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## Yu v. Apple – The Abstract Idea Conundrum: It’s Time to Either Adopt the Dictionary Definitions or Abandon the Unworkable Abstract Idea Doctrine, 56 UIC L. Rev. 301 (2023)

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**YU V. APPLE – THE ABSTRACT IDEA  
CONUNDRUM: IT’S TIME TO EITHER  
ADOPT THE DICTIONARY DEFINITIONS  
OR ABANDON THE UNWORKABLE  
ABSTRACT IDEA DOCTRINE**

RAGURAMAN KUMARESAN\*

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## I. INTRODUCTION

The United States patent system is notorious for its unpredictable standards about what is eligible for patent protection.<sup>1</sup> Imagine you invented an improved digital camera with uniquely positioned sensors and lenses that enhance the quality of images captured. You learn that patenting your invention will help you reap the full benefits of time and cost you invested in developing your camera.<sup>2</sup> You also learn that one of the key requirements to getting a patent is that the invention must be new.<sup>3</sup> You perform a prior art search<sup>4</sup> to make sure no one else in the world has published or patented a same or similar idea.<sup>5</sup> You hire a patent practitioner<sup>6</sup> to prepare and file a patent application on your behalf in the U.S. Patent and Trademark Office (“USPTO”).<sup>7</sup> A patent is then issued

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1. See Matthew Bultman, *U.S. Patent Eligibility Muddle Sets it Apart from Other Countries*, BLOOMBERG L. (Nov. 12, 2021, 4:01 AM), [news.bloomberglaw.com/ip-law/u-s-patent-eligibility-muddle-sets-it-apart-from-other-countries](https://www.bloomberglaw.com/ip-law/u-s-patent-eligibility-muddle-sets-it-apart-from-other-countries) [perma.cc/CYA3-P2DJ] (stating that “major [intellectual property (IP)] jurisdictions have clear and predictable standards about what is eligible for patent protection” and that “the U.S. system involves more uncertainty and a disconnect between the patent office and courts.”).

2. See Manny W. Schechter, *Patently Confused: Understanding the Patent System*, ALM LAW (Oct. 7, 2020, 1:31 PM), [www.law.com/corpcounsel/2020/10/07/patently-confused-understanding-the-patent-system](https://www.law.com/corpcounsel/2020/10/07/patently-confused-understanding-the-patent-system) [perma.cc/5QRW-YC27] (explaining that granting patent rights “encourages inventors to invest their time and resources by enabling them to prevent others from undermining a well-earned competitive advantage.”).

3. See Vincent Chiappetta, *Patentability of Computer Software Instruction as an “Article Of Manufacture”*: *Software as such as the Right Stuff*, 17 J. MARSHALL J. COMPUT. & INFO. L. 89, 99 (1998) (explaining that novelty is one of the “five key requirements” which must be met to obtain a patent in addition to subject matter eligibility, non-obviousness, usefulness, and adequate description).

4. An inventor can perform a search to ascertain their invention’s novelty prior to committing resources to file a patent application. See Ellenoff Grossman & Schole LLP, *What is a prior art search*, [www.egsllp.com/blog/what-is-a-prior-art-search](https://www.egsllp.com/blog/what-is-a-prior-art-search) [perma.cc/YV97-UZBV] (last visited Oct. 29, 2022) (defining a prior art as “any information that is available to the public in any form prior to the filing of a patent application,” and explaining that such prior art searches “involve searching various publicly available sources to find out whether an invention has been previous described or detailed” elsewhere).

5. See Bhaven N. Sampat, *When Do Applicants Search for Prior Art?*, 53 J. L. & ECON. 399, 400 (2010) (arguing that “applicants have strong incentives to conduct searches for prior art before filing patent applications” even though they are not legally obligated to do so).

6. See 37 C.F.R. § 10.1(r)(1) (2021) (defining “Practitioner” as “an attorney or agent registered to practice before the [U.S. Patent and Trademark Office] in patent cases. . .”).

