that business methods generally do not warrant patent protection. See, e.g., Olson, *supra* note 6, at 228–32.

60. Hoyt, *supra* note 55, at 445–46.

61. See Kesan & Wang, *supra* note 52, at 530.

62. *Id.* at 528, n.4 (listing denials of certiorari). The trend of denying cert has continued in the Supreme Court’s 2023–24 term. See *Caredx Inc. v. Natera, Inc.*, No. 22-1066, 2023 WL 6379010 (U.S. Oct. 2, 2023); *Chromadex, Inc. v. Elysium Health, Inc.*, No. 23-245, 2023 WL 6797747 (U.S. Oct. 16, 2023).

63. See U.S. CONST. arts. I–III.

64. See *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980) (quoting *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933)) (“[C]ourts should not read into the patent laws limitations and conditions which the legislature had not expressed.”).

could not make such a change absent a valid delegation of authority from Congress.⁶⁵

Congress itself, however, is not so limited. It has substantially greater fact-finding ability than courts, and its authority on the subject of patents is plenary.⁶⁶ In fact, Congress has previously exercised this authority to rein in a judiciary that was perceived as overly hostile to patentees.⁶⁷ Faced with the contemporary Court's priorities, which some commentators see as similarly hostile, Congress has recently taken steps toward reform.⁶⁸ Despite concerns over Congress's ability to legislate effectively,⁶⁹ the most recent and promising legislation, the Patent Eligibility Restoration Act of 2023 (PERA), provides a proposal that would wrest control over eligible subject matter away from the arcane realm of judicial exceptions and replace it with considerably less ambiguous statutory exclusions.⁷⁰

A. *The Patent Eligibility Restoration Act of 2023*

The Patent Eligibility Restoration Act retains the long-recognized four categories of eligible subject matter: processes, machines, manufactures, and compositions of matter.⁷¹ It then provides a series of exclusions, which it clarifies would be the “only” exclusions.⁷²

65. See 35 U.S.C. § 3; *Gundy v. United States*, 139 S. Ct. 2116, 2123 (2019) (quoting *Mistretta v. United States*, 488 U.S. 361, 372 (1989)) (explaining congressional delegation is permissible only if Congress provides an “intelligible principle”). Some scholars support a delegation approach, though no such proposals have gained traction. See, e.g., John M. Golden, *Patentable Subject Matter and Institutional Choice*, 89 TEX. L. REV. 1041, 1043 (2011) [hereinafter Golden, *Patentable Subject Matter*].

66. *McClurg v. Kingsland*, 42 U.S. 202, 206 (1843) (“[T]he powers of Congress to legislate upon the subject of patents is plenary by the terms of the Constitution . . .”).

67. Prior to the 1950s, the Supreme Court was known for its aggressive policing of patents. See *Jungersen v. Ostby & Barton Co.*, 335 U.S. 560, 572 (1949) (Jackson, J., dissenting) (“[T]he only patent that is valid is one which this Court has not been able to get its hands on.”). These decisions were the impetus for Congress to pass the Patent Act of 1952. See, e.g., Taylor, *Patent Reform, Then and Now*, *supra* note 12, at 433.

68. See Taylor, *Patent Reform, Then and Now*, *supra* note 12, at 433.

69. Golden, *Patentable Subject Matter*, *supra* note 65, at 1091–92 (finding Congress cannot effectively legislate on eligible subject matter because it is “too slow moving,” “too uninformed,” “too liable to special-interest manipulation,” and incapable of consistently engaging in “thorough, careful fact-finding”).

70. See Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 3(a)(2) (2023).

71. S. 2140 § 3(a)(2)(a). PERA also expands the definition of “process” to make clear that *applications* of natural phenomena or laws of nature are patentable. *Id.* § 3(a)(1)(A); cf. Lefstin, *supra* note 23, at 645 (“[M]ore than a century of English and American precedent, [established that] practical application was sufficient to confer patent eligibility.”).

72. S. 2140 § 3(a)(2)(b) (emphasis added). This provision has been criticized as insufficient to overrule the judicial exceptions. See Michael Cicero, *How the Patent Eligibility Restoration Act 2023 Can Be Still Further Improved*, IPWATCHDOG (July 2, 2023, 12:15 PM),

First, pure mathematical formulas are unpatentable, but inventions that apply them are eligible for patent protection.⁷³ Therefore, equations such as the one used in *Diehr* are ineligible standing alone, but because the invention in *Diehr* appeared to apply the equation in an otherwise-eligible process, it would satisfy PERA.⁷⁴ Second, PERA excludes a human gene “as [it] exists in the human body.”⁷⁵ Thus, while the very act of being alive with DNA that is the subject of a patent would not render one liable for patent infringement, genetic researchers that isolate or modify genes would be able to obtain patent protection.⁷⁶ Third, PERA excludes “unmodified natural material[s] . . .”⁷⁷ This provision renders a newly discovered organism or mineral unpatentable, while a genetically modified organism such as the bacterium in *Chakrabarty*, or a synthetic material, would remain eligible.⁷⁸

PERA also excludes any “mental process performed solely in the human mind” and any process that “occurs in nature wholly independent of, and prior to, any human activity.”⁷⁹ Finally, PERA bars processes that are “substantially economic, financial, business, social, cultural, or artistic, even though not less than 1 step in the process refers to a machine or manufacture.”⁸⁰ Lest this provision be too straightforward, there is an exclusion to the exclusion: such a process *is* eligible if it “cannot practically be performed without the use of a machine or manufacture.”⁸¹

In addition to its categorical exclusions, PERA further provides interpretive instructions to courts.⁸² Courts are to consider claims as a whole,⁸³ but courts may *not* consider (1) “the manner in which the

<https://ipwatchdog.com/2023/07/02/patent-eligibility-restoration-act-2023-can-still-improved/id=162923/> [<https://perma.cc/G6UN-UXUQ>]. Nonetheless, PERA’s findings, use of “only,” and the legislative history likely to be generated should be sufficient for courts to abide by PERA if it is enacted. *See* S. 2140 §§ 2, 3(a)(2).

73. S. 2140 § 3(a)(2)(b)(1)(A).

74. *See id.*; *Diamond v. Diehr*, 450 U.S. 175, 184 (1981).

75. S. 2140 § 3(a)(2)(b)(1)(D).

76. *Id.* § 3(a)(2)(b)(2).

77. *Id.* § 3(a)(2)(b)(1)(E).

78. *See id.*; *Diamond v. Chakrabarty*, 447 U.S. 303, 309–10 (1980).

