

Notes

The Collapse of *Alice*'s Wonderland: *Mayo*'s Faulty Two-Step Framework and a Possible Solution to Patent-Eligibility Jurisprudence

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In Mayo Collaborative Services v. Prometheus Laboratories, Inc., the Supreme Court established a two-step framework to determine whether a supposed invention that involves a “natural law” can be a patent-eligible subject matter. Two years later, the Supreme Court extended this framework in Alice Corp. v. CLS Bank International to “abstract ideas,” and cemented the framework as the test to determine patent-eligible subject matter. Recent cases demonstrate that this framework has collapsed from a two-step inquiry into a one-step inquiry, leading to bizarre results and legal uncertainty. This Note examines why the Mayo framework should never have been extended to abstract ideas in Alice, and proposes a solution to determine patent eligibility under 35 U.S.C. § 101.

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INTRODUCTION

Is a camera an abstract idea? Does a camera merely “exist[] in thought or as an idea [while] not having a physical or concrete existence?”¹ That would seem an odd way to define an object with a defined shape that can be held in your hand and can give you a concussion if it is thrown at your head. Abstract ideas, on the whole, are concussion-proof.

A separate but related inquiry: is a process for manufacturing automobile driveshafts a law of nature? A few examples of laws of nature include Newton’s law of gravity, the ideal gas law, and the law of supply and demand.² These are laws of nature because they describe “an observable law relating to natural phenomena.”³ Essentially, they are laws of nature because they are “statements of the uniformities or regularities of the world” and because “the natural world ‘obeys’” them.⁴ So, is a purportedly better way to manufacture a car part really a statement of the uniformity in the world? Or rather, does the process merely *observe* and provide a practical application of a law of nature?

Though these questions may seem silly and nonsensical, their answers have taken on new importance. These questions are part of a larger inquiry as to what inventions should be considered patent eligible. Because United States patents are worth \$3 trillion, determining what is eligible for a patent has a major effect on the United States economy.⁵ However, patent eligibility is mired in a state of uncertainty, as this Note will explore in detail. Many of those who follow patent jurisprudence closely hoped that the Supreme Court would resolve the lingering uncertainty by ruling on *American Axle & Manufacturing, Inc. v. Neapco Holdings LLC*,⁶ but the Court denied certiorari in June 2022,⁷ thus ending the Court’s entrance into the patent-eligibility waters for the foreseeable future.⁸

Therefore, as detailed below, cameras and automobile driveshaft manufacturing processes are now in danger of being excluded from the domain of the United States patent system. Until recently, any company or inventor

1. *Abstract*, THE NEW OXFORD AMERICAN DICTIONARY (3d ed. 2010).

2. John Carroll, *Laws of Nature*, STAN. ENCYC. OF PHIL. (Nov. 16, 2020), <https://plato.stanford.edu/entries/laws-of-nature/>.

3. *Law of Nature*, THE NEW OXFORD AMERICAN DICTIONARY (3d ed. 2010).

4. Norman Swartz, *Laws of Nature*, INTERNET ENCYC. OF PHIL., <https://iep.utm.edu/lawofnat/> (last visited Apr. 1, 2023).

5. *The High Value of U.S. Patents*, SHAREAMERICA (Apr. 1, 2022), <https://share.america.gov/high-value-of-us-patents/>.

6. *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 939 F.3d 1355 (Fed. Cir.), *aff’d in part and vacated and remanded in part on reh’g*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022). See Eileen McDermott, *Solicitor General Tells SCOTUS CAFC Got It Wrong in American Axle, Recommends Granting*, IPWATCHDOG (May 24, 2022, 6:22 PM), <https://www.ipwatchdog.com/2022/05/24/solicitor-general-tells-scotus-cafc-got-wrong-american-axle-recommends-granting/id=149248/>.

7. Blake Brittain, *U.S. Supreme Court Rejects American Axle Case on Patent Eligibility*, REUTERS (June 30, 2022, 4:45 PM), <https://www.reuters.com/legal/litigation/us-supreme-court-rejects-american-axle-case-patent-eligibility-2022-06-30>.

8. Dennis Crouch, *Supreme Court – Looking Forward 2022-2023*, PATENTLY-O (July 1, 2022), <https://patentlyo.com/patent/2022/07/supreme-looking-forward.html>.

would have thought that a camera or a manufacturing process was a slam dunk case for patent eligibility because each fall within one of the four statutory categories of inventions for patents; a camera is a machine, while a manufacturing process qualifies, unsurprisingly, as a process.⁹ Now, however, innovators cannot be so certain that any physical product or process they invent, create, or discover will be eligible for a patent.

This state of limbo affects both practicing litigators and major corporations. For practicing litigators, the course of patent litigation can, and has, become venue dependent. With no clear guidance as to what constitutes eligible subject matter, different district courts are adjudicating the patent-eligibility analysis in quite different ways. For instance, a study found that some districts are more willing to grant a Rule 12(b)(6) motion to dismiss for lack of patent eligibility: courts in California are more receptive to deciding patent eligibility at the 12(b)(6) stage, while courts in the Eastern District of Texas show a great reluctance to grant such motions.¹⁰ However, with no clarity or certainty as to what constitutes patent-eligible subject matter, parties cannot be certain that judges are properly deciding a case so early in litigation. The difference in 35 U.S.C. § 101¹¹ adjudication may be part of what drives patentees to favor certain venues over others.

Even before litigation, companies face uncertainty over whether they will be able to patent the results of their research and development efforts. As one commentator argues, “investors [are driven] away from companies developing new technologies, like artificial intelligence[,] . . . [and] companies and universities are turning from U.S. patents to other forms of protection, including trade secrets and copyright.”¹² Other commentators are concerned that this will depress “the rate of innovation because there’s not going to be the building upon other people’s inventions.”¹³ For example, Ericsson, a Sweden-based company, received a patent for a media coding invention in more than ninety countries, but “wrangle[d]” with the United States Patent and Trademark Office (USPTO) through many patent-eligibility rejections before finally receiving a patent.¹⁴ Even so, a patent examiner told Ericsson that “it was a coin flip whether the patent would survive an eligibility challenge in court.”¹⁵ Technology

9. See 35 U.S.C. § 101 (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”).

10. See Brandon Rash, Andrew Schreiber & Brooks Kenyon, *Overlooked Patent Cases: Lessons on Section 101 Motions*, AKIN GUMP (Sept. 22, 2020), <https://www.akingump.com/en/news-insights/overlooked-patent-cases-lessons-on-section-101-motions.html>.

11. § 101 is the patent-eligibility statute.

12. Matthew Bultman, *U.S. Patent Eligibility Muddle Sets It Apart from Other Countries*, BLOOMBERG L. (Nov. 12, 2021, 2:01 AM), <https://news.bloomberglaw.com/ip-law/u-s-patent-eligibility-muddle-sets-it-apart-from-other-countries>.

13. *Id.*

14. *Id.*

15. *Id.*

powerhouse IBM, which has routinely led companies in the number of United States patents received, recently stated that without change, it would “rely more on trade secret and copyright protection,” meaning that “new breakthrough ideas will be withheld from public view and other entities will be unable to learn from or improve upon them.”¹⁶

With so much uncertainty in patent-eligibility jurisprudence, this Note seeks to examine whether the current patent-eligibility framework was faulty from the beginning, and also argues for a test that will bring predictability to patent eligibility. Part I outlines the current patent-eligibility test and two recent decisions that highlight concern with the current framework. Part II examines recent Federal Circuit cases dealing with 35 U.S.C. § 101 and shows that the current patent-eligibility framework no longer works. Part III returns to the Supreme Court’s decisions in *Mayo* and *Alice* and shows that the latter’s extension of the former’s framework was a misstep that marked the beginning of the end for patent-eligibility clarity. Finally, Part IV offers the technological arts test as a possible solution to current § 101 jurisprudence.

I. THE ALICE/MAYO FRAMEWORK

In United States patent law, there are four statutory requirements for patentability: eligibility and utility under § 101, novelty under § 102, nonobviousness under § 103, and adequate disclosure and claiming under § 112.¹⁷ If a claim meets all of these requirements, then the patent is granted.¹⁸ Patent eligibility is supposed to be the easiest of these requirements to fulfill because “Congress intended statutory subject matter to ‘include anything under the sun that is made by man.’”¹⁹ Accordingly, there are four fairly uncomplicated, independent categories of inventions or discoveries eligible for patents: processes, machines, manufactures, and compositions of matter.²⁰

16. *Id.*

17. See 35 U.S.C. § 101 (providing that inventions in the enumerated categories of subject matter may receive patents “subject to the conditions and requirements of this title”). The requirements for patent eligibility will be discussed in greater detail throughout this Note.