7. “The United States Patent and Trademark office (USPTO), an

with claims<sup>8</sup> describing an improved digital camera. Several years later, you notice a retailer selling a competitor’s camera with similar image enhancement functions as claimed in your patent. After further investigation, you determine that your competitor’s camera infringes your patent claim. You file an infringement action<sup>9</sup> against your competitor, but the court holds that your patent is invalid for claiming an abstract idea.<sup>10</sup> This is precisely what happened to the patentee in the 2021 Federal Circuit’s<sup>11</sup> decision in *Yu v. Apple*.<sup>12</sup> You may be wondering how a physical structure like a digital camera can be an abstract idea.<sup>13</sup> You are not alone; many experienced patent practitioners also question how a claim directed to a concrete machine—a camera—can be considered an abstract idea.<sup>14</sup>

Congress intended patentable subject matter to “include anything under the sun that is made by man.”<sup>15</sup> However, courts

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administrative body created by Congress, is responsible for granting and issuing patents.” *In Re Andrew Silver*, 540 S.W.3d 530, 532 (Tex. 2018) (citing 35 U.S.C. §§ 1(a), 2(a)(1) (2012)).

8. The claims define the scope of a patent grant. *See Markman v. Westview Instruments*, 517 U.S. 370, 373 (1996) (clarifying that the term “claim” in patent law refers to description of the subject matter which the patent applicant regards as his or her invention). “Claims are not technical descriptions of the disclosed inventions but are legal documents like the descriptions of lands by metes and bounds in a deed which define the area conveyed but do not describe the land.” *In re Vamco Mach. & Tool, Inc.*, 752 F.2d 1564, 1577 n. 5 (Fed. Cir. 1985).

9. *See Markman*, 517 U.S. at 374 (stating that a plaintiff could win an infringement suit when the court finds the patent claim as covering the alleged infringer’s product or process).

10. The term “abstract idea” or an equivalent term is not mentioned anywhere in the text of patent law. *See, e.g.*, 35 U.S.C. §§ 101, 102, 103, 112 (2022).

11. *See Court Jurisdiction*, U.S. CT. APPEALS FOR FED. CIR., [cafc.uscourts.gov/the-court/court-jurisdiction](https://cafc.uscourts.gov/the-court/court-jurisdiction) [perma.cc/YQQ8-5YAY] (last visited Oct. 29, 2022) (noting that the “U.S. Court of Appeals for the Federal Circuit [or CAFC] is unique among the thirteen circuit courts of appeals” and that it “has nationwide jurisdiction in a variety of subject areas, including . . . patents.”).

12. *See Yu v. Apple Inc.*, 1 F.4th 1040, 1041-46 (Fed. Cir. 2021) (holding a claim directed to a digital camera is a patent-ineligible abstract idea).

13. A digital camera certainly has physical components, whereas an “abstract idea” is defined in the dictionary as something that lacks concrete physical details. *See Michael Borella, What is an Abstract Idea, Anyway?*, PATENT DOCS (Mar. 1, 2020), [www.patentdocs.org/2020/03/what-is-an-abstract-idea-anyway.html](https://www.patentdocs.org/2020/03/what-is-an-abstract-idea-anyway.html) [perma.cc/UG38-AFKT] (observing that the “dictionary definition does not help” with decoding how courts apply the abstract idea during subject matter eligibility analysis).

14. *See, e.g.*, Warren Woessner, *Yu v. Apple – Transubstantiation of a Camera into an Abstract Idea*, NAT’L L. REV. (June 14, 2021), [www.natlawreview.com/article/you-v-apple-transubstantiation-camera-abstract-idea](https://www.natlawreview.com/article/you-v-apple-transubstantiation-camera-abstract-idea) [perma.cc/HK4Z-4GE9].

15. *See Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (quoting S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess.,

have carved out judicial exceptions to patentability, including subject matter concerning laws of nature,<sup>16</sup> natural phenomena,<sup>17</sup> and abstract ideas.<sup>18</sup> The latter exception addresses concerns that patenting abstract ideas might hinder the progress of science and useful arts.<sup>19</sup> Among the exceptions, courts have difficulty both defining an “abstract idea” and determining how the exception applies.<sup>20</sup>

In the 2014 decision of *Alice Corp. v. CLS Bank International*, the Supreme Court spelled out a standard for determining whether claims directed to an otherwise unpatentable abstract idea have been transformed into patent-eligible subject matter.<sup>21</sup> However, *Alice* provided no workable definition for the term “abstract idea.”<sup>22</sup> With no clear definition, patent practitioners, inventors, and applicants face a state of uncertainty.<sup>23</sup> Even the judiciary has struggled to determine if a particular claimed invention is directed

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6 (1952)).