79. S. 2140 § 3(a)(2)(b)(1)(C).

80. *Id.* § 3(a)(2)(b)(1)(B)(i).

81. *Id.* § 3(a)(2)(b)(1)(B)(ii).

82. The proposal also includes brief procedural provisions and a definition of utility which are beyond the scope of this Note. *See id.* §§ 3(a)(1)(B)(k) (defining utility), 3(a)(2)(c)(2) (providing procedural provisions regarding infringement actions).

83. *Id.* § 3(a)(2)(c)(1)(A); *see* *Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

claimed invention was made”;⁸⁴ (2) “whether a claim element is known, conventional, routine, or naturally occurring”;⁸⁵ (3) “the state of the applicable art”;⁸⁶ or (4) any other patentability requirement, such as novelty, nonobviousness, or enablement.⁸⁷

III. JUSTIFYING SUBJECT MATTER RESTRICTIONS

To meaningfully evaluate the subject matter restrictions embodied in PERA, it is helpful to analyze their underlying justifications.⁸⁸ Fortunately, the topic of eligible subject matter and its underlying purposes have not suffered from a shortage of attention as of late.⁸⁹

A. Preemption

The Supreme Court—to the extent it has gone beyond common law and precedent—has largely relied on avoiding preemption to justify its application of the judicial exceptions, which in turn centers on avoiding overbroad claims.⁹⁰ Under this theory, a patent that covers

84. S. 2140 § 3(a)(2)(c)(1)(B)(i). This provision likely aims to ensure patent law will not turn back the clock to the historical invention requirement, which the Supreme Court once held required a “flash of creative genius” for an invention to be patent-eligible. *See Taylor, Patent Reform, Then and Now, supra* note 12, at 439.

85. S. 2140 § 3(a)(2)(c)(1)(B)(ii); *cf. Mayo Collaborative Servs. v. Prometheus Lab’s, Inc.*, 566 U.S. 66, 79–80 (2012) (disregarding a step in a process patent that “tells doctors to engage in well-understood, routine, conventional activity” and reasoning that “those steps, when viewed as a whole, add nothing significant beyond the sum of their parts”).

86. S. 2140 § 3(a)(2)(c)(1)(B)(iii); *cf. Mayo*, 566 U.S. at 89–92 (discussing the respective roles of Section 101 and prior art and finding the two inquiries “might sometimes overlap”).

87. S. 2140 § 3(a)(2)(c)(1)(B)(iv); *cf. Mayo*, 566 U.S. at 89–92 (analyzing the interplay between different patentability requirements and “declin[ing] the Government’s invitation to substitute §§ 102, 103, and 112 inquiries for the better-established inquiry under § 101”).

88. For some, reforming eligible subject matter is as simple as eliminating all restrictions. *See Risch, supra* note 21, at 591. But most do not hold this view. *See, e.g., J. Jonas Anderson, Applying Patent-Eligible Subject Matter Restrictions*, 17 VAND. J. ENT. & TECH. L. 267, 281 (2015).

89. *See Anderson, supra* note 88, at 281; Olson, *supra* note 6, at 181; Tun-Jen Chiang, *Competing Visions of Patentable Subject Matter*, 82 GEO. WASH. L. REV. 1858, 1862 (2014).

90. *See Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216, 223 (2014) (describing preemption as “the concern that drives judicial exceptions” and “undergirds [the Court’s] § 101 jurisprudence”) (citing *Bilski v. Kappos*, 561 U.S. 593, 611–12 (2010)); *Mayo*, 566 U.S. at 82 (noting that prior cases “warn us against upholding patents that claim processes that too broadly preempt the use of a natural law”) (first citing *O’Reilly v. Morse*, 56 U.S. 62, 112–20; and then citing *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972)); *Diamond v. Diehr*, 450 U.S. 175, 187 (1981); Taylor, *Confusing Patent Eligibility, supra* note 3, at 189 (“[T]he Supreme Court has stated that its concern with broad claims is that they preempt the basic building blocks of human ingenuity.”); Rodney Swartz, *Separating Preemption from the Subject Matter Analysis of 35 U.S.C. § 101*, 61 SANTA CLARA L. REV. 903, 921 (2021) (“What the case law has shown is that preemption analysis, at its core, is a

most possible applications of, for example, “risk hedging” would be overbroad, as it preempts others from engaging in the practice generally.⁹¹ Likewise, patents over natural laws would prevent others from engaging with these “building blocks,” potentially causing deleterious effects on innovation.⁹²

Consider, as an example, *O’Reilly v. Morse*.⁹³ Samuel Morse—developer of the telegraph and his eponymous code—filed a patent claim, the breadth of which was “impossible to misunderstand.”⁹⁴ After disclosing his telegraph invention, Morse’s eighth claim provided:

I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specification and claims; the essence of my invention being the use of . . . electro-magnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distances⁹⁵

The Court promptly articulated its concern with the claim:

[S]ome 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 [Morse’s] specification. His invention may be less complicated—less liable to get out of order—less expensive in construction, and in its operation. . . . [W]hile he shuts the door against inventions of other persons, [Morse] would be able to avail himself of new discoveries . . . which scientific men might bring to light.⁹⁶

Morse’s claim was recognized by the Court as unduly broad, generally preempting electronic communication.⁹⁷

It may feel troublesome for inventors to “avail [themselves] of new discoveries,” benefitting from the future work of others.⁹⁸ Likewise, it may seem repugnant to the innovation-inducing aim of patent law for someone to “shut[] the door against inventions of other persons” by patenting the idea of electronic communication.⁹⁹ The Supreme Court

question of claim scope.”) *But see* *Parker v. Flook*, 437 U.S. 584, 589–90 (1978) (reasoning that preemption should not be the sole test of subject matter eligibility).

91. *See Bilski*, 561 U.S. at 611–12.

92. *Alice*, 573 U.S. at 216; *see also* *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (providing examples of unpatentable natural laws).

93. 56 U.S. 62 (1853).

94. *Id.* at 112.

95. *Id.* (emphasis added).

96. *Id.* at 113.

97. *See id.*

98. *Id.* Morse’s claim would capture a wealth of modern technology. *See* Jay Dratler, Jr., *Alice in Wonderland Meets the U.S. Patent System*, 38 AKRON L. REV. 299, 321 (2005) (“Morse’s eighth claim would have covered, among other things, telephone, radio, television, microwave, wireless, and Internet communication . . .”).