18. A patent fulfills the utility requirement when a person of ordinary skill in the art would accept that the disclosed invention is currently capable of the claimed use. See *Patent*, LEGAL INFO. INST., <https://www.law.cornell.edu/wex/patent> (last visited Apr. 1, 2023). Though the novelty analysis is complex, in simple terms, it requires that an invention was not known or used by others in the United States, or patented or described in a printed publication in the United States or another country, one year prior to the date of the application for the patent. See *id.* A patent is considered obvious when the subject matter sought to be patented and the prior art of the patent is such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was made. See *id.* Finally, adequate disclosure and claiming requires that the patent application include a specification describing the workings of the invention, and one or more claims stating the precise legal definition of the invention. See *id.*

19. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

20. See § 101 (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”).

To help lower courts determine what inventions fall within these four independent categories, the Supreme Court developed a two-step framework to determine patent eligibility through *Mayo Collaborative Services v. Prometheus Laboratories, Inc.* and *Alice Corporation v. CLS Bank International*.²¹ According to the Court, the framework helps distinguish “patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.”²² The first step of the framework requires courts to determine whether the patent claims at issue are directed to one of the patent-ineligible categories: laws of nature, natural phenomena, and abstract ideas. If the first step reveals that the claims are directed to a patent-ineligible concept, then in step two, courts search for an “inventive concept”—an element or combination of elements that is supposed to ensure that the patent in practice amounts to significantly more than a patent upon an ineligible concept.²³ In performing the second step, courts consider the elements of each claim both individually and as an ordered combination.²⁴

Eight years after the construction of the *Alice/Mayo* framework, patent eligibility seems to be more confusing than ever. Two recent decisions from the U.S. Court of Appeals for the Federal Circuit make it apparent that the § 101 inquiry is no longer straightforward. Rather, patent eligibility is in a state of “inconsistency and unpredictability . . . [that has] destabilized technologic development in important fields of commerce.”²⁵

The first of these decisions was *American Axle & Manufacturing, Inc. v. Neapco Holdings LLC*.²⁶ In *American Axle*, the patent at issue related to a method for manufacturing driveline propshafts using liners that were designed to attenuate vibrations transmitted through a shaft assembly.²⁷ Such propshafts are used in cars to transmit rotary power in a driveline.²⁸ This manufacturing process is important and necessary, according to the inventor, to prevent bending and deflection of the shaft during manufacturing.²⁹ Even though the patent claimed a “method for manufacturing a shaft assembly,”³⁰ the Federal Circuit panel held that the claims “merely amount[ed] to an application of a natural law (Hooke’s law) to a complex system without the benefit of instructions on how

21. Throughout this Note, the patent eligibility analysis as a whole will be referred to as the *Alice/Mayo* framework. Each individual step of the analysis will be referred to as either step one or step two, depending on which step is being discussed.

22. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014).

23. *Id.*

24. *Id.*

25. *Yu v. Apple, Inc.*, 1 F.4th 1040, 1049 (Fed. Cir. 2021) (Newman, J., dissenting), *cert. denied*, 142 S. Ct. 1113 (2022).

26. 939 F.3d 1355 (Fed. Cir.), *aff’d in part and vacated and remanded in part on reh’g*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022).

27. *Id.* at 1358.

28. See *Drive Shaft*, ENERGY EDUC., https://energyeducation.ca/wiki/index.php?title=Drive_shaft&oldid=6369 (May 18, 2018).

29. *Am. Axle*, 939 F.3d at 1358.

30. U.S. Patent No. 7,774,911 col. 10, *l.* 10 (filed Aug. 17, 2010).

to do so.”³¹ In other words, the patent claims “simply stat[ed] a law of nature while adding the words ‘apply it.’”³² Never mind that law of nature in question, Hooke’s law, “is a simple approximation of a single-degree-of-freedom spring-mass system” that does not inform someone how to manufacture a driveline shaft.³³ The claims, the court found, consisted of nothing more than “a directive to use one’s knowledge of Hooke’s law, and possibly other natural laws . . . until a desired result is achieved.”³⁴ Thus, the Federal Circuit held that the claims were directed to a law of nature and therefore were not patent eligible under § 101.

The second decision was *Yu v. Apple Inc.*,³⁵ where the disputed patent claimed “a digital camera having two lenses mounted in front of separate image sensors.”³⁶ Although the camera was a “mechanical and electronic device of defined structure and mechanism,” as Judge Newman noted in her dissent,³⁷ the Federal Circuit panel held that the patent claimed an “abstract idea.”³⁸ Specifically, the court held that the patent claim was “directed to the abstract idea of taking two pictures . . . and using one picture to enhance the other in some way.”³⁹ Even though the patent was for “an improved digital camera us[ing] . . . image sensors, each with its own lens,”⁴⁰ the Federal Circuit held that the patent “simply [claimed] a generic environment in which to carry out the abstract idea.”⁴¹ Judge Newman, in her dissent, effectively articulated the concern with the majority’s decision: though the “camera of the [patent] may or may not ultimately satisfy all the substantive requirements of patentability[,] . . . that does not convert a mechanical/electronic device into an abstract idea.”⁴²

Both of these decisions brought consternation to patent practitioners and scholars throughout the country, and even to members of Congress.⁴³ Judge

31. *Am. Axle*, 939 F.3d at 1366.

32. *Id.* at 1362.

33. *Id.*

34. *Id.* at 1364.

35. 1 F.4th 1040 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 1113 (2022).

36. *Id.* at 1046 (Newman, J., dissenting).

37. *Id.*

38. *Id.* at 1043 (majority opinion).

39. *Id.*

40. U.S. Patent No. 6,611,289 col. 2, *ll.* 40–41 (filed Aug. 26, 2003).

41. *Yu*, 1 F.4th at 1043.

42. *Id.* at 1047 (Newman, J., dissenting).

43. *Contra* Vid R. Bhakar, *Litigators Take Note – Yu v. Apple Is Not Just About Subject Matter Eligibility of Patents*, NAT’L L. REV., July 9, 2021, https://www.natlawreview.com/article/litigators-take-note-yu-v-apple-not-just-about-subject-matter-eligibility-patents#google_vignette (arguing that the *Yu* patent was invalid because of the manner in which the patent was asserted in the complaint and not because of the nature of the patented invention). *See generally* Paul Michael & John Battaglia, *Federal Circuit Reflections, 2020: The Good and (Mostly) Bad*, IPWATCHDOG (Dec. 28, 2020, 4:15 PM), <https://www.ipwatchdog.com/2020/12/28/federal-circuit-reflections-2020-the-good-and-mostly-bad/id=128608/>; Brief of United States Senator Thom Tillis, Honorable Paul R. Michel & Honorable David J. Kappos as Amicus Curiae Supporting Petitioners, *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 939 F.3d 1355 (Fed. Cir. 2020) (No. 20-891); Gene Quinn, *Yu v. Apple*

Newman’s dissent warned that the majority’s holding was “contrary to the public’s interest in a stable and effective patent incentive.”⁴⁴ Chief Judge Moore, in her dissent in *American Axle*, commented that the § 101 “hydra has grown another head.”⁴⁵ These decisions show that the *Alice/Mayo* framework is difficult to apply. As the next Part explores, the Federal Circuit’s recent decisions have collapsed the *Alice/Mayo* framework from a two-step inquiry to a one-step inquiry, leading to much uncertainty and confusion over how to properly implement the framework.

II. RECENT 35 U.S.C. § 101 DECISIONS

While the Supreme Court may have hoped that the Federal Circuit would develop its *Alice/Mayo* framework into a clear and predictable test for patent eligibility,⁴⁶ recent Federal Circuit cases demonstrate that the framework has become anything but.⁴⁷ Patent litigators and scholars cannot be certain how to apply each step, and the outcomes between cases are inconsistent. There are two different ways that the *Alice/Mayo* framework is creating havoc. First, the two-step framework is “collapsing” into one step, with the Federal Circuit using step-two analysis to determine if patent claims fall within the ambit of step one. Second, patents that have similar types of claims are not being held to the same patent-eligibility standards, leading to major discrepancies from case to case.

A. “COLLAPSING” CASES

When the Supreme Court constructed the two-step framework in *Mayo* and *Alice*, each step was supposed to be distinct.⁴⁸ First, a court determines if a claim is directed to a patent-ineligible concept. If, and only if, the answer to that inquiry is yes, the court is supposed to look at whether there is an inventive concept.⁴⁹ For an inventive concept to provide patent eligibility, it “must do

Settles It: The CAFC Is Suffering from a Prolonged Version of Alice in Wonderland Syndrome, IPWATCHDOG (June 20, 2021, 12:15 PM), <https://www.ipwatchdog.com/2021/06/20/you-v-apple-settles-cafc-suffering-prolonged-version-alice-wonderland-syndrome/id=134765/>.

44. *Yu*, 1 F.4th at 1049 (Newman, J., dissenting).

45. *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 939 F.3d 1355 (Fed. Cir.) (Moore, C.J., dissenting), *aff’d in part and vacated and remanded in part on reh’g*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022).

46. Transcript of Oral Argument at 28, *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014) (No. 13-298) (“And what I suspect, in my opinion, *Mayo* did and *Bilski* and the other cases is sketch an outer shell of the content [of patent eligibility], hoping that the experts, you and the other lawyers and the – the circuit court, could fill in a little better than we had done the content of that shell.”).

47. *See infra* Part II.

48. *See Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217–18 (2014).

49. *See CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1368 (Fed. Cir. 2020) (“If the claims are not directed to a patent-ineligible concept under *Alice* step 1, ‘the claims satisfy § 101 and [the court] need not proceed to the second step.’” (quoting *Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999, 1007 (Fed. Cir. 2018))), *cert. denied*, 141 S. Ct. 1266 (2021).

more than simply recite ‘well-understood, routine, conventional activity.’”⁵⁰ However, as discussed below, recent Federal Circuit cases show that these distinct steps are collapsing into one step because courts look to see what is “conventional” or “well-understood” in the field to determine if a claim is directed to a patent-ineligible concept.

An example of the collapse of the *Alice/Mayo* framework is *Universal Secure Registry v. Apple* (“*USR*”),⁵¹ where one of the four patents at issue was directed to securing electronic payment transactions by using an “identification system” that would allow a user to be identified without needing to provide any personal information.⁵² Though the patented claims could be used in several sectors, one embodiment disclosed in the patent was for purchasing goods or services without revealing personal financial information to the merchant.⁵³ When making a purchase, a user would enter a secret code into their electronic device (such as a phone or smartwatch), and the device would then generate a one-time code that the user would give to the merchant.⁵⁴ The merchant would transmit this code, along with other information to the credit card company, which would then ask the “system” to verify that the code was accurate.⁵⁵ If it was an accurate code, the system would send the card information to the credit card company, and the purchase could be completed.⁵⁶ The system was purportedly a more secure authentication system than what existed previously.