16. The Supreme Court has explained that discoveries such as the qualities of a bacteria, the sun’s heat, electricity, or the qualities of metals are manifestations of laws of nature “free to all men and reserved exclusively to none.” *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

17. Natural Phenomena include “products that are naturally occurring or that do not have markedly different characteristics compared to what occurs in nature.” UNITED STATES DEPARTMENT OF COMMERCE – PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2106.04(b) (9th ed. Rev. 4, Oct. 2020) [hereinafter MPEP].

18. The judiciary invented the term “abstract idea” to exclude certain “abstract principles” from patentability out of fear that monopolizing these inventions would preempt all further inventions and discoveries in the field. *See, e.g., Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1345-46 (Fed. Cir. 2013) (stating that “[p]re-emption is only a subject matter eligibility problem when a claim pre-empts all practical uses of an abstract idea.”).

19. *See* MPEP § 2106.04(b) (listing the doctrinal exclusions to patent eligibility).

20. *Versata Dev. Grp., Inc. v. SAP Am., Inc.*, 793 F.3d 1306, 1331 (Fed. Cir. 2015) (noting that “there are a number of cases providing more or less guidance on how to apply” the laws of nature and natural phenomena exceptions but there is no clear guidance on how to apply the “abstract idea” exception because of the judiciary’s inability to define “abstract idea” in a way that is not itself abstract).

21. *See Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 221 (2014) (explaining that a claim that recites an abstract idea must contain “an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.”) (quoting *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 79 (2012)).

22. *See id.* (stating that the “[Court] need not labor to delimit the precise contours of the ‘abstract idea’ category.”).

23. *See Tracking the Evolving Abstract Idea Doctrine: How Courts Have Applied the Two-Part Test for Computer-Implemented Inventions post-Alice*, VENABLE (Mar. 17, 2015), [www.venable.com/insights/publications/2015/03/tracking-the-evolving-abstract-idea-doctrine-how-c](http://www.venable.com/insights/publications/2015/03/tracking-the-evolving-abstract-idea-doctrine-how-c) [perma.cc/XK2B-YVKJ] (stating that the state of uncertainty is because the Court failed to clearly define the term “abstract idea.”).

to an abstract idea.<sup>24</sup> Yet, courts have attempted to fill this uncertainty with “mathematical formulas” or “fundamental economic practice[s] long prevalent in our system of commerce” as examples of abstract ideas.<sup>25</sup> It is also not uncommon for courts to hold that certain computer-related inventions are unpatentable for implementing abstract ideas.<sup>26</sup> However, the Federal Circuit’s decision in *Yu v. Apple* indicates an inclination to expand the abstract idea doctrine to electrical and mechanical technical domains that traditionally withstood the subject matter eligibility test.<sup>27</sup> This continued expansion of what is “abstract” can potentially invalidate almost any patent claiming any electrical, mechanical, computer, or other specific purpose device with a sufficiently-defined physical structure.<sup>28</sup> The Supreme Court has emphasized the need for caution in construing exclusionary principles like the abstract idea doctrine because “all inventions . . . embody, use, reflect, rest upon, or apply . . . abstract ideas.”<sup>29</sup> *Yu v. Apple*’s expansion of the doctrine is contrary to the Court’s warning. The Federal Circuit’s approach can “swallow all of patent law” because the doctrine could be solely used to invalidate a patent while ignoring patent law’s substantive statutes concerning the

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24. See Daniel R. Cahoy, *Patently Uncertain*, 17 NW. J. TECH. & INTELL. PROP. 1, 38 (2019) (stating that “[e]ven the judiciary sees an uncertainty problem as they attempt to apply [the abstract idea doctrine] in patent cases.”).