99. *Morse*, 56 U.S. at 113. Communicating via electromagnetism would almost certainly be deemed an abstract idea, in addition to its reliance on laws of nature. *See Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 218–20 (2014).

intimated that these concerns exist in the 1850s, both through *Morse* and its admonition in *Le Roy v. Tatham* that “[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.”¹⁰⁰ Nonetheless, it would take nearly another century for the Court to begin legitimizing these concerns doctrinally.¹⁰¹

Unfortunately, establishing preemption as a paramount concern in shaping eligible subject matter has been “misleading and unhelpful.”¹⁰² Patents are inherently preemptive; exclusion of subsequent unauthorized uses, or an entitlement to remuneration for unauthorized uses, embodies the core of the patent right.¹⁰³ Thus, separating permissible and impermissible preemption under Section 101 would seemingly require some form of objective criteria.¹⁰⁴ Nonetheless, the Supreme Court has not provided any—rendering this analysis inordinately vexatious when applied to claims that do not directly claim natural laws or phenomena as such.¹⁰⁵ Moreover, assessing a claim’s breadth is necessarily a comparative exercise.¹⁰⁶ Without points of comparison—which other patentability requirements derive from patent applications and other “prior art”—claim breadth can only be measured subjectively.¹⁰⁷ These are the precise issues that have fostered the muddling of eligible subject matter doctrine.

A twofold solution is necessary. First, patrolling claim breadth should be left to the existing statutory requirements that already do so, particularly Section 112.¹⁰⁸ Among other things, Section 112 requires

100. *Morse*, 56 U.S. at 113; *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852).

101. *See Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948).

102. Sarnoff, *supra* note 26, at 91.

103. *See, e.g., Joyce C. Li, Preemption, Diagnostics, and the Machine-or-Transformation Test: Federal Circuit Refinement of Biotech Method Eligibility*, 32 BERKELEY TECH. L.J. 379, 381 (2017).

104. *See Taylor, Confusing Patent Eligibility*, *supra* note 3, at 191–97.

105. *See id.*

106. *Id.* at 190–91.

107. 35 U.S.C. §§ 102, 103, 112; *see Taylor, Confusing Patent Eligibility*, *supra* note 3, at 190–97.

108. *See Ananya Pillutla, Preventing Preemption: Promise of the Nonobviousness Requirement*, 12 N.Y.U. J. INTELL. PROP. & ENT. L. 353, 354–55 (2023); Swartz, *supra* note 90, at 929–31; Taylor, *Confusing Patent Eligibility*, *supra* note 3, at 191–97; Max Stul Oppenheimer, *Patents 101: Patentable Subject Matter and Separation of Powers*, 15 VAND. J. ENT. & TECH. L. 1, 40 (2012) (noting how Section 112 and Section 101’s utility requirement can prevent premature monopolies which would “foreclos[e] further development”). In *Mayo*, the Supreme Court found Section 101 needed to separately address claim breadth because natural laws and phenomena are not awarded prior art status, reducing the ability of existing requirements to address claim breadth. *See Mayo Collaborative Servs. v. Prometheus Lab’s, Inc.*, 566 U.S. 66, 90–91 (2012); Sarnoff, *supra* note 26, at 53 (arguing prior art status should be afforded to natural phenomena and natural laws). But there is reason to believe *Mayo*’s analysis is incomplete. *See Taylor*,

the patent application “enable any person skilled in the art . . . to make and use the [invention].”¹⁰⁹ This enablement requirement demands that patent applications teach the full scope or breadth of their claims.¹¹⁰ This is why, notwithstanding *Morse*’s implications on eligible subject matter, the case was correctly decided on grounds that would likely render it a Section 112 case under today’s patent law.¹¹¹ *Morse*’s specification did not enable the technicians of the day to “make and use” all potential forms of electronic communication.¹¹² In other words, *Morse* failed to fulfill his side of the patent system’s disclosure-for-monopoly quid pro quo.¹¹³ Leaving claim-breadth concerns to other patentability requirements, such as Section 112, does not rest on the premise that the existence of other capable statutory provisions precludes Section 101 from combatting overbroad claims.¹¹⁴ Rather, the argument rests on the idea that these other statutes are more apt and appropriate for addressing concerns of preemption and claim breadth.¹¹⁵

Second, claims on a preexisting natural law or phenomenon as such should be deemed ineligible; those that apply it as part of an otherwise patentable process, machine, manufacture, or composition of matter, however, should be eligible.¹¹⁶ Such an approach is consistent with the historical principles from which the Supreme Court developed the judicial exceptions.¹¹⁷ It has also garnered support from members of the Federal Circuit.¹¹⁸ A coherent integration of preemption concerns into eligible subject matter doctrine requires nothing more.

Confusing Patent Eligibility, *supra* note 3, at 195 (“As it turns out, the [Section 112] requirements probably close any loophole left by [Sections 102 and 103] with respect to the concern over the breadth of claims.”).

109. 35 U.S.C. § 112(a).

110. *See Amgen Inc. v. Sanofi*, 598 U.S. 594, 610 (2023).

111. Oppenheimer, *supra* note 108, at 15.

112. *See Amgen Inc.*, 598 U.S. at 606–07 (discussing *Morse* in the context of section 112).

113. *See Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 63 (1998).

114. *Cf.* John M. Golden, *Redundancy: When Law Repeats Itself*, 94 TEX. L. REV. 629, 633 (2016) (arguing repetition of requirements in legal regimes can be beneficial).

115. Taylor, *Confusing Patent Eligibility*, *supra* note 3, at 190.

116. *See Lefstin*, *supra* note 23, at 645 (“[W]hen Funk Brothers introduced the notion of inventive application in 1948, the case broke radically with a century of English and American precedent, under which *practical application* was sufficient to confer patent eligibility.”) (emphasis added).

117. *See id.* at 608–09.

118. *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 927 F.3d 1333, 1335 (Fed. Cir. 2019) (Lourie, J., concurring) (“If I could write on a clean slate, I would write as an exception to patent eligibility, as respects natural laws, only claims directed to the natural law itself, e.g., $E=mc^2$, $F=ma$, Boyle’s Law, Maxwell’s Equations, etc. I would not exclude uses or detection of natural laws.”).