In its *Alice* analysis, the Federal Circuit began the step-one inquiry, which asks whether the claim is directed to a patent-ineligible concept (such as an abstract idea), by stating that “[i]n cases involving authentication technology, patent eligibility often turns on whether the claims provide sufficient specificity to constitute an improvement to computer functionality itself.”⁵⁷ The Federal Circuit cited three of its previous decisions, each dealing with authentication technology, where at *Alice* step one the court examined whether “the claims recited generic steps typical of [the] conventional process” at issue to determine if an “abstract idea” was claimed.⁵⁸ Using these precedents as guidance, the court

50. *Universal Secure Registry LLC v. Apple Inc.*, 10 F.4th 1342, 1346 (Fed. Cir. 2021) (citing *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 79–80 (2012)), *cert. denied*, 142 S. Ct. 2707 (2022).

51. *Id.*

52. *Id.* at 1345.

53. See U.S. Patent No. 8,856,539 col. 11, *l.* 46–col. 12, *l.* 18 (filed Oct. 7, 2014).

54. *Universal Secure Registry*, 10 F.4th at 1348.

55. *Id.*

56. *Id.*

57. *Id.* at 1346.

58. *Id.* at 1346–47; see *Prism Techs. LLC v. T-Mobile USA, Inc.*, 696 F. App’x 1014, 1016 (Fed. Cir. 2017) (determining that the claims were directed to an abstract idea because they “merely recited generic types of any conventional process for restricting access”); *Soultran, Inc. v. Elavon, Inc.*, 931 F.3d 1161, 1167 (Fed. Cir. 2019) (determining that the claims were directed to an abstract idea because they “were directed to a long-standing commercial practice”); *Elec. Comm’n Techs., LLC v. ShoppersChoice.com, LLC*, 958 F.3d 1178, 1182 (Fed. Cir. 2020) (determining that the claims were directed to an abstract idea because businesses have long been recording authenticating customer information).

determined that the claims at issue in *USR* were directed to a method for enabling a transaction between a user and a merchant, where the merchant was given a code instead of the credit card information.⁵⁹ The claims were directed to an abstract idea, according to the court, because they did nothing more than “simply recite *conventional* actions in a *generic* way (e.g., receiving a transaction request, verifying the identity of a customer and merchant, allowing a transaction) and [did] not purport to improve any underlying technology.”⁶⁰ Then, at *Alice* step two, the court determined that there was no inventive concept because the claimed steps were “conventional and long-standing,” and that an “abstract idea [itself] cannot serve as an inventive concept.”⁶¹ The court’s seemingly nonexistent step-two analysis is the result of having already defined the specific acts recited by the claims as abstract ideas at step one, so that there was nothing left in the claim beyond those acts that could supply an inventive concept.

The Federal Circuit’s analysis in *USR* completely collapses the *Alice/Mayo* framework. The ostensible inquiry at step one is whether the claim is directed to a fundamental principle. This is supposed to be a separate inquiry from whether the claims define an inventive application of that principle. As shown in *Mayo*, and reemphasized in *Alice*, it is not until step two that a court is supposed to determine if the patents involve “well-understood, routine, conventional activity previously engaged in” by experts in the relevant field in order to see whether the claims contain an inventive concept transforming the patent into a patent-eligible application of an abstract idea.⁶² Before proceeding to step two to look at what was previously done in the field, a court *must* first determine whether a claim is directed to one of the judicially excluded categories.⁶³ If it is not directed to a judicially excluded category, then there should be no examination of what is already known in the field. Further, this approach makes step two superfluous, as the step-two analysis becomes a duplicate of step one.⁶⁴

Another recent example of the “collapsing” framework, though one in which the court upheld the patent rather than invalidating it, is *CardioNet, LLC v. InfoBionic, Inc.*⁶⁵ There, a patent claimed an improved cardiac monitoring device that could detect the presence of atrial fibrillation or atrial flutter in a patient.⁶⁶ The system analyzed beat-to-beat timing, taking into account the variability in timing caused by irregular heartbeats, and determined if those

59. *Universal Secure Registry*, 10 F.4th at 1349.

60. *Id.* (emphasis added).

61. *Id.* at 1350.

62. *Mayo Collaborative Servs. v. Prometheus Lab’ys., Inc.*, 566 U.S. 66, 79 (2012).

63. See *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217, 221–22 (2014) (“First, [the court] determine[s] whether the claims at issue are directed to [a] patent-ineligible concept. If so, [the court] then . . . search[es] for an ‘inventive concept,’ [which includes] . . . conventional steps . . . [and what is] ‘well known in the art’ . . . (quoting *Mayo*, 566 U.S. at 79, 82–83)).

64. See *Universal Secure Registry*, 10 F.4th at 1350.

65. 955 F.3d 1358 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266.

66. *Id.* at 1364.

irregular beats were a sign of atrial fibrillation or atrial flutter, or another type of arrhythmia.⁶⁷

In step one, the Federal Circuit looked to see whether the claims focused on a “specific means or method that improves the relevant technology,” or were instead “directed to a result or effect that itself is the abstract idea and merely invokes generic processes and machinery.”⁶⁸ The court found that the patent was directed to patent-eligible subject matter, and not an abstract idea, because the “claimed invention achieve[d] multiple technological improvements.”⁶⁹ Specifically, the device was more accurate at detecting atrial fibrillation and was able to identify sustained episodes of atrial fibrillation and atrial flutter.⁷⁰ The court also relied on the fact that there was no suggestion in the written description that doctors “were ‘previously employing’ the techniques performed on the claimed device,” nor any suggestion that the claims “merely computerize[d] pre-existing techniques” for diagnosing.⁷¹ But again, the question of whether the invention employs novel techniques is not supposed to occur in step one. *Mayo* instructs that it is not until step two that a court should begin to look at what was already used in the field, and whether the purported invention simply uses conventional steps.⁷² Further, whether a claim achieves “technological improvements” can only be determined by looking at what already existed in the field, which is a step-two analysis.⁷³

The origin of this collapse in the Federal Circuit’s jurisprudence can be traced to *Enfish, LLC v. Microsoft Corp.*⁷⁴ In *Enfish*, the patents at issue claimed a “self-referential” logical model for a computer database that explained how the various elements of information were related to one another.⁷⁵ The asserted technological advance was that the claimed logical model only used one table, while previous models used multiple tables.⁷⁶ In attempting to follow the *Alice/Mayo* framework, the Federal Circuit encountered difficulties because “[t]he Supreme Court ha[d] not established a definitive rule to determine what constitutes an ‘abstract idea’ sufficient to satisfy the first step of the *Mayo/Alice* inquiry,” but had instead “found it sufficient to compare claims at issue to those already found to be” abstract ideas in previous cases to determine patent

67. *Id.*

68. *Id.* at 1368; see also *PersonalWeb Techs. LLC v. Google LLC*, 8 F.4th 1310, 1315 (Fed Cir. 2021) (using similar *CardioNet* “improvement in the relevant technology” language in evaluating the “claimed advance over the prior art” at step one to see if the claims were directed to excluded subject matter), *cert. denied*, 142 S. Ct. 1445 (2022).

69. *CardioNet*, 955 F.3d at 1368.

70. See U.S. Patent No. 7,941,207 col. 3, ll. 6–39 (issued May 20, 2011).

71. *CardioNet*, 955 F.3d at 1370.

72. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 79 (2012).

73. One might also question why “better results” are relevant at all to the patent-eligibility inquiry. After all, the patent at issue in *Mayo* supposedly improved on previous techniques as well, but the Court still found the patent to claim ineligible subject matter. See *id.* at 74, 77.

74. 822 F.3d 1327 (Fed. Cir. 2016).

75. *Id.* at 1330–34.

76. *Id.* at 1330.

eligibility.⁷⁷ Perhaps because of these difficulties, the Federal Circuit seemingly established its own version of the two-step framework, one revolving around technological improvement.⁷⁸ The court honed in on the *Alice* Court's suggestions that "claims 'purport[ing] to improve the functioning of the computer itself,' or 'improv[ing] an existing technological process' might not" be abstract ideas⁷⁹ to determine that "*Alice* [does not] broadly hold that all improvements in computer-related technology are inherently abstract, and therefore, must be considered at step-two."⁸⁰ Instead, the Federal Circuit reasoned, software could create nonabstract improvements to computer technology, and there was "no reason to conclude that all claims directed to improvements in computer-related technology . . . are abstract and necessarily analyzed at the second step of *Alice*, nor does *Alice* so direct."⁸¹ Thus, the Federal Circuit seemingly announced a new inquiry for the *Alice/Mayo* framework, at least with regard to computer systems: the relevant question, according to the court, is whether "the claims are directed to an improvement to computer functionality versus being directed to an abstract idea, even at the first step of the *Alice* analysis."⁸² The Supreme Court never had the opportunity to determine the legitimacy of this framing, as no writ of certiorari was filed. But the Federal Circuit's *Enfish* decision set precedent within the circuit,⁸³ partly leading to the two-step framework's collapse.

Frustratingly, this "collapse" is not happening in every case. In other recent decisions, the Federal Circuit has maintained that each step of the *Alice/Mayo* framework should be kept strictly separate. In 2021, the Federal Circuit, in *iLife Technologies, Inc. v. Nintendo of America, Inc.*, stated: "The conventionality of the claim elements [are] only considered at step-two if the claims are deemed at step 1 to be directed to a patent ineligible concept A claim is not directed to an abstract idea simply because it uses conventional technology."⁸⁴ Similarly, in *Illumina, Inc. v. Ariosa Diagnostics, Inc.*, the court stated that "conventionality considerations may be relevant to the inquiry under *Alice/Mayo* step-two, or to other statutory considerations such as obviousness . . . , [but] they do not impact the *Alice/Mayo* step-one question whether the claims themselves are directed to a natural phenomenon."⁸⁵ Why was the *Alice/Mayo* framework followed precisely in these cases, but not in *Enfish*, *CardioNet*, or *USR*? How

77. *Id.* at 1334.