25. *Mmodal Servs. Ltd. v. Nuance Commc’ns. Inc.*, No. 1:18-cv-00901, 2019 U.S. Dist. LEXIS 239687, at \*12 (N.D. Ga. May 13, 2019).

26. See Laurence Loumes & Mathias Robert, *Yu / Apple: the long reaching effects of the Alice decision on patent eligibility in the USA*, PLASSERAUD (July 13, 2021), [www.plass.com/en/articles/you-apple-long-reaching-effects-alice-decision-patent-eligibility-usa](http://www.plass.com/en/articles/you-apple-long-reaching-effects-alice-decision-patent-eligibility-usa) [perma.cc/LW2P-HS8A] (noting that subject matter eligibility under 35 U.S.C. § 101 became a hot topic since “the advance of computerization,” making some computer-implemented methods and devices unpatentable abstract ideas).

27. See *id.* (noting that “*Yu v. Apple* is not the first decision by the CAFC branching outside of computer implementation.”).

28. See Gene Quinn, *Yu v. Apple Settles it: The CAFC is Suffering from a Prolonged Version of Alice in Wonderland Syndrome*, IPWATCHDOG (June 20, 2021), [www.ipwatchdog.com/2021/06/20/you-v-apple-settles-cafc-suffering-prolonged-version-alice-wonderland-syndrome/id=134765/](http://www.ipwatchdog.com/2021/06/20/you-v-apple-settles-cafc-suffering-prolonged-version-alice-wonderland-syndrome/id=134765/) [perma.cc/Ry6F-W5XR] (observing that applying the currently unworkable abstract idea doctrine “would result in many hundreds of thousands of clearly tangible inventions that one can actually hold in one’s hand being mysteriously declared to be ‘abstract’ by the Federal Circuit.”).

29. See *Alice Corp.*, 573 U.S. at 217 (explaining that “an invention is not rendered ineligible for patent simply because it involves an abstract concept.”).

novelty,<sup>30</sup> non-obviousness,<sup>31</sup> utility,<sup>32</sup> enablement,<sup>33</sup> and written description<sup>34</sup> requirements.<sup>35</sup>

The purpose of the patent system is to encourage dissemination of technical knowledge by granting inventors patents for their inventions.<sup>36</sup> However, the lack of definition for the “abstract idea” doctrine and the inconsistent application of the doctrine may force inventors to abandon their inventive efforts.<sup>37</sup> This uncertainty may

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30. A claimed invention must be new to be patent-eligible. 35 U.S.C. § 102 (2022). Section 102 includes “the novelty requirement [that] call[s] for a review of the relevant ‘prior art,’ including the teachings of printed publications.” Andrew Chin, *Artful Prior Art and the Quality of DNA Patents*, 57 ALA. L. REV. 975, 991 (2006).

31. The non-obviousness requirement for patentability is defined under 35 U.S.C. § 103 and states that a patent claim can be held invalid when the prior arts independently do not anticipate the claim, but in combination would make the claimed invention obvious to a person of ordinary skill in the art. See Adam Philipp, *Federal Circuit Clarifies Combining Prior Art References*, AEONLAW (May 8, 2020), [www.aeonlaw.com/blog/2020/05/08/federal-circuit-clarifies-combining-prior-art-references/](http://www.aeonlaw.com/blog/2020/05/08/federal-circuit-clarifies-combining-prior-art-references/) [perma.cc/U37C-S3X9] (noting that “[a]n ‘obviousness’ issue can arise when an inventor combines two or more prior-art references in order to create something that’s claimed to be new.”).

32. The utility requirement states that a patent can be obtained for “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101 (2022).

33. The enablement requirement is defined under 35 U.S.C. § 112. This requirement “rests on a two-century-old statutory foundation that in order to obtain a patent, an inventor shall deliver ‘a specification in writing . . . to enable a workman or other person skilled in the art or manufacture . . . to make, construct or use the same . . . .’” Jason Rantanen, *The Doctrinal Structure of Patent Law’s Enablement Requirement*, 69 VAND. L. REV. 1679, 1680 (2016).