1. Mathematical Formulas and Natural Processes

Consistent with these recommendations, PERA proposes excluding mathematical formulas, but not their application in an otherwise-patentable invention.¹¹⁹ Thus, Einstein could not have patented $E=mc^2$.¹²⁰ If, however, Einstein had sought to patent a process of producing energy via nuclear fusion, it would appear eligible under PERA because it applies the natural mass-energy relationship in a manner that is not subject to any of PERA's exclusions.¹²¹ Natural laws are traditionally expressed in mathematical terms, rendering them ineligible for patent protection under PERA.¹²² Patent applicants represented by sophisticated legal counsel, however, are also notoriously creative drafters; thus, if Einstein claimed the mass-energy relationship without quantifying it, he could arguably avoid a mathematical formula exclusion.¹²³ In these cases, PERA has another proposed exclusion that may prevent such legally crafted bypasses.

Specifically, PERA proposes exclusion of preexisting natural processes.¹²⁴ Under this provision, Einstein likely could not have patented the relationship between mass and energy, even qualitatively, because nuclear fusion has converted mass to energy in stars since time immemorial.¹²⁵ This reasoning holds true for a range of potentially-preemptive claims that fail to apply a natural law or process in a non-natural way.¹²⁶ PERA also dispenses with the application of other patentability requirements in the eligible subject matter inquiry, allowing these sections to address issues of claim breadth.¹²⁷

119. Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 3(a)(2)(b)(1)(A) (2023).

120. *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66, 71 (2012).

121. See S. 2140 § 3(a)(2)(b)(1)(A). But this hypothetical patent would have to cover a particular, nonnatural fusion process, rather than preempting the entirety of nuclear fusion. See *id.* § 3(a)(2)(b)(1)(C)(ii).

122. *Id.* § 3(a)(2)(b)(1)(A).

123. See Dan L. Burk & Brett H. McDonnell, *Patents, Tax Shelters, and the Firm*, 26 VA. TAX REV. 981, 1001 (2007) (“[P]ast prohibitions against software patents were easily elided by drafting patent claims so as to avoid the term ‘software’ and instead drafting in terms of some other subject matter . . .”).

124. S. 2140 § 3(a)(2)(b)(1)(C)(ii).

125. See Megan Alexa MacKay, *Property Rights in Celestial Bodies: A Question of Pressing Concern to All Mankind*, 104 MARQ. L. REV. 575, 579 n.19 (2020).

126. For example, while the application of the Arrhenius equation from *Diehr* would remain eligible, the Arrhenius equation itself would be unpatentable—even when described qualitatively—because it is a natural process that occurs in chemical reactions independently of, and prior to, human activity. See S. 2140 § 3(a)(2)(b)(1)(C)(ii).

127. S. 2140 § 3(a)(2)(c)(1)(B)(iv). Even opponents of PERA advocate for the role of Section 112 in patrolling overbroad claims. See, e.g., High Tech Inventors All., Comment Letter on Request

B. Utilitarianism

Utilitarianism, which is generally understood as the aim to promote aggregate “utility” or happiness, has achieved consensus as the objective of the patent system.¹²⁸ Viewed through this lens, eligible subject matter presents a conceptually straightforward problem.¹²⁹ Patents can provide societal benefits by way of requiring disclosure and incentivizing innovation, and they carry attendant costs, such as the ability of the patent holder to extract monopoly rents from consumers.¹³⁰ Utilitarianism counsels cost-benefit analysis of these countervailing forces to maximize aggregate social good.¹³¹

There is, however, an inability to quantitatively justify subject matter restrictions on these grounds consistently and meaningfully.¹³² In response, more workable, qualitative frameworks have been proposed that focus on the necessity of patent incentives for the invention.¹³³ Relevant factors in evaluating alternative incentives for development of an invention include self-consumption of the invention, availability of other intellectual property regimes including trade secret law, and low research and development costs.¹³⁴ Ideally, applying these

for Information Regarding Patent Eligibility Jurisprudence Study at 14 (Sept. 2, 2021), <https://www.regulations.gov/comment/PTO-P-2021-0032-0127> [<https://perma.cc/R5PS-Q26G>].

128. See JOHN STUART MILL, UTILITARIANISM 10 (1863) (“[T]he Greatest Happiness Principle, holds that actions are right in proportion as they tend to promote happiness . . .”); Golden, *Patentable Subject Matter*, *supra* note 65, at 1043 (analyzing eligible subject matter according to “patent law’s commonly accepted utilitarian ends”). The Framers also spoke of the intellectual property system in seemingly utilitarian terms. See THE FEDERALIST NO. 43, at 271–72 (James Madison) (Clinton Rossiter ed., 1961) (discussing the “utility” of Congress’s intellectual property powers and noting that the patent system “fully coincides” with “[t]he public good”). This Note follows the contemporary trend of analyzing the utilitarian aims of patent law through an economic lens. See, e.g., Olson, *supra* note 6, at 195–204 (engaging economic analysis to support subject matter discriminations on the basis of utilitarianism). While perhaps not wholly faithful to utilitarianism as a philosophy, this approach is justifiable for want of alternatives, and it represents a conflation that has been present in legal debates for decades. See Richard A. Posner, *Utilitarianism, Economics, and Legal Theory*, 8 J. LEGAL STUD. 103, 103 (1979).

129. See Golden, *Patentable Subject Matter*, *supra* note 65, at 1073–74.

130. See Olson, *supra* note 6, at 194–204.

131. See *id.*

132. See Golden, *Patentable Subject Matter*, *supra* note 65, at 1064–74; Yuqing Cui, *A Quantitative Approach to Determining Patentable Subject Matter*, 30 HARV. J.L. & TECH. 629, 632 (2017).

133. See, e.g., Maayan Perel, *Reviving the Gatekeeping Function: Optimizing the Exclusion Potential of Subject Matter Eligibility*, 23 ALB. L.J. SCI. & TECH. 237, 238 (2013). While Perel is explicitly against categorical exclusions due to inherent over- and under-inclusivity, her approach nonetheless provides meaningful insight into the likelihood of a patent being justifiable on utilitarian grounds. See *id.* These factors also mirror those applied by Olson. See Olson, *supra* note 6, at 228–30.