78. *Id.* at 1335.

79. *Id.*

80. *Id.*

81. *Id.*

82. *Id.*

83. See *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1363 (Fed. Cir. 2020); *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1258 (Fed. Cir. 2017); *TecSec, Inc. v. Adobe Inc.*, 978 F.3d 1278, 1293 (Fed. Cir. 2020); *SRI Int'l, Inc. v. Cisco Sys., Inc.*, 930 F.3d 1295, 1303 (Fed. Cir. 2019) (citing to *Enfish* in performing the *Alice/Mayo* analysis).

84. 839 F. App'x 534, 537 (Fed. Cir. 2021) (emphasis added), *cert. denied*, 142 S. Ct. 109 (2021).

85. 967 F.3d 1319, 1329 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 2171 (2021).

are litigators to know whether they should argue under a collapsed framework or follow the *Alice/Mayo* framework exactly? Such discrepancy makes it seem as though the outcome of a case is dependent on the specific constitution of a panel, rather than on a faithful application of the *Alice/Mayo* test.

B. SIMILAR CASES, DIFFERENT RESULTS

The collapse of the *Alice/Mayo* framework also has an arguably more serious effect: courts have resolved cases involving similar technology differently. For instance, courts in two recent cases, each dealing with “mathematical transformations” and similar claims, applied different versions of the *Alice/Mayo* analysis. The first of these cases was *CardioNet, LLC v. InfoBionic, Inc. (CardioNet II)*.⁸⁶ This *CardioNet* case is different from the one discussed above, as the patent at issue in this case claimed an improved heart monitoring device.⁸⁷ The heart monitoring device worked by reducing the amplitude of a T-wave and increasing the amplitude of the R-wave in a heart’s electrocardiogram (“ECG”) reading, to produce more accurate ECG results.⁸⁸ At *Alice/Mayo* step one, the Federal Circuit stated that the patent claimed “the abstract idea of filtering” data, which was “only [a] basic mathematical calculation” that could not confer eligibility.⁸⁹ The patentee contended that the patents were eligible because the claims were directed beyond just a mathematical calculation since they were “tied to a ‘specific improvement’ in cardiac monitoring technology.”⁹⁰ However, the Federal Circuit dismissed this argument, noting that, to become eligible, the claims had to “be directed to a specific improvement in the computer’s functionality, not simply to use of the computer ‘as a tool’ to implement an abstract idea.”⁹¹

However, the Federal Circuit did not apply this same analysis in the second mathematical transformation case, *California Institute of Technology v. Broadcom Ltd.*⁹² The patents at issue in *California Institute* related to circuits that generated and received a certain type of error correction code designed to improve the speed and reliability of wireless data transmissions.⁹³ Because the error correction codes were linear-time encodable rather than quadratic, the relationship between the data was directly proportional and led to less needed calculations, improving data-transmission speed.⁹⁴ The defendant argued that the claims were not patent eligible because they depended on mathematical

86. Nos. 2020-2123, 2020-2150, 2021 WL 5024388 (Fed. Cir. Oct. 29, 2021).

87. *Id.* at *1; cf. *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266 (2021).

88. *CardioNet*, 2021 WL 5024388, at *1.

89. *Id.* at *3–4.

90. *Id.* at *4.

91. *Id.*

92. 25 F.4th 976, 988 (Fed. Cir. 2022), *cert. docketed*, No. 22-203 (Sept. 7, 2022).

93. *Id.* at 980–81.

94. *Id.*

operations.⁹⁵ However, the Federal Circuit quickly dismissed this argument, holding that the “mere fact that Caltech’s claim employs a mathematical formula does not demonstrate it is patent ineligible,”⁹⁶ citing supporting Supreme Court precedent.⁹⁷ The Federal Circuit went on to conclude that the patent claimed “more than a mathematical formula because it [wa]s directed to an efficient, improved method of encoding data that relie[d] in part on irregular repetition,” and thus was patent eligible.⁹⁸ Though the patent-eligibility challenge in this case was not a serious one (the patent challengers only provided cursory briefing on the issue), the case has serious ramifications for mathematical-transformation cases. Are lower courts supposed to follow the *California Institute* precedent and examine if the mathematical operation is employed in an improved process? Or should courts follow the *CardioNet II* court and find that even employing a mathematical operation in an improved process may not be enough to confer eligibility?

Another pair of cases that involved similar claims but were treated differently dealt with “authentication technology.” The first of these cases is *USR*, which, as discussed previously, involved patents directed to securing electronic payment transactions by using an “identification system” that would allow a user to be identified without needing to provide any personal information.⁹⁹ Before engaging in the *Alice/Mayo* analysis, the Federal Circuit stated that in “cases involving authentication technology, patent eligibility often turns on whether the claims provide sufficient specificity to constitute an improvement to computer functionality itself.”¹⁰⁰ Then, in its step-one analysis, the Federal Circuit held that the patent at issue claimed an abstract idea because the claims did nothing more than “simply recite *conventional* actions in a *generic* way (e.g., receiving a transaction request, verifying the identity of a customer and merchant, allowing a transaction) and [did] not purport to improve any underlying technology.”¹⁰¹

The second of these authentication technology cases is *CosmoKey Solutions GmbH & Co. KG v. Duo Security LLC*.¹⁰² In *CosmoKey*, the patent was directed to a method of “authenticating the identity of a user performing a transaction at a terminal . . . , including activating an authentication function on the user’s mobile device.”¹⁰³ The claimed advance in technology was that the authentication function was normally inactive and only activated by a user when

95. *Id.* at 988.

96. *Id.*

97. The Federal Circuit cited to *Diamond v. Diehr*, 450 U.S. 175 (1981), which held that a claim does not become patent ineligible simply because it uses a mathematical formula. *Id.* at 187.

98. *Cal. Inst.*, 25 F.4th at 988.

99. *Universal Secure Registry LLC v. Apple Inc.*, 10 F.4th 1342, 1348 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 2707 (2022).

100. *Id.* at 1346.

101. *Id.* at 1349 (emphasis added).

102. 15 F.4th 1091 (Fed. Cir. 2021).

103. *Id.* at 1093.

they turned on their phone or used a mobile application—an authentication process that seems no less “conventional” or “generic” than the process claimed in *USR*.¹⁰⁴ In its *Alice/Mayo* analysis, the Federal Circuit skipped the step-one analysis altogether, noting that even if the claims were directed to the abstract idea of authentication, the claims satisfied *Alice* step two.¹⁰⁵ The court noted that the claims and specification recited specific improvements to authentication technology, and that “nothing in the specification or anywhere else in the record support[ed] the . . . suggestion that the . . . claim steps . . . [were] conventional.”¹⁰⁶ The differences between *CosmoKey* and *USR* are significant because once the Federal Circuit categorized each patent at issue as claiming authentication technology, then the patent-eligibility inquiry should have been resolved similarly in both cases. Inquiry into other aspects of the patent, beyond whether the claims are for authentication technology, begins to move the inquiry into the other statutory requirements.

Both of these pairs of cases demonstrate that the § 101 jurisprudence is unpredictable, and possibly approaching arbitrariness. Why is it that in one mathematical transformation case, the Federal Circuit simply cited a prior Supreme Court decision to find eligibility, but in the other examined whether the claims involved something more than a computer being used or a specific way to implement the technology? And why does one authentication technology case get to a patent-eligible designation, but another does not?

As these cases demonstrate, there is a lack of cohesion, predictability, and consistency in the Federal Circuit’s patent-eligibility jurisprudence. Not only has the court collapsed the *Alice/Mayo* framework, but it has also created much uncertainty, invalidating some patents that involve the same technology held valid in others.

104. *Id.* at 1093–94.

105. *Id.* at 1097.

106. *Id.* at 1098. The Federal Circuit analyzed the specification, as well as the claims because, according to the court, the patent-eligibility analysis “must be decided on a case-by-case basis in light of the particular claim limitations, patent specification, and invention at issue.” *Id.* at 1099. Though the Supreme Court has not explicitly stated that the patent-eligibility analysis should go beyond the claims, the patent specification can be a useful source for determining the scope of the claims. *See generally* *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66 (2012); *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014). The patent specification discloses the invention to the public along with the best method of performing it, and it must enable a person of ordinary skill in the art to practice the invention. Paruli Upadhyaya, *Patent Drafting: Complete Patent Specification Elements*, SAGACIOUS IP, <https://sagaciousresearch.com/blog/complete-patent-specification/> (last visited Apr. 1, 2023). Thus, the specification as a whole provides a complete picture of the invention at issue. Elements of a patent specification include the title of the invention, the field of invention in which the subject matter falls, a background of prior art in the field of invention, a summary of the invention, a brief description of any drawings included with the patent, a detailed description of the invention, and the claims of the invention. *Id.* The claims of the invention are the most critical part of the application because they lay out the scope of protection sought. *Id.*

III. THE ALICE TWO-STEP MISSTEP

Why is this happening? What is the source of all the confusion, dysfunction, and uncertainty in § 101 jurisprudence? This Part will explore, and posit, that the uncertainty originated with the Supreme Court's original error in extending the two-step framework from *Mayo* to *Alice*.