34. The written description requirement is defined under 35 U.S.C. § 112. It “ensure[s] that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him; how the specification accomplishes this is not material.” Shraddha A. Upadhyaya, *THE POSTMODERN WRITTEN DESCRIPTION REQUIREMENT: An Analysis of the Application of the Heightened Written Description Requirement to Original Claims*, 4 MINN. INTELL. PROP. REV. 65, 81 (2002). This is separate from the enablement requirement. *Id.* at 71. While the “[enablement] requirement forces the inventor to explain to the public how to make and use of his invention . . . [the written description] requirement forces the inventor to describe his invention in sufficient detail that the public understands his invention and recognizes the inventor’s contribution, and ensures that the inventor was truly in possession of the invention at the time he filed his patent application.” Jacob Adam Schroeder, *Written Description: Protecting the Quid Pro Quo Since 1793*, 21 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 63, 71-72 (2010).

35. See *Alice Corp.*, 573 U.S. at 217 (explaining the need to “tread carefully in construing this exclusionary principle lest it swallow all of patent law.”).

36. See Sean B. Seymore, *The Disclosure Function of the Patent System*, 69 VAND. L. REV. 1455, 1455 (2016) (stating that the patent system grants patent rights to inventors in exchange for full disclosure of the invention’s technical details).

37. See Ronald Zhang, *I Strongly Support the 2019 Revised Patent Subject Matter Eligibility Guidance*, [www.uspto.gov/sites/default/files/documents/eligibility2019comments\\_f\\_zhang\\_04mar2019.pdf](http://www.uspto.gov/sites/default/files/documents/eligibility2019comments_f_zhang_04mar2019.pdf) [perma.cc/R8V2-C3DD] (last

also force inventors to turn to countries with more certainty of getting patent protection than the United States.<sup>38</sup> The abstract idea doctrine's continued expansion to all technological fields will only increase the inventor population that is frustrated by the uncertainty of obtaining a patent. This, in turn, may lead to the weakening of the United States patent system. Accordingly, the judiciary must delimit the abstract idea doctrine's precise boundaries. If the judiciary cannot define the abstract idea, then it should abandon analyzing subject matter eligibility under the abstract idea doctrine. Instead, courts should rely on the substantive requirements of patentability— i.e., novelty, non-obviousness, utility, enablement, and written description—to determine a patent's validity.

Part II of this note reviews the abstract idea doctrine's lack of statutory basis and its common law development that led to the decision in *Yu v. Apple*. Part III discusses and analyzes *Yu v. Apple*, where the Federal Circuit held that a claim describing an improved camera device was an abstract idea.<sup>39</sup> Part IV proposes to eliminate the uncertainty in applying the abstract idea doctrine for determining patent-eligibility by either adopting a dictionary definition for "abstract idea" or abandoning the doctrine entirely. Part V concludes the analysis of *Yu v. Apple*.

## II. BACKGROUND

First, this section reviews the abstract idea doctrine's lack of statutory basis. Next, it examines the doctrine's common law basis by discussing key Supreme Court decisions regarding patent subject matter eligibility. Then, it explains how the Federal Circuit continued expanding the technologies affected by the abstract idea doctrine after *Alice Corp. v. CLS Bank International*. Finally, this section provides a brief factual and procedural background of the topic of this case note: *Yu v. Apple*.

### *A. Lack of Statutory Basis for the Abstract Idea Doctrine*

Congress' power to legislate on patent rights originates in the Constitution.<sup>40</sup> Article I, section 8 grants Congress the power "[to]

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visited Oct. 29, 2022) (providing an inventor's perspective of how the confusion in the definition and criteria for an abstract idea has created major uncertainty in obtaining patent protection and difficulty in commercializing inventions).

38. *Id.*

39. *See Yu*, 1 F.4th at 1041-46 (holding a claim directed to a digital camera is a patent-ineligible abstract idea).