134. Perel, *supra* note 133, at 284–85, 287.

criteria would entail assessing each patent application and denying those with a net negative impact.¹³⁵ Yet such an extensive individualized assessment is impractical.¹³⁶ The ubiquity of transaction costs and resource constraints at the USPTO renders this approach unmanageable and, ultimately, nonutilitarian.¹³⁷ Because individualized assessment is impractical, categorical subject matter exclusions are generally preferable.¹³⁸

Several such exclusions have been proposed on utilitarian grounds, but business methods are the exemplar.¹³⁹ The business method exclusion—which previously existed without endorsement by a majority of the Supreme Court—carries its own lengthy history, but it is sufficient to note that there is broad agreement that business method patents are generally not justifiable from a utilitarian perspective.¹⁴⁰ This is so because businesses can develop new business methods cheaply, and they have ample incentive without the availability of patents, rendering the concomitant potential for monopoly rents unjustifiable.¹⁴¹

1. Economic, Financial, Business, Social, Cultural, and Artistic Processes

While utilitarianism generally justifies exclusion of business method patents, defining the boundaries of this category can be “maddeningly complex.”¹⁴² PERA confronts this issue by prohibiting process inventions that are “substantially economic, financial, [or]

135. Olson, *supra* note 6, at 201; *see* Perel, *supra* note 133, at 284.

136. *See* Olson, *supra* note 6, at 201, 203; Anderson, *supra* note 88, at 287.

137. *See* Olson, *supra* note 6, at 201, 203; Anderson, *supra* note 88, at 287.

138. *See* Anderson, *supra* note 88, at 287; Golden, *Patentable Subject Matter*, *supra* note 65, at 1054, 1060.

139. *See* Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1029–30 (1990) (arguing against patents on software, computer science, and algorithms); John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1143, 1175–76 (1999) (discussing patents in “liberal professions,” such as law, medicine, and teaching and advocating for an “industrial application” requirement); Anderson, *supra* note 88, at 284 (arguing against patents on business methods).

140. *See, e.g.*, Olson, *supra* note 6, at 228–32. This broad agreement does not extend to software patents, which are far more contentious. Perel, *supra* note 133, at 262. Importantly, the business method exclusion has not been adopted, largely because there is no textual basis for the distinction. *See* Olson, *supra* note 6, at 218–22 (providing background on the proposed, since-discredited business method exclusion); Perel, *supra* note 133, at 262–63.

141. *See* Olson, *supra* note 6, at 222.

142. Anderson, *supra* note 88, at 289–90.

business[.]”¹⁴³ These processes can provide a direct pecuniary benefit to their inventor regardless of patent incentives. For example, an investment firm does not need a patent on its proprietary trading methods.¹⁴⁴ It simply takes market positions consistent with its methods, generating profits. These firms also have independent intellectual property regimes to protect their interest, namely trade secrecy, reducing the necessity of patent incentives.¹⁴⁵

PERA also excludes processes that are “substantially . . . social, cultural, or artistic[.]”¹⁴⁶ Processes for networking, dancing, celebrating a holiday, or creating paintings may not appear to constitute “inventions,” and thus fall beyond the pale of what should be eligible for patentability.¹⁴⁷ To put it in utilitarian terms, however, the clearest reason patent incentives are unnecessary is that these processes are self-consumed by the inventor.¹⁴⁸ An activity in these categories is done largely for its own sake, as most people share the intrinsic need to socialize, the inherent tendency to develop shared culture, and the desire to create. Additionally, there is generally a *de minimis* cost of developing such a process, rendering potential patent rights to recoup costs superfluous.¹⁴⁹

PERA adds a further wrinkle to these two exclusions by conferring eligibility on these processes when they “cannot practically be performed without the use of a machine or manufacture.”¹⁵⁰ Because computers are a machine under Section 101, the chief implication of this provision is that it extends eligibility to computer-implemented inventions.¹⁵¹ The utilitarianism literature is equivocal on this approach.¹⁵² There are also tertiary consequences to extending eligibility to processes that require a “manufacture,” rather than a “machine.”¹⁵³ In particular, PERA’s findings suggest that while

143. Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 3(a)(2)(b)(1)(B)(i) (2023).

144. See Burk & McDonnell, *supra* note 123, at 986–90 (exploring the implications of investment strategy patents under strong and weak forms of the efficient market hypothesis).

145. See *id.*

146. S. 2140 § 3(a)(2)(b)(1)(B)(i).

147. See 35 U.S.C. § 101.

148. Perel, *supra* note 133, at 287.

149. See *id.*

150. S. 2140 § 3(a)(2)(b)(1)(B)(ii).

151. See, e.g., Dustin J. Corbett, *A Premier Paradigm Shift: The Impact of Artificial Intelligence on U.S. Intellectual Property Laws*, 17 LIBERTY UNIV. L. REV. 321, 339 (2023).

152. See Miriam Bitton, *Patenting Abstractions*, 15 N.C. J.L. & TECH. 152, 219 (2014). In effect, PERA recognizes that software and business methods are not mutually exclusive, and at their intersection, PERA would err in favor of patentability. See S. 2140 § 3(a)(2)(b)(1)(B).

153. See *infra* Section IV.B.2.

machine- or computer-implemented inventions are intended to be eligible, those requiring a mere manufacture are not.¹⁵⁴

C. Normative, Moral, and Religious Principles

Normative, moral, and religious principles overlap with both utilitarianism—itsself a normative framework—and preemption, which may rest on the concern of a patentee being unfairly enriched by the future work of others.¹⁵⁵ These normative, moral, and religious concerns, however, are not wholly addressed by utilitarianism and preemption.¹⁵⁶

1. Sanctity of Nature

A range of normative, moral, and religious principles converge in reaching the conclusion that nature is unpatentable.¹⁵⁷ The most obvious rationale stems from creationist beliefs; this religious perspective holds that nature belongs to the Creator.¹⁵⁸ Likewise, secular morality may justify nature as “part of the storehouse of knowledge of all [people]. . . . [F]ree to all [people] and reserved exclusively to none.”¹⁵⁹ A perspective inspired by the writings of John Locke would also bar patents on pure nature, as an individual who merely observes nature has not expended the requisite labor to obtain a legitimate property entitlement.¹⁶⁰

Understood through either religious or secular beliefs, the dividing line for the judicial exceptions is the perception of their preexistence and independence from human intervention.¹⁶¹ Mirroring the Court’s holding in *Chakrabarty*, the above perspectives would unanimously reject a patent on newly discovered bacteria, but none

154. See *infra* Section IV.B.2.

155. See *supra* Section III.A.

156. See Chiang, *supra* note 89, at 1859.

157. *Id.* at 1877.

158. *Id.* at 1877–78, 1877 n.71 (citing *Psalms* 24:1 (“The earth is the Lord’s . . .”).

159. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948); see Chiang, *supra* note 89, at 1878 n.75.

160. See Chiang, *supra* note 89, at 1878; Sarnoff, *supra* note 26, at 85–88; JOHN LOCKE, SECOND TREATISE ON CIVIL GOVERNMENT Ch. 5, § 27 (Project Gutenberg 2003) (1690) (theorizing that property entitlements in natural products require a person to “mix[] [their] labour” with nature).