Part of the problem lower courts are confronting is that there is no concrete or workable definition of what constitutes an “abstract idea.” The Supreme Court introduced the “abstract idea” concept into American jurisprudence in its decision in *Gottschalk v. Benson*,¹⁰⁷ when modern patent-eligibility jurisprudence began. In *Benson*, the Court first articulated a form of the judicially excluded categories of patentability that are used today: “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.”¹⁰⁸ However, when *Benson* mentioned “abstract intellectual concepts,” the Court was summarizing many years of precedent distinguishing between fundamental principles in the abstract and practical applications of those principles.¹⁰⁹ Thus, when the Supreme Court in *Bilski v. Kappos* explicitly identified “abstract ideas” as one of three excluded categories of patentability, “abstract” took on a meaning other than “not practical.”¹¹⁰

What that meaning is, the Court has never specified. In *Bilski*, the Court identified the patent at issue in the case as an abstract idea without explaining what exactly constitutes an abstract idea.¹¹¹ The Court continued to avoid defining “abstract idea” in *Alice*, its last decision on patent eligibility, simply stating: “[W]e need not labor to delimit the precise contours of the ‘abstract ideas’ category in this case.”¹¹² So, lower courts are left with the vague notion that the abstract-ideas exclusion embodies “the longstanding rule that ‘an idea of itself is not patentable.’”¹¹³ But this begs the question: What is an idea? Or less philosophically, what is an idea for purposes of patent eligibility? If courts do not know the answer, then how can they be expected to properly implement the *Alice/Mayo* framework?

Looking back at the two cases that established the patent-eligibility framework provides insight as to why the Court and lower courts have struggled with “abstract ideas.” The Supreme Court first established the framework in *Mayo* to provide a clear analytical framework for patent eligibility.¹¹⁴ The

107. *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). For a brief sketch on modern patent-eligibility jurisprudence up until *Mayo*, see Jeffrey Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565, 570–72 (2015).

108. *Benson*, 409 U.S. at 67–68.

109. See Lefstin, *supra* note 107, at 623.

110. 561 U.S. 593, 611–12 (2010).

111. See generally *id.*

112. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 221 (2014).

113. *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1367 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266.

114. See Lefstin, *supra* note 107, at 567.

patents at issue in *Mayo* related to the use of thiopurine drugs in the treatment of autoimmune diseases. When a patient ingested one of the thiopurine drugs, the blood metabolized the drug, causing metabolites to form in the bloodstream.¹¹⁵ However, the drug affected different people in different ways, making it difficult to know whether a given dose was too high (risking harmful side effects) or too low (making the dose ineffective).¹¹⁶ At the time of the patent, doctors could not figure out the precise correlation between metabolite levels and likely harm or effectiveness.¹¹⁷ The patent claims in *Mayo* set forth a process “embodying researchers’ findings that identified these correlations with some precision.”¹¹⁸

The Court grappled with two major concerns in *Mayo*. First, there was a concern that allowing a monopoly on laws of nature, part of the building blocks of discovery, would “inhibit further discovery by improperly tying up the future use of laws of nature.”¹¹⁹ Monopolization of these tools through a patent “might tend to impede innovation more than it would tend to promote it.”¹²⁰ This concern is aligned with the Constitution’s Patent Clause, whose purpose is “[t]o promote the Progress of Science and useful Arts” through the grant of patents.¹²¹ Could innovation be promoted if Albert Einstein was able to patent his famous theory of special relativity? Einstein’s famous theory is responsible for many technological advancements such as radar guns.¹²² Perhaps if Einstein was able to patent the law of nature he discovered, companies would have been unwilling to pay him the hefty license to be able to create radar guns. Or what if Isaac Newton was able to patent the law of gravity? Would someone be liable for patent infringement every time they dropped a chemical into a beaker to test a new drug? That would seem ridiculous and counterproductive to any society that wishes to have innovation drive its economy. Thus, the Court’s concern with tying up laws of nature was well founded.

The Court’s second concern in *Mayo* was extending the law of nature exclusion too far to the point of gutting patent law by excluding too many

115. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 73–74 (2012).

116. *Id.*

117. *Id.*

118. *Id.* at 74.

119. *Id.* at 86 (“[E]ven though rewarding with patents those who discover new laws of nature and the like might well encourage their discovery, those laws and principles, considered generally, are the basic tools of scientific and technological work.” (internal quotation marks omitted)); *id.* (“And so there is a danger that the grant of patents that tie up their use will inhibit future innovation premised upon them, a danger that becomes acute when a patented process amounts to no more than an instruction to ‘apply the natural law,’ or otherwise forecloses more future invention than the underlying discovery could reasonably justify.”); *id.* at 88 (“[E]ven a narrow law of nature (such as the one before us) can inhibit future research.”).

120. *Id.* at 71.

121. U.S. CONST. art. I, § 8, cl. 8.

122. See Nsikan Akpan, *TVs, Radar Guns and Other Technologies Linked to Einstein’s Theories of Relativity*, PBS NEWS HOUR (Nov. 25, 2015, 5:33 PM), <https://www.pbs.org/newshour/science/tv-radar-guns-and-other-technology-linked-to-einsteins-theories-of-relativity> (“Thanks to Einstein’s special theory of relativity and light’s immutable pace, a radar gun can make precise, almost instantaneous predictions of a vehicle’s speed, even if the cop car is moving too.”).

inventions that should be patent eligible. Early in its opinion, the Court acknowledged that “too broad an interpretation of [the § 101] exclusionary principle could eviscerate patent law.”¹²³ That is because “all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.”¹²⁴ Thus, instead of a blanket prohibition on any patent that claimed, at least in part, a law of nature, the Court determined that a process that uses a law of nature is still patent eligible as long as it has an “inventive concept” sufficient to ensure that the patent is significantly more than just a patent on the law of nature itself.¹²⁵ The Court importantly instructed that when a claimed process merely “involve[s] well-understood, routine, conventional activity previously engaged in by [experts] in the field,” there is no inventive concept.¹²⁶ The desire for an “inventive concept” advances the purpose of the Patent Clause. Taking the radar gun example, if the companies that developed the radar guns sought a patent, they could argue that while the radar gun employed Einstein’s theory, the “inventive concept” was figuring out how to convert the principles of that equation into a speeder’s great annoyance. Thus, the companies would not be tying up other innovators’ use of the theory of special relativity; they would just be tying up the theory connected with the particular configuration of the radar guns they invented.

The Court’s analysis and concerns in *Mayo* are guided by its view of the role of the other statutory requirements of patent law as compared to § 101. Again, even if an invention is patent eligible under § 101, it is only patentable if it meets the other statutory requirements of patentability: utility under § 101, novelty under § 102, nonobviousness under § 103, and adequate disclosure and claiming under § 112.¹²⁷ The government in *Mayo* argued for a relatively small role for § 101 (any step beyond a statement of a law of nature itself would satisfy § 101 requirements), arguing that the other statutory provisions would perform a “screening function” that would perform the main work of excluding unpatentable subject matter.¹²⁸ The Court rejected this argument. First, the Court said that using other statutory requirements in this manner would be inconsistent with its precedents.¹²⁹ Second, the Court said that shifting the inquiry to these sections would “creat[e] significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do”¹³⁰—an ironic concern from today’s viewpoint. Therefore, in the Court’s view, only § 101 would be able to protect laws of nature from being patented.

123. *Mayo*, 566 U.S. at 71.

124. *Id.*

125. *Id.* at 72.

126. *Id.* at 73.

127. See 35 U.S.C. § 101 (providing that inventions in the enumerated categories of subject matter may receive patents “subject to the conditions and requirements of this title”).

128. *Mayo*, 566 U.S. at 89.

129. *Id.* at 90. The Court cited its precedents *Gottschalk v. Benson*, 409 U.S. 63 (1972), *Diamond v. Diehr*, 450 U.S. 175 (1981), *Bilski v. Kappos*, 561 U.S. 593 (2010), and *Parker v. Flook*, 437 U.S. 584 (1978).

130. *Mayo*, 566 U.S. at 90.

The Court may be right about its second point. Taking the law of nature at issue in *Mayo*, it is not clear that a claim directed to a recently discovered physiological relationship would be invalid under the novelty requirement. How can a court deny the novelty of a process or relationship just discovered for the first time? Also, the relationship could not be classified as obvious, as no one in the field had been able to determine the relationship. That is, a claim based upon a newly discovered law of nature would always be novel and nonobvious, since the prior art would not disclose nor suggest the law. Finally, it seems that in cases where the law of nature is limited, like in *Mayo*, the patentee could probably enable and disclose all practical applications of the law and thus pass the § 112 inquiry.¹³¹ Therefore, if not for the law of nature exclusion under § 101, it is likely that the patent in *Mayo* would “tie up” innovation.¹³²

Two years after *Mayo*, the Court solidified the two-step framework as the determinative test of patent eligibility in *Alice*, believing it was dealing with similar concerns as it was in *Mayo*. The patent claims at issue in *Alice* related to “a computerized scheme for mitigating ‘settlement risk’”—the risk that only one party to an agreed-upon financial exchange will satisfy its obligation—“designed to facilitate the exchange of financial obligations between two parties by using a computer system as a third-party intermediary.”¹³³

Again, the Court reiterated its concern about preemption as to why laws of nature, natural phenomena, and abstract ideas are not patentable: these are the “basic tools of scientific and technological work,” and patenting them would “improperly t[ie] up the future use of these building blocks of human ingenuity.”¹³⁴ The Court also reiterated its second concern from *Mayo*: that inventions integrating “building blocks into something more” remain patent eligible, lest the exclusionary principles “swallow all of patent law.”¹³⁵

Thus, with the same concerns from *Mayo*, the Court explicitly adopted *Mayo*’s two-step framework and proceeded to analyze the patent at issue. In step one, the Court stated that the claims were “drawn to the abstract idea of

131. It may be time for the Court to revisit § 112. While the *Mayo* Court did not believe that § 112 could serve as a proper limit for patent-ineligible concepts, many of the lower courts, in deciding § 101 motions, are turning toward § 112 questions. For instance, in *Universal Secure Registry LLC v. Apple Inc.*, the Federal Circuit looked to see whether “the claims provide[d] sufficient specificity to constitute an improvement to computer functionality itself.” 10 F.4th 1342, 1346 (Fed. Cir. 2021), cert. denied, 142 S. Ct. 2707 (2022). However, whether a claim provides “sufficient specificity” is an inquiry under § 112, as the Supreme Court held in *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014) (“[W]e read § 112 to require that a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.”). Therefore, if courts are going to look for “specificity,” the Court may need to provide more guidance on what constitutes sufficient specificity.