40. *See McClurg v. Kingsland*, 42 U.S. 202, 206 (1843) (observing that there can be no limitation with respect to Congress' right to legislate or modify the laws regarding patents).



promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”<sup>41</sup> The clause’s broad terms suggest that any legislation enacted concerning patent rights need only be rationally related to the promotion of progress in science.<sup>42</sup> Consequently, Congress has plenary authority to act in the patent realm because it can create patent rights and limit to whom and upon what terms and conditions a patent can be issued.<sup>43</sup>

The Patent Act of 1790, signed into law on April 10, 1790, represented a Congressional first-attempt to codify the subject of patent rights and categories of patentable subject matter.<sup>44</sup> The Act authorized granting patents to persons who “invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used,” if “the invention or discovery [was] sufficiently useful and important.”<sup>45</sup> In other words, while Congress codified certain subject matter, such as manufacture, engine, machine, or device, as patentable so long as it was new, sufficiently useful, and important, Congress never expressly declared any particular subject matter as unpatentable.<sup>46</sup> The Patent Act of 1793 replaced the 1790 Act with slight modifications in the language.<sup>47</sup> Patents were granted to persons who had “invented any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art, machine, manufacture or composition of matter, not known or used before the application.”<sup>48</sup> The 1793 Act is notable for including “composition of matter” within the definitions of patentable subject matter.<sup>49</sup> However, it also did not identify any category of patent-ineligible subject matter.<sup>50</sup> Between 1793 and 1952, Congress passed several amendments and enacted many new

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41. U.S. CONST. art. I, § 8, cl. 8.

42. *See* *Lucree v. United States*, 117 Fed. Cl. 750, 752-54 (2014) (holding that a statute requiring patentees to pay maintenance fees three times during lives of their issued patents to keep such patents in force was rationally related to promotion of scientific progress).

43. *Giuliani v. United States*, No. 88-00287 ACK, 1988 U.S. Dist. LEXIS 13546, at \*1-2 (D. Haw. July 29, 1988).

44. *See* *Bilski v. Kappos*, 561 U.S. 593, 631-32 (2010) (observing that the constitutional clause giving Congress the power to promote the progress of useful arts was passed without objection or debate at the Constitutional Convention).

45. Patent Act of 1790, c.h. 7, § 1, 1 Stat. 109–110 (April 10, 1790).

46. *See id.* (reciting that a patent may be granted for an invention or discovery of “any useful art, manufacture, engine, machine, or device.”).

47. Patent Act of 1793, ch. 11, § 1, 1 Stat. 319 (Feb. 21, 1793).

48. *Id.*

49. *See A Brief History of the Patent Law of the United States*, LADAS & PARRY (May 07, 2022), [www.ladas.com/education-center/a-brief-history-of-the-patent-law-of-the-united-states-2/](http://www.ladas.com/education-center/a-brief-history-of-the-patent-law-of-the-united-states-2/) [perma.cc/7X2B-283E] (stating that the “definition of what constitutes patentable subject matter in the United States . . . is almost unchanged up to now.”).

50. *See* Patent Act of 1793, ch. 11, § 1, 1 Stat. 319 (Feb. 21, 1793).

patent acts, however, none of them expressly carved out any category of patent-ineligible subject matter.<sup>51</sup> In 1952, Congress enacted a new patent law requiring patentable inventions to be non-obvious,<sup>52</sup> but the definition of patentable subject matter under 35 U.S.C. § 101 (“section 101”) was left mostly unchanged.<sup>53</sup> The 1952 law defined patentable subject matter as “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.”<sup>54</sup> There has been no further change to the language of section 101 since 1952.<sup>55</sup> Accordingly, even though the judiciary has created several exceptions to patent-eligibility, including the abstract idea doctrine, Congress has still not expressly classified any category of subject matter as patent-ineligible.<sup>56</sup>

Section 101 of the patent law is so broadly written that any new and useful process, machine, manufacture, or composition of matter qualifies as patentable subject matter.<sup>57</sup> The broad language is consistent with the committee reports accompanying the 1952 Patent Act, which specifies that Congress intended patentable subject matter to “include anything under the sun that is made by man.”<sup>58</sup> Section 101 only requires that a patent claim recite one of the four subject matter categories (i.e., a process, a machine, a manufacture, or a composition of matter) to be patentable.<sup>59</sup> While section 101 does not exclude any “unpatentable” subject matter, it can be implied that anything not (1) new, (2) useful, or (3) covering

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51. Sherry Knowles & Anthony Prosser, *Unconstitutional Application of 35 U.S.C. § 101 by the U.S. Supreme Court*, 18 J. MARSHALL REV. INTELL. PROP. L. 144, 148 (2018).