161. Chiang, *supra* note 89, at 1879–80. Understanding the judicial exceptions this way illustrates how far modern doctrine has strayed from the roots of the abstract ideas exception. See *id.*

conflict with the idea that a genetically-modified bacterium is the proper subject of a patent.¹⁶²

Consistent with these perspectives, PERA proposes excluding both preexisting natural processes and natural materials.¹⁶³ This ensures that no person can lay an exclusive claim over nature, which has been a cornerstone of patent law in the United States since its inception.¹⁶⁴ PERA would, however, provide for patents on applications of these natural materials or processes in otherwise-patentable inventions.¹⁶⁵

2. Free Thought

Free thought is another prominent principle with substantial implications for eligible subject matter. In particular, the mental steps doctrine has long prohibited patents on mental processes.¹⁶⁶ Because of its longstanding prevalence in judicial considerations regarding abstract ideas, the doctrine would ostensibly be justified by traditional preemption concerns, but the innate relationship between the mental steps doctrine and the principle of free thought is unavoidable.¹⁶⁷ Free thought plays a central role in modern criminal law, and its importance has been lauded in constitutional contexts by some of the United States' most vaunted jurists.¹⁶⁸ It would thus appear desirable to avoid creating

162. See *Diamond v. Chakrabarty*, 447 U.S. 303, 309–10 (1980) (“[The] micro-organism plainly qualifies as patentable subject matter . . . [It is] a product of human ingenuity[.]”). Genetically-modified bacteria are created by humans, not the Creator; they are not part of the “storehouse of knowledge” because they did not previously exist in nature; most pointedly, they require labor input, justifying the property entitlement from a Lockean perspective. See Chiang, *supra* note 89, at 1876–78.

163. Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. §§ 3(a)(2)(b)(1)(E), 3(a)(2)(b)(1)(C)(ii) (2023).

164. See Lefstin, *supra* note 23, at 569–70.

165. See S. 2140 §§ 3(a)(2)(a), 3(a)(2)(b)(2)(B). By allowing patents on isolated natural materials, PERA would codify a famous decision by Judge Learned Hand. See *Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 98–99 (C.C.S.D.N.Y. 1911) (allowing a patent on isolating a naturally-occurring chemical, adrenaline), *aff'd in part, rev'd in part*, 196 F. 496 (2d Cir. 1912); see also Chiang, *supra* note 89, at 1886–90 (comparing *Parke-Davis* and *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013)).

166. See Olson, *supra* note 6, at 209 n.93 (citing early cases denying patents for mental processes); see also *In re Killian*, 45 F.4th 1373, 1384 (Fed. Cir. 2022) (reaffirming the validity of the mental steps doctrine), *cert. denied*, No. 22-1220, 2023 WL 6377962 (U.S. Oct. 2, 2023).

167. See Chiang, *supra* note 89, at 1881.

168. See *United States v. Schwimmer*, 279 U.S. 644, 654–55 (1946) (Holmes, J., dissenting) (“[I]f there is any principle of the Constitution that more imperatively calls for attachment than any other it is the principle of free thought . . .”); *Palko v. Connecticut*, 302 U.S. 319, 327 (1937) (“[F]reedom [of thought and speech] . . . is the matrix, the indispensable condition, of nearly every other form of freedom.”). In the context of criminal law, thoughts alone are generally insufficient

infringement liability through the mere act of thinking, suggesting that free thought could independently justify the mental steps doctrine.¹⁶⁹

Resting the mental steps doctrine solely on the principle of free thought, however, would likely require narrowing its scope. As applied, the doctrine excludes not only mental processes, but also processes that *could be* performed mentally, potentially with the aid of pen and paper.¹⁷⁰ The result is that large swaths of software and computer-implemented inventions are, or may be, unpatentable.¹⁷¹ Such an extension is likely not justifiable from the principle of free thought, and it is therefore better addressed by utilitarianism.¹⁷²

PERA proposes excluding wholly mental processes, but not those with mere mental steps.¹⁷³ This represents a perspective consistent with a respect for free thought, and this narrowing of the mental steps doctrine will expand the availability of patent protection for software and other computer-implemented inventions.¹⁷⁴

3. The Human Body as Property

Recognition of property rights over the human body is a contentious, oft-debated subject with clear moral and normative implications.¹⁷⁵ As applied to patents, Congress has responded to this concern in part by providing that patents regarding human cloning are disallowed.¹⁷⁶ The central contemporary debate on this subject is the

for a conviction. See MODEL PENAL CODE § 2.01 (AM. L. INST. 1962) (requiring a voluntary act or omission to establish culpability).

169. See Bitton, *supra* note 152, at 168; Kevin Emerson Collins, *Propertizing Thought*, 60 SMU L. REV. 317, 329–31 (2007).

170. See, e.g., Ben Hattenbach & Gavin Snyder, *Rethinking the Mental Steps Doctrine and Other Barriers to Patentability of Artificial Intelligence*, 19 COLUM. SCI. & TECH. L. REV. 313, 324 (2018) (quoting *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC*, 135 F. Supp. 3d 1175, 1186–87 (D. Haw. 2015), *aff'd*, 669 F. App'x 555 (Fed. Cir. 2016)) (discussing an invalidation on “a process that a person *could* perform using a pen, paper, and her own brain,” even though the process contemplated non-mental steps) (emphasis added).

171. See *id.* at 322–24.

172. See Olson, *supra* note 6, at 209–10 (discussing the mental steps doctrine from a utilitarian perspective).

173. Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 3(a)(2)(b)(1)(C)(i) (2023).

174. See *id.*; Olson, *supra* note 6, at 209–10.

175. See, e.g., Erin Colleran, *My Body, His Property?: Prescribing A Framework to Determine Ownership Interests in Directly Donated Human Organs*, 80 TEMP. L. REV. 1203, 1203 (2007).