132. It is hard to know whether many of the § 101 concerns the Court has can be prevented with § 112 since shunting everything to § 101 has stunted the development of § 112 jurisprudence. But it seems as though it would have been difficult for a patentee to draft a claim involving a practical application of special relativity in 1905 that would cover subsequent developments like radar guns, and still meet the § 112 requirements.

133. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 213 (2014).

134. *Id.* at 216.

135. *Id.* at 217.

intermediated settlement.”¹³⁶ How did the Court know that an intermediated settlement was an abstract idea? The Court looked at three of its prior cases, and in particular focused on *Bilski v. Kappos*,¹³⁷ a case where a patent claim for “a series of steps for hedging risk” was found ineligible because “hedging is a fundamental economic practice long prevalent in our system of commerce.”¹³⁸ In light of this precedent, the Court said, it was clear that the claims in *Alice* were directed to an abstract idea because the concept of intermediated settlement is also “a fundamental economic practice long prevalent in our system of commerce.”¹³⁹ The Court then cited to secondary sources that together showed that a third-party intermediary is a “clearing-house,” with one of the secondary sources explaining that clearing houses have “become a critical fixture of the financial system . . . [s]ince [their] establishment in the U.S. futures markets in 1883.”¹⁴⁰

There are two major problems with the Court’s *Alice* analysis. First, the step-one analysis shows that the Court was not even following its own two-step framework, and instead collapsed step two into step one. Determining that an intermediated settlement is an abstract idea because it is a “fundamental economic practice” that was part of the financial system since 1883 looks at whether the claims are “well-understood, routine, conventional activity, already engaged in” by experts in the field, which is supposed to be step-two analysis, according to *Mayo*.¹⁴¹

Second, the Court did not provide a clear definition for an abstract idea, and does not seem to want to give one. The petitioner in *Alice* argued that the abstract idea category should be limited to “‘preexisting, fundamental truths’ that ‘exist in principle apart from any human action.’”¹⁴² This categorization would provide lower courts with a workable definition, and one consistent with *Mayo*’s rationale. But the Court rejected it, noting that it would upend precedent since the claim in *Bilski* was “a method of organizing human activity, not a ‘truth’ about the natural world ‘that has always existed.’”¹⁴³ The Court put the final nail in the “abstract idea definition” coffin when it stated that it “need not labor to delimit the precise contours of the ‘abstract ideas’ categories . . . [because] there was no meaningful distinction between” the *Alice* claims and the *Bilski* claims.¹⁴⁴

Compare the *Alice* step-one analysis to *Mayo*’s step-one analysis, and it is apparent why claims that are categorized as “abstract ideas” are in

136. *Id.* at 218.

137. 561 U.S. 593 (2010).

138. *Id.* at 611.

139. *Alice*, 573 U.S. at 219.

140. Yesha Yadav, *The Problematic Case of Clearinghouses in Complex Markets*, 101 GEO. L.J. 387, 406 (2013).

141. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 73 (2012).

142. 573 U.S. at 220.

143. *Id.*

144. *Id.* at 221.

jurisprudential limbo. In *Mayo*, the Court said that the patents at issue “set forth laws of nature” because the relationship between the metabolites and the drug dosage “exists in principle apart from any human action.”¹⁴⁵ The Court further explained that the relation was “a consequence of the way in which thiopurine compounds are metabolized by the body—entirely natural processes.”¹⁴⁶ This step-one analysis provides a clear, principled way of determining if a patent claim can be characterized as a law of nature: if a claim is something that exists in principle apart from human activity or is entirely a natural process, then it is a law of nature.

This difference begs the question whether the *Mayo* framework for patents claiming laws of nature should even have been extended to patents supposedly claiming abstract ideas in the first place. There are important differences between *Mayo* and *Alice* that show that it likely should not have, at least as long as the Court does not provide a concrete definition of an abstract idea. The first major difference is that the patents in *Alice* probably would not have passed the other statutory requirements of patentability. If the concept of an intermediated settlement is as “fundamental” as the Court alleges, then it is unlikely that it would be able to pass the novelty requirement, as a challenger to the patent would be able to provide prior art that showed that intermediated settlement has been around since 1883. Even if the patent did meet the novelty requirement, it could not meet the nonobviousness requirement, as it is obvious to take a principle that has existed before computers existed and put it on a computer.¹⁴⁷ Thus, the Court’s concern in *Alice* that “any principle of the physical or social sciences” could be patented simply by “reciting a computer system configured to implement the relevant concept” is misguided because the other statutory requirements would ensure that these types of claims are not patented.¹⁴⁸

The second major difference is that the reasoning in *Alice* is untethered from the policy. *Alice* reiterates that § 101 is concerned with preemption and tying up future use of the building blocks of human ingenuity. In *Mayo*, this policy made sense, as the claims at issue involved a recently discovered law of nature, one that researchers had been working to discover, and something that existed apart from human ingenuity. But in *Alice*, this policy is not as clear. The *Alice* patents dealt with claims on intermediated settlements, a concept that had been around for hundreds of years and was tied to human ingenuity. The rationale seems less tied to preemption and more tied to ensuring that concepts

145. 566 U.S. at 77.

146. *Id.*

147. This is especially true in light of the Supreme Court’s decision in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007). There, the Court said that a patent is obvious when an “improvement is [nothing] more than the predictable use of prior art elements according to their established functions.” *Id.* at 417. The Court also stated that “[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one.” *Id.* Therefore, in this case, it would be predictable to take a long-existing economic principle and simply implement it on a computer. Market forces would drive a long-prevalent economic principle to be implemented onto a computer.

148. 573 U.S. at 224.

and ideas in the public domain are not unfairly tied up. However, § 101 is an unusual place to deal with these policy concerns, as §§ 102 and 103 are meant to protect the public domain. Therefore, lower courts' confusion is guaranteed because courts cannot know whether they are supposed to be concerned about preempting a newly discovered principle, or protecting ideas that already are in the public domain.

Further, it is not entirely clear why the *Alice* claims should be considered an abstract idea. The claims concerned a process done on a computer; this would seem to take them out of the “abstract” and into the “practical” because the inventors were not patenting the idea of an intermediated settlement itself, but rather its implementation on a computer. It seems as though the Court was concerned with making § 101 an all-or-nothing inquiry. Even if “an applicant could claim any principle of the physical or social sciences by reciting a computer system configured to implement the relevant concept,” this does not immediately confer patentability.¹⁴⁹ The patent must still pass the other statutory requirements. It seems as though the Court lost the patentability-requirements forest for the § 101 trees.

This misstep in *Alice* explains the two problems that district courts and the Federal Circuit face in current § 101 challenges.¹⁵⁰ First, with no clear definition of an “abstract idea,” any patent can be declared and categorized as an abstract idea if a court looks hard enough. After all, as *Mayo* stated, “all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.”¹⁵¹ This is why a court could look at the patent in *Yu*,¹⁵² a camera with a physical embodiment, and define it as “the abstract idea of taking two pictures (which may be at different exposures) and using one picture to enhance the other in some way.”¹⁵³ Or, why a court could take a process for manufacturing driveline propshafts in *American Axle* and declare that it claims Hooke's law.¹⁵⁴

The second major reason for the collapse is that the Federal Circuit and district courts are simply engaging in the same process that the Court employed in its *Alice* step-one analysis. As detailed above, the Court looked to what was “conventional” and “well-understood” to determine that the intermediated settlement was an abstract idea. The Federal Circuit uses similar language, looking at whether claims “simply recite conventional actions in a generic way”¹⁵⁵ or whether a claimed invention achieves “multiple technological

149. *Id.*

150. *See supra* Part II.

151. 566 U.S. at 71.

152. *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 1113 (2022).

153. *Id.* at 1042.

154. *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 939 F.3d 1355, 1366 (Fed. Cir. 2020), *aff'd in part and vacated and remanded in part on reh'g*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022).

155. *Universal Secure Registry v. Apple Inc.*, 10 F.4th 1342, 1349 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 2707 (2022).

improvements”¹⁵⁶ to determine whether the claims are directed to an abstract idea. Thus, lower courts seem to just be following the *Alice* Court’s misguided analysis.

IV. THE “TECHNOLOGICAL ARTS” SOLUTION

With a two-step analysis that is inconsistently applied, and a framework that should never have been extended in the first place, does § 101 need to be revamped? Many practitioners, academics, judges, and students would likely all say yes, if at least to get some sort of consistency in how patent eligibility is to be determined.¹⁵⁷ Though the Supreme Court is unlikely to update its *Alice/Mayo* framework anytime soon,¹⁵⁸ some members of Congress are considering possible changes to § 101,¹⁵⁹ and such changes may come sooner rather than later.¹⁶⁰

Any solution to patent eligibility needs to keep in mind the purposes of § 101. Part of that purpose was laid out by the *Mayo* Court when it based its two-step framework out of a concern for preemption and impeding innovation, while also ensuring that patent eligibility did not completely eviscerate patent law. However, there are three additional purposes and concerns that § 101 should address. First, § 101, and patentability in general, should be in accordance with the Constitution’s Patent Clause, which provides Congress with the authority to

156. See *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1368 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266.