52. See *Graham v. John Deere Co.*, 383 U.S. 1, 3, (1966) (stating that the test for obviousness is whether “the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.”).

53. Knowles & Prosser, *supra* note 51, at 148.

54. See *Diamond v. Diehr*, 450 U.S. 175, 181-82 (1981) (quoting 35 U.S.C. § 101 and observing that the term “process” was not added to 35 U.S.C. § 101 until 1952).

55. See Dennis Crouch, *With 102(f) Eliminated, Is Inventorship Now Codified in 35 U.S.C. 101? Maybe, but not Restrictions on Patenting Obvious Variants of Derived Information*, PATENTLYO, [www.patentlyo.com/patent/2012/10/with-102f-eliminated-is-inventorship-now-codified-in-35-usc-101.html](http://www.patentlyo.com/patent/2012/10/with-102f-eliminated-is-inventorship-now-codified-in-35-usc-101.html) [perma.cc/ASE4-DNSM] (last visited Oct. 29, 2022) (noting that the America Invents Act (AIA) made no changes to Section 101).

56. 35 U. S. C. § 101 (2020).

57. See *id.*

58. See Kennedy Stanley, *The Plot Thickens in the Convoluting Saga of Section 101 Patent Eligibility: Where do we go from here?*, 23 TUL. J. TECH. & INTELL. PROP. 137, 138-39 (2021) (highlighting that Congress’ broad language of 35 U.S.C. § 101 “suggest[s] a liberal interpretation of patent eligibility.”).

59. 35 U. S. C. § 101 (2022).

one of the four subject matter categories is not patentable.<sup>60</sup> While Congress has not expressly identified any unpatentable subject matter category, three judicial exceptions could make an invention unpatentable even if it falls within one of section 101's categories.<sup>61</sup>

### *B. Development of the Common Law Basis for the Abstract Idea Doctrine*

Even though section 101 is silent about unpatentable subject matter, the judicial exceptions to patentability include laws of nature, natural phenomena, and abstract ideas.<sup>62</sup> While the terms “laws of nature,” “natural phenomena,” and “abstract ideas” have been used to describe the exceptions, “there are no bright lines” between them.<sup>63</sup> For example, courts have labeled “mathematical formulas” as both “abstract ideas” and “laws of nature.”<sup>64</sup> Courts have also used alternative terms such as “scientific principles,” “systems that depend on human intelligence alone,” “disembodied concepts,” “mental processes,” and “disembodied mathematical algorithms and formulas” to refer to the “abstract ideas” exception.<sup>65</sup> The following subsections summarize some of the cases that helped create the abstract idea doctrine.

#### *1. Development of the Abstract Idea Doctrine Before Alice*

The 1853 decision of *O'Reilly v. Morse* is one of the oldest cases addressing subject matter eligibility.<sup>66</sup> Patentee Morse was issued a patent for inventing an electro-magnetic telegraph.<sup>67</sup> The Court addressed the subject matter eligibility of one of the patent claims granted to Morse in a reissued<sup>68</sup> patent.<sup>69</sup> In the patent claim at

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60. *Id.*

61. See MPEP § 2106.04(b) (listing out the doctrinal exclusions to patent eligibility).

62. See Shahrokh Falati, *To Promote Innovation, Congress Should Abolish The Supreme Court Created Exceptions to 35 U.S. Code § 101*, 28 TEX. INTELL. PROP. L.J. 1, 22-23 (2019) (stating that the scope of the judicial exceptions has been greatly expanded recently, thus dramatically narrowing the scope of patent protection available to innovation-driven private and public enterprises, especially affecting stakeholders in the biotechnology and software-driven industries).

63. MPEP § 2106.03.

64. *Id.*

65. *Id.*

66. *O'Reilly v. Morse*, 56 U.S. 62, 69 (1853).

67. *Id.* at 86.