176. David O. Taylor, *Immoral Patents*, 90 MISS. L.J. 271, 291–92 (2021) (citing Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 33(a), 125 Stat. 284, 340 (2011)).

patentability of DNA.¹⁷⁷ The Supreme Court, while conspicuously circumventing moralistic arguments, has held DNA to be unpatentable, even when isolated from the human body.¹⁷⁸

Patenting DNA as it exists in the human body carries enormously greater moral concerns than does isolated DNA because all people carry natural DNA, while only a select few engage in research or use of isolated DNA.¹⁷⁹ Thus, the impacts of the patent right via infringement liability are highly asymmetrical between the two alternatives. Additionally, genetic research is protected in some measure by the fact that patents may be obtained on DNA derivatives, including cDNA.¹⁸⁰ Taken together, these observations palliate the most extreme perspectives on both sides of the DNA patent debate.¹⁸¹ PERA takes a clear stance on this topic by explicitly providing for patent protection of isolated DNA.¹⁸²

IV. PROVIDING CLARITY AND PROMOTING INNOVATION

The proposal embodied in PERA is largely consistent with the recommendations of patent law scholars.¹⁸³ In particular, it properly restricts the role of preemption to exclude patents on natural processes and mathematical formulas.¹⁸⁴ PERA also excludes the least justifiable processes from a utilitarian perspective.¹⁸⁵ Finally, PERA reaffirms long-held moral and religious perspectives that bar patents on nature and mental processes.¹⁸⁶ While these attributes of PERA can both clarify the law and incentivize innovation, it is not a panacea. This Part provides two recommendations to improve PERA: a simple amendment stating when claim elements may be disregarded to provide further clarity, and a mechanism to disallow patents on business methods or cultural processes that require manufactures, but not machines, to further effectuate PERA's intent and the patent system's utilitarian objectives.

177. See Jorge L. Contreras, *Narratives of Gene Patenting*, 43 FLA. ST. U.L. REV. 1133, 1133 (2016).

178. See Chiang, *supra* note 89, at 1873–74 (citing *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013)).

179. See Contreras, *supra* note 177, at 1165–66.

180. See *Myriad*, 569 U.S. at 594.

181. See Contreras, *supra* note 177, at 1158–60, 1167–69.

182. Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 3(a)(2)(b)(2) (2023).

183. See Chiang, *supra* note 89, at 1873–81; Olson, *supra* note 6, at 228–32; Taylor, *Confusing Patent Eligibility*, *supra* note 3, at 190–97.

184. See S. 2140 §§ 3(a)(2)(b)(1)(A), 3(a)(2)(b)(1)(C)(ii).

185. See *id.* § 3(a)(2)(b)(1)(B).

186. See *id.* §§ 3(a)(2)(b)(1)(C)–(E).

A. Disregarding Claim Elements

Suppose a judge is confronted with a simple patent claim where a computer tracks the debts and credits of two parties, would it be patent-eligible under PERA? This appears to be a process that is “substantially . . . financial[.]”¹⁸⁷ On the one hand, tracking the debts and credits of two parties would appear to be a practicable mental process that does not require a computer, and it would therefore be ineligible.¹⁸⁸ On the other hand, PERA would require courts to consider claims “as a whole and without discounting or disregarding *any* claim element,” and this hypothetical claim requires a computer.¹⁸⁹ Thus, these provisions give rise to a contradiction.

If courts could not disregard claim elements, then all claims that “refer[] to a machine or manufacture” could not be performed without one.¹⁹⁰ Because PERA’s findings state that “non-essential reference[s] to a computer” are insufficient to establish eligibility, it is evident that PERA’s authors intended certain claim elements to be overlooked.¹⁹¹ Therefore, PERA should be amended to make clear when claim elements may be disregarded. This could be achieved simply by adding “except as required under § 101(b)(1)(B)” or “subject to § 101(b)(1)(B)” to PERA’s prohibition on disregarding claim elements.¹⁹² This amendment would not only save stakeholders from navigating unnecessary ambiguity, but it would also ensure PERA’s authors see their intent, as reflected in PERA’s findings, given effect.

B. Machines, Not Manufactures

If courts and patent examiners are able to disregard claim elements in determining whether a process “cannot practically be performed without the use of a machine or manufacture,” a framework will be necessary to determine when elements are appropriately disregarded.¹⁹³ This Section predicts how this provision would likely be interpreted, as well as explaining why it should be amended to exclude manufactures.

187. *Id.* § 3(a)(2)(b)(1)(B)(i).

188. *See id.* § 3(a)(2)(b)(1)(B)(ii).

189. *Id.* § 3(a)(2)(c)(1)(A) (emphasis added).

190. *See id.* §§ 3(a)(2)(c)(1)(A), 3(a)(2)(b)(1)(B)(ii).

191. *See id.* § 2(5)(E)(i).

192. *See id.* § 3(a)(2)(c)(1)(A).

193. *See id.* § 3(a)(2)(b)(1)(B)(ii).

1. A Purpose-Based Test

The most likely framework for determining whether a process can “practically be performed” after disregarding claim elements is whether the process’s purpose, objective, or the result from which it derives its utility can be substantially achieved without the omitted claim element(s).¹⁹⁴ This approach is derived principally from PERA’s text, with support from utilitarian values and case law from the Federal Circuit.¹⁹⁵

The term “practically” is defined to mean “almost,” “nearly,” or “in a practical manner.”¹⁹⁶ One definition of “practical” is “adapted or designed for actual use,” or “useful.”¹⁹⁷ These textual cues indicate that (1) a process’s purpose or utility is a necessary consideration, and (2) near or substantial achievement of this purpose or utility without omitted claim elements should render claims ineligible.

This interpretation is bolstered by utilitarianism, as the utility of an invention is a key driver of the “benefit” side of the cost-benefit analysis undergirding the welfare-increasing aim of the patent system.¹⁹⁸ As explained, the class of “substantially economic, financial, business, social, cultural, [and] artistic” processes are rightfully viewed with suspicion from a utilitarian perspective.¹⁹⁹ By orienting this portion of the subject matter inquiry toward utility—and extending eligibility only for those inventions that see their purpose substantially frustrated by omitted claim elements—patent law can further serve its core objective.

Finally, this test echoes reasoning from the Federal Circuit’s eligible subject matter jurisprudence that existed prior to the Supreme Court’s tetralogy on the subject in the 2010’s.²⁰⁰ In *State Street Bank v. Signature Financial*, the court set forth a broad test for eligibility, holding the disputed business method eligible “because it produces ‘a useful, concrete and tangible result.’”²⁰¹ The court also noted that

194. *See id.*

195. *See id.*; *State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1374 (Fed. Cir. 1998), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008).

196. *Practically*, DICTIONARY.COM, <https://www.dictionary.com/browse/practically> [<https://perma.cc/D6RU-E4BM>] (last visited Feb. 27, 2024).

197. *Practical*, DICTIONARY.COM, <https://www.dictionary.com/browse/practical> [<https://perma.cc/W68P-FNC9>] (last visited Feb. 27, 2024).