157. See *supra* notes 12, 43.

158. The Supreme Court recently denied American Axle’s certiorari petition in *American Axle & Manufacturing v. Neapco Holdings LLC*, 939 F.3d 1355 (Fed. Cir. 2019), *aff’d in part and vacated and remanded in part on reh’g*, 967 F.3d 1285 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022). This seems to end the likelihood that the Court will soon revisit the *Alice/Mayo* framework and patent jurisprudence in general. See Brittain, *supra* note 7.

159. Bipartisan groups of senators have sent letters to the USPTO asking it to “request information on the current state of patent eligibility jurisprudence in the United States” and to try a pilot program that would take a “sequenced approach to patent examination.” Eileen McDermott, *USPTO Delivers on Senators’ Request for Patent Eligibility Jurisprudence Study*, IPWATCHDOG (July 8, 2021, 3:55 PM), <https://www.ipwatchdog.com/2021/07/08/uspto-delivers-senators-request-patent-eligibility-jurisprudence-study/id=135339/>. In 2019, the Senate Subcommittee on Intellectual Property held hearings on proposed revisions to § 101, but these hearings seemed to produce nothing more than a statement from Senators Tillis and Coons that the law needs to change, that the Senators are committed to changing the law, and that they are still working out some of the details. See Michael Borella, *Senator Tillis and Coons Release Statement on Recent Patent Reform Hearings*, PATENT DOCS (June 26, 2019), <https://www.patentdocs.org/2019/06/senators-tillis-and-coons-release-statement-on-recent-patent-reform-hearings.html/>.

160. Shortly after the Supreme Court denied American Axle’s petition for certiorari, Senator Thom Tillis introduced the first draft of his Patent Eligibility Restoration Act of 2022, which would, among other things, abrogate *Mayo*. See Gene Quinn, *Tillis’ Promised Patent Eligibility Bill Would Overrule Myriad, Mayo*, IP WATCHDOG (Aug. 3, 2022, 4:15 PM), <https://www.ipwatchdog.com/2022/08/03/tillis-patent-eligibility-bill-overrule-myriad-mayo/id=150586/>. Senator Tillis also promises to hold a “marathon series of hearings on patent eligibility reform” if he becomes the Intellectual Property Subcommittee Chairman in the next Congress. See Gene Quinn & Eileen McDermott, *Tillis Addresses Criticism of His Eligibility Reform Bill, Warns WD of TX Not To Backtrack on Standing Order*, IP WATCHDOG (Aug. 31, 2022, 5:15 PM), <https://www.ipwatchdog.com/2022/08/31/tillis-addresses-criticism-eligibility-reform-bill-warns-wd-tx-not-backtrack-standing-order/id=151211/#>.

promote the progress of “useful Arts.” Second, § 101 should work in concert with the other statutory requirements of patentability, not attempt to supersede them. Finally, and perhaps most importantly, § 101 jurisprudence should provide consistency and clarity to those who seek to innovate and those who seek to advocate in patent litigation.

A. THE TECHNOLOGICAL ARTS TEST

The best solution for § 101 jurisprudence does not need to be invented out of whole cloth. Instead, there is a test that has existed and been advocated in this country, and that is implemented in Europe: the “technological arts” test. Under this test, a patent is eligible if it claims an advance in science or technology (i.e., an application of scientific principles or natural laws), but ineligible if it is drawn to the application of principles outside the scientific realm such as business, law, sports, sociology, or psychology.¹⁶¹ Judge Mayer, former Chief Judge of the Federal Circuit and current senior judge on the Federal Circuit, has been the biggest proponent of the technological arts test. He first argued for the Federal Circuit to adopt the test in his dissent in the pre-*Alice* Federal Circuit decision *In re Bilski*,¹⁶² and continued calls to adopt the test post-*Alice*.¹⁶³ As his most recent opinion on patent eligibility put it, the technological arts test holds that “new machines and mechanized processes can potentially be patent eligible, [while] ideas about how to improve or influence human thought and behavior” are not patent eligible.”¹⁶⁴

The technological arts test is thoroughly established within the American legal system. First, the technological arts test accords with the Constitution’s Patent Clause. The Patent Clause gives Congress qualified authority to grant time-limited monopolies to inventors, so long as the patents “promote the Progress of . . . useful Arts.”¹⁶⁵ A number of scholars have argued that at the Founding, “useful Arts” had the equivalent meaning of “technology” or “technological arts” today.¹⁶⁶ This understanding is supported by the fact that the Founders drafted the Clause in light of the English experience with the

161. *I/P Engine, Inc. v. AOL Inc.*, 576 F. App’x. 982, 993 (Fed. Cir. 2014) (Mayer, J., concurring).

162. 545 F.3d 943, 1009–11 (Fed. Cir. 2008).

163. See *I/P Engine*, 576 F. App’x. at 992 (Mayer, J., concurring) (“*Alice* . . . for all intents and purposes, recited a ‘technological arts’ test for patent eligibility.”); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 717 (Fed. Cir. 2014) (Mayer, J., concurring) (same); *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1265 (Fed. Cir. 2014) (Mayer, J., dissenting) (same); *In re Marco Guldenaar Holding B.V.*, 911 F.3d 1157, 1166 (Fed. Cir. 2018) (Mayer, J., concurring) (same).

164. *Marco Guldenaar*, 911 F.3d at 1165 (Mayer, J., concurring).

165. U.S. CONST. art. I, § 8, cl. 8.

166. See Karl B. Lutz, *Patents and Science: A Clarification of the Patent Clause of the U.S. Constitution*, 18 GEO. WASH. L. REV. 50, 54 (1949); James S. Sfekas, *Controlling Business Method Patents: How the Japanese Standard for Patenting Software Could Bring Reasonable Limitations to Business Method Patents in the United States*, 16 PAC. RIM L. & POL’Y J. 197, 214 (2007); Alan L. Durham, “Useful Arts” in the Information Age, 1999 BYU L. REV. 1419, 1419–20; Laura R. Ford, *Alchemy and Patentability: Technology, “Useful Arts,” and the Chimerical Mind-Machine*, 42 CAL. W. L. REV. 9, 51 (2005).

Statute of Monopolies.¹⁶⁷ The Framers surely wanted to avoid “the long struggle over monopolies so prominent in English history, where exclusive rights to engage even in *ordinary business activities* were granted so frequently by the Crown.”¹⁶⁸ Therefore, rather than granting patents in the “liberal arts” or “fine arts,” the Founders wanted patents to remain within the “industrial, mechanical, and manual arts.”¹⁶⁹ Adopting a technological arts test would thus bring subject-matter eligibility within the original purpose of the Patent Clause.

The technological arts test also has support within American case law. It was first developed by the U.S. Court of Customs and Patent Appeals (“CCPA”), the predecessor to the Federal Circuit, in its decision *In re Musgrave*.¹⁷⁰ The CCPA stated that a process is patent eligible when it is “in the technological arts” because then the claim would “be in consonance with the Constitutional purpose to promote the progress of ‘useful arts.’”¹⁷¹ It further explained its version of the technological arts test in *In re Toma*,¹⁷² where it determined that “a method of operating a machine” was “in the technological arts,” and thus that a process for translating languages on a machine was patent eligible, even though a computer and translating languages were already well known.¹⁷³ Therefore, the CCPA test fashioned a broad technological arts test that excluded little from patent eligibility: even “a highly useful business method [that] would be unpatentable if done by hand” was patent eligible if it was done on a computer.¹⁷⁴ But the Federal Circuit rejected the technological arts test as the basis for patent eligibility in *In re Bilski*,¹⁷⁵ claiming that the Supreme Court had never “explicitly adopted” the test and that the term “technology” is ambiguous and ever changing.¹⁷⁶

However, the Supreme Court may have implied a technological arts test in *Alice*. Part of the reason the patent in *Alice* was ineligible, according to the Court, was that it did not “improve the functioning of the computer itself” or “effect an improvement in any other technology or technical field.”¹⁷⁷ Further, the Supreme Court in *Bilski* invited the Federal Circuit to develop a test that would

167. Durham, *supra* note 166, at 1429–30.

168. *In re Shao Wen Yuan*, 188 F.2d 377, 381 (C.C.P.A. 1951) (emphasis added).

169. See John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1164 (1999).

170. 431 F.2d 882, 893 (Ct. Cl. 1970).

171. *Id.*

172. 575 F.2d 872 (Ct. Cl. 1978).

173. *Id.* at 877–78 (“The ‘technological’ or ‘useful’ arts inquiry must focus on whether the claimed subject matter (a method of operating a machine to translate) is statutory, not on whether the product of the claimed subject matter (a translated text) is statutory, not on whether the prior art which the claimed subject matter purports to replace (translation by human mind) is statutory, and not on whether the claimed subject matter is presently perceived to be an improvement over the prior art, e.g., whether it ‘enhances’ the operation of a machine.”).

174. See *Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358, 1369 (D. Del. 1983).

175. 545 F.3d 943 (Fed. Cir. 2008).

176. *Id.* at 960.

177. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 225 (2014).

categorize business method patents and then declare them unpatentable because they claimed an abstract idea,¹⁷⁸ which the technological arts test does. Therefore, the door is open for the Federal Circuit, or the Supreme Court, to adopt the technological arts test as the standard for patentability.