68. A reissue patent is a patent issued by the USPTO to correct a significant error in an already issued patent. See, e.g., Stephen G. Kunin & Kenneth M. Schor, *The Reissue Recapture Doctrine: Its Place Among the Patent Laws*, 22 CARDOZO ARTS & ENT. L.J. 451, 453 (2004) (citing 35 U.S.C. § 251 which provides a statutory basis for correction of an error in an issued patent).

69. *Morse*, 56 U.S. at 86.

issue, Morse described the use of electric current for transmitting intelligible characters at any distance without restricting the specific device or machine through which the transmission of characters was achieved.<sup>70</sup> The Court held that Morse's claim was invalid because the "art of writing at a distance by means of electromagnetism, necessarily claims all future improvements in the art."<sup>71</sup> The Court reasoned that allowing an inventor to "pirate the art" was contrary to the Constitution as such a broad claim would restrain the progress of invention.<sup>72</sup> While *Morse* did not use the term "abstract idea," legal scholars dispute whether the claim was invalidated based on an abstract idea doctrine or for failing to satisfy the enablement requirement.<sup>73</sup> Courts continue to cite *Morse* in cases addressing patent eligibility issues based on the abstract idea doctrine.<sup>74</sup>

Between 1854 and 1972, several decisions mentioned that "abstract principles" were not patentable, but defined abstract principles in the same category as the laws of nature exception, and not as a separate judicial exception.<sup>75</sup> The 1972 case of *Gottschalk v. Benson* was perhaps the first time the Court treated the "abstract idea" as its own category of exception.<sup>76</sup> The patent application at issue included a claim for a method of programming a digital computer to convert binary-coded decimal signals into pure binary form.<sup>77</sup> The Court held that mathematical algorithms or formulas were abstract ideas and, therefore, were not patentable.<sup>78</sup> It reasoned that converting decimal signals to pure binary form can be done without a computer, i.e., by using pen and paper.<sup>79</sup> The Court was concerned that the claim was so abstract that it could preempt all known and unknown uses associated with converting

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70. *Id.*

71. *Id.*

72. *See id.* 86, 134 (citing to claim eight of Morse's patents in which Morse stated that he did "not propose to limit [himself] to the specific machinery, or parts of the machinery, described in [his] specifications and claims.").

73. Adam Mossoff, *O'reilly v. Morse and Claiming a "Principle" in Antebellum Era Patent Law*, 71 CASE W. RES. L. REV. 735, 736–37 (2020).

74. *Id.*

75. *See* *Le Roy v. Tatham*, 63 U.S. 132, 137 (1860) (stating that "a patent cannot be taken out solely for an abstract philosophical principle -- for instance, for any law of nature or any property of matter, apart from any mode of turning it to account. A mere discovery of such a principle is not an invention, in the patent-law sense of the term".); *see also* Benjamin W. Hattenbach & Rosalyn M. Kautz, *Concrete Thoughts About Abstract Ideas: Why a Nebulous Exception to Patentability Should not Swallow Computer Software*, 58 SANTA CLARA L. REV. 261, 267 (2018) (explaining that the "abstract principles" in previous decisions were defined "in terms of laws of nature, not as a separate category of exceptions.").

76. *Id.*

77. *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972).

78. Harrison B. Rose, *Exploring Alice's Wonderland of Patentable Subject Matter*, 2017 U. ILL. J.L. TECH. & POL'Y, 275, 280 (2017).

79. *Benson*, 409 U.S. at 67.

binary-coded decimal to pure binary form.<sup>80</sup> While holding that one may not attempt to patent all uses of an algorithm or formula, the *Benson* Court failed to define the term “abstract idea.”<sup>81</sup> The decision is notable however, because it was the first time the Court addressed the patentability of computer-related inventions.<sup>82</sup>

In the 1978 decision of *Parker v. Flook*, the Court considered whether the patentability of a novel mathematical algorithm tied to a specific category of conventional and useful industrial processes.<sup>83</sup> The patent claim covered the use of a mathematical formula for updating alarm values in a catalytic chemical conversion process used in the petrochemical and oil-refining industries.<sup>84</sup> While both *Benson* and *Flook* focused on whether methods using a mathematical