198. *See Olson*, *supra* note 6, at 199 (providing illustrations of relationships between utility and deadweight loss of inventions).

199. *See S. 2140 § 3(a)(2)(b)(1)(B)(i)*; *supra* Section III.B.

200. *See, e.g., Hoyt*, *supra* note 55, at 409–19.

201. *See State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1374 (Fed. Cir. 1998), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008).

“[g]iven the complexity of the calculations [covered by the claim], a computer or equivalent device is a *virtual necessity to perform the task*.”²⁰² The court’s focus on “result[s],” and the inquiry into whether the “device is a virtual necessity to perform the task” comports well with this framework.²⁰³

2. Machine Versus Manufacture

Applying PERA’s current language may fail to yield the results desired by its authors in some instances. For example, assume a patent claim outlines a process for obtaining a wedding ring, taking a knee, and proposing, with the purpose of increasing the likelihood of receiving a “yes” in response. Such a process is “substantially . . . social, [or] cultural,” and—at least for the modal proposer—excluding the wedding ring could significantly impair the efficacy of this process.²⁰⁴ Because an engagement ring is a “manufacture” under Section 101 and omitting the ring would likely frustrate the process’s purpose, it would appear it “cannot practically be performed without the use of . . . manufacture.”²⁰⁵ This interpretation would render the process eligible.²⁰⁶ PERA’s findings, however, explicitly state that processes for “offering marriage proposals” are to be ineligible.²⁰⁷

The marriage proposal illustration is but one example of a recurring theme: most problematic examples of processes that could arguably be eligible under PERA require “manufacture[s],” not “machine[s].”²⁰⁸ A “manufacture” is any “tangible article that is given a

202. *Id.* at 1371 (emphasis added).

203. *See id.* at 1371, 1374.

204. *See* S. 2140 § 3(a)(2)(b)(1)(B). Engagement and wedding rings have long been a cultural norm in Western civilization and, though it may be beginning to wane in the United States, it is still a widely expected practice. *See, e.g.,* Abby Ellin, *Men Who Don’t Wear Wedding Bands—and Why*, N.Y. TIMES (May 7, 2016), <https://www.nytimes.com/2016/05/08/fashion/weddings/trump-men-wedding-rings.html> [<https://perma.cc/8YSM-TPLX>].

205. *See* S. 2140 § 3(a)(2)(b)(1)(B)(ii); *In re Wang*, 737 F. App’x 534, 535–36 (Fed. Cir. 2018) (quoting *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1349 (Fed. Cir. 2014)) (“[A] manufacture . . . must be a tangible article that is given a new form, quality, property, or combination through man-made or artificial means.”); *see also* *Gemstone Encased in Ring*, U.S. Patent No. 6,851,278 (filed May 7, 2003) (issued Feb. 8, 2005) (describing a patent for “wedding or engagement rings having gemstones”).

206. *See* S. 2140 § 3(a)(2)(b)(1)(B)(ii).

207. S. 2140 § 2(5)(E)(i).

208. At a Senate hearing on PERA in January 2024, discussion occasionally centered briefly on hypothetical patents on football plays. *The Patent Eligibility Restoration Act – Restoring Clarity, Certainty, and Predictability to the U.S. Patent System Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 118th Cong. (2024) (statement of Philip S. Johnson, Chair, Steering Comm. Coal. for 21st Century Pat. Reform). While witnesses disagreed, it appears that

new form, quality, property, or combination through man-made or artificial means,” which includes an array of mundane, everyday objects such as pencils, paper, wedding rings, or footballs.²⁰⁹ A “machine,” by contrast, is a “concrete thing, consisting of parts, or of certain devices and combination of devices,” such as engines or computers.²¹⁰

Because manufactures include such a wide range of everyday objects, their inclusion in this provision may extend eligibility to a range of unintended processes, but this concern does not necessarily translate to machines. Consider a business process claim discussed in a January 2024 Senate hearing on PERA.²¹¹ The process aims to optimize the price of a product by e-mailing offers at various prices, compiling who expresses interest at what price, and automatically adjusting the price structure accordingly, all on a computer.²¹² Excluding the computer would require alternative means of distributing the offers, compiling data, and calculating the adjusted price, thereby reducing the ease of performing the process. Nonetheless, this additional effort may not substantially frustrate the process’s primary purpose: optimizing the product’s price.

Consequently, PERA should be amended to allow patents on “substantially economic, financial, business, social, cultural, or artistic” processes *only* if they “cannot practically be performed without the use of a machine.”²¹³ This amendment would further the legislative intent of PERA’s authors.²¹⁴ It would also reduce the availability of process inventions that are more likely to have negative utilitarian implications, including business methods and cultural processes.

such a patent would be eligible under PERA because omitting the football would make it impractical to run the play. *See id.*

209. *See* *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1349 (Fed. Cir. 2014).

210. *See id.*

211. *See The Patent Eligibility Restoration Act – Restoring Clarity, Certainty, and Predictability to the U.S. Patent System Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 118th Cong. (2024) (testimony of Hon. David J. Kappos, Partner, Cravath, Swain & Moore LLP) (citing *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015)).

212. *See id.*; *OIP Techs., Inc.*, 788 F.3d at 1360, 1362 (holding the claim ineligible).

213. *See The Patent Eligibility Restoration Act – Restoring Clarity, Certainty, and Predictability to the U.S. Patent System Before the Subcomm. on Intell. Prop. of the S. Comm. on the Judiciary*, 118th Cong. (2024) (statement of Philip S. Johnson, Chair, Steering Comm. Coal. for 21st Century Pat. Reform).

214. *See generally* Patent Eligibility Restoration Act of 2023, S. 2140, 118th Cong. § 2(5)(E) (2023).

V. CONCLUSION

Eligible subject matter demands clarity for both doctrinal and economic reasons. Further, because the Supreme Court has steadfastly refused to hear cases raising Section 101 questions, any near-term clarity must come from congressional action. PERA—the most recent attempt at congressional action—provides a proposal that would substantially reduce uncertainty among patent law stakeholders, while also promoting productive innovation. Nonetheless, PERA suffers from two shortcomings. First, it must be amended to clarify when claim elements may be disregarded. Second, PERA should not extend eligibility to all processes that require a manufacture. These amendments would reduce ambiguity, the occurrence of welfare-reducing patents, and the incoherence between PERA’s findings and text. In sum, enactment of an amended PERA would improve both the United States economy and the functioning of the patent system.

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