B. THE TECHNOLOGICAL ARTS TEST IN EUROPE

To implement a clear and predictable technological arts test, Congress or the Court could look across the ocean, where the European Patent Office (“EPO”) has adopted its own version of the test. Under the European Patent Convention (“EPC”), “patents [are] granted for any inventions, in all fields of technology,”¹⁷⁹ though there is a non-exhaustive list of items that are not considered inventions and are thus patent ineligible: “discoveries, scientific theories and mathematical methods; aesthetic creations; schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers; [and] presentation of information.”¹⁸⁰ The EPC’s approach of explicitly defining eligibility provides more clarity and definitiveness, compared to a broad, amorphous “abstract idea” category. Thus, adopting a list similar to the EPC’s will solve one of the major issues with the *Alice* decision.¹⁸¹

An important limitation on the European excluded categories, though, is that they are only excluded to the extent that they are claimed “as such.”¹⁸² This means that if even “one technical feature” is claimed in the patent that involves one of these “non-inventions,” then the patent is considered an invention within the meaning of the EPC.¹⁸³ Therefore, the EPC has a straightforward method of determining patent eligibility: “[A] technical product/device/apparatus has technical character per se while a process or method acquires technical character by employing technical means.”¹⁸⁴ For example, if an inventor were to claim a method of doing business on a computer, then it would be an “invention,” and thus patent eligible, because a computer is “technical.” Therefore, the method employs a technical means. Essentially, for patent-eligibility purposes, everything done by a machine is considered an invention, much like the CCPA

178. *Bilski v. Kappos*, 561 U.S. 593, 608–09 (2010) (“Indeed, if the Court of Appeals were to succeed in defining a narrower category or class of patent applications that claim to instruct how business should be conducted, and then rule that the category is unpatentable because, for instance, it represents an attempt to patent abstract ideas, this conclusion might well be in accord with controlling precedent.”).

179. Convention on the Grant of European Patents art. 52, Oct. 5, 1973, 13 I.L.M. 268 [hereinafter EPC].

180. *Id.* art. 2.

181. Many of the categories in the EPC’s list have already been found to be patent ineligible by either the Supreme Court or the Federal Circuit. See *Alice*, 573 U.S. at 213; *Bilski*, 561 U.S. at 610–13; *In re Smith*, 815 F.3d 816, 818–19 (Fed. Cir. 2016).

182. EPC, *supra* note 179, at art. 2.

183. EUR. PAT. OFF., GUIDELINES FOR EXAMINATION IN THE EUROPEAN PATENT OFFICE pt. G, ch. 2, pt. 2 (2022).

184. Stefan V. Steinbrener, *Patentable Subject Matter Under Article 52(2) and (3) EPC: A Whitelist of Positive Cases from the EPO Boards of Appeal—Part 1*, 13 J. INTELL. PROP. L. & PRAC. 13, 14 (2018).

stated in *In re Toma*. This simplicity will provide more clarity and predictability to patent-eligibility jurisprudence.

But employing this method may initially contradict the Supreme Court's instruction that "one must do more than simply state [a] law of nature while adding the words 'apply it,'"¹⁸⁵ and that "mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention."¹⁸⁶ However, the European method provides an important hurdle that ensures that many of the Court's preemption concerns are not disregarded. In the second step of patentability analysis in Europe, a court considers what features "produce a technical effect or are at least linked to such an effect" and analyzes these features to determine whether these technical features are "novel and inventive."¹⁸⁷ If the technical features are not novel or inventive, then the patent is not granted. Thus, in the example above (a business method on a computer), only the computer produces the technical effect, and so only the computer would be considered for novelty and inventiveness. Since a computer is neither novel nor inventive, this invention would not be eligible for a patent. Importantly though, inquiry into whether something is novel requires looking at prior art, which means that parties need an opportunity at discovery, including questioning experts. Thus, in the U.S. context, once the technological analysis is complete, parties would have an opportunity to develop arguments, after discovery, as to why the specific technical aspect of the patent meets the requirements of the other patentability statutes.

C. THE DESIRABILITY OF THE TECHNOLOGICAL ARTS TEST

The technological arts test would not be a radical departure from analysis already employed by courts in this country.¹⁸⁸ For instance, the Supreme Court used a form of the EPO patentability analysis in its decision in *Parker v. Flook*.¹⁸⁹ The patents at issue in *Flook* described a method of updating alarm limits during a catalytic conversion process, and the Court determined that the only difference between prior art and the patent at issue was the use of a mathematical formula to determine an updated alarm-limit value.¹⁹⁰ The Court determined that the patent was "unpatentable under § 101, not because it contain[ed] a mathematical algorithm as one component, but because once that

185. *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66, 72 (2012).

186. *Alice*, 573 U.S. at 223.

187. Steinbrener, *supra* note 184, at 15. This is part of the ordinary analysis of the novelty and inventive step, not a separate hurdle for computer-implemented inventions.

188. While the technological arts test may not be a radical departure for jurisprudence, the approach *appears* to represent a radical change to the law of nonobviousness, since nontechnological features no longer contribute to the nonobviousness of the invention under the test. Section 103 may need to be statutorily amended to properly reflect the technological arts test. However, it seems as though the EPO has accomplished the technological arts test without any explicit textual basis in article 56 of the EPC, so a complete statutory overhaul may not be needed.

189. 437 U.S. 584 (1978).

190. *Id.* at 585–86.

algorithm [wa]s assumed to be within the prior art, the application, considered as a whole, contain[ed] no patentable invention.”¹⁹¹ Similar to the European approach, the Supreme Court separated out the nontechnical contributions to the patent (the mathematical formula), and looked at what was left to determine if there was an inventive application. Since there was no inventive application, no patent was allowed.

Similarly, the Federal Circuit, in many of the decisions already discussed in this Note, has utilized a technological arts test to determine patentability. For instance, in *CardioNet*,¹⁹² the patent-eligibility analysis “‘focus[ed] on a specific means or method that improves’ cardiac monitoring technology” and whether the “claimed invention achieve[d] multiple technological improvements.”¹⁹³ In *CosmoKey Solutions*,¹⁹⁴ the court found that the patent was eligible because the claims “provide[d] a technical improvement over conventional authentication methods.”¹⁹⁵ In *Yu*,¹⁹⁶ the camera was determined not to be patent eligible because it was not directed to “a specific means or method that improve[d] the relevant technology.”¹⁹⁷ Importantly, in *Enfish*, when the Federal Circuit was first trying to figure out how to define “abstract idea,” the court turned to “improvements in computer-related technology” to determine patentability.¹⁹⁸ These cases show that the Federal Circuit is attempting to fit a technological arts test within the unworkable *Alice/Mayo* framework. Instead, the Supreme Court should abandon the *Alice/Mayo* framework altogether, adopt the technological arts test, and thereby bring clarity and predictability to patent-eligibility jurisprudence.

Application of the technological arts test to prior Supreme Court and Federal Circuit cases demonstrates the clarity it will provide. For instance, the patent in *Mayo*, which essentially claimed a recently discovered correlation between a drug and the correct dosage for effectiveness, would be considered a “discovery” “as such” since it did not involve any technological component.¹⁹⁹ Since it was a discovery as such, under EPC article 52, it would not be considered an invention, and thus would not be patent eligible. The patent in *Alice*, which claimed a computerized scheme for mitigating settlement risk, would pass the patent-eligibility inquiry because the method was claimed on a computer, and thus involved a technological component. However, under the second inquiry in the technological arts test, only the computer would contribute to the technological character, and a computer is neither novel nor provides an

191. *Id.* at 594.

192. 955 F.3d 1358 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266.

193. *Id.* at 1368.

194. *CosmoKey Sols. GmbH & Co. KG v. Duo Sec. LLC*, 15 F.4th 1091 (Fed. Cir. 2021).

195. *Id.* at 1099.

196. *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 1113 (2022).

197. *Id.* at 1043.

198. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016).

199. *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66, 73–74 (2012).

inventive concept; thus, the patent would not be granted. Authentication technology cases would no longer be inconsistent. Both of the patents in *USR* and *CosmoKey* would be found to be patent eligible because both involve a technological component (a computer). As for the second step of the analysis, patentability in each case would depend on the claims and the state of the prior art, both inquiries for the other statutory requirements. However, the crucial inquiry, at least for this Note, is not whether the patents should ultimately have been granted, but whether they are patent eligible. The technological arts test simplifies and clarifies this inquiry.

Commentators have raised two major concerns with the technological arts test. The first is that it is not clear how the test would apply to new technologies.²⁰⁰ For instance, European patent examiners initially considered artificial intelligence to be ineligible.²⁰¹ Though examiners may initially be hesitant to grant patents to new technologies, these technologies will quickly be realized to be technological, and thus brought into the fold of eligibility. A few early patents may be deemed ineligible, but perhaps when it is realized that these fields are actually technological, these patents can be reexamined for eligibility.

The second concern with the technological arts test is whether “technological” can even be clearly delineated.²⁰² The EPO, for instance, has refrained from providing a definition of “technical” or “technological,” “mainly because such an attempt would be difficult and hardly [a] useful exercise.”²⁰³ Instead, the EPO uses a case-by-case approach to thoroughly outline the contours of technology.²⁰⁴ This is something that the Supreme Court and Federal Circuit can do as well. Further, the basis of what “technology” is, an application of scientific principles or natural laws, is a sufficient baseline to provide clarity to courts.

CONCLUSION

The United States patent system is a necessary good that “add[s] the fuel of interest to the fire of genius” and provides for the “discovery and production of new and useful things.”²⁰⁵ U.S. patent laws embody a “carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years.”²⁰⁶ The patent system is good and

200. Jeffrey Lefstin, Peter Menell & David Taylor, *Final Report of the Berkeley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenges*, 33 BERKELEY TECH. L.J. 551, 598–99 (2018).

201. *Id.* at 597.

202. *Id.* at 598.

203. Steinbrener, *supra* note 184, at 15.

204. *Id.*

205. Abraham Lincoln, *Second Lecture on Discoveries and Inventions*, in COLLECTED WORKS OF ABRAHAM LINCOLN 356, 363 (1953).

206. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150–51 (1989).

necessary, but it needs clarity, certainty, and predictability to optimally incentivize innovation. The *Mayo* two-step framework for patents on laws of nature should never have been extended by *Alice* to so-called “abstract ideas.” As Congress and the courts look for a solution, the technological arts test can provide the certainty and predictability that litigators, judges, and companies want and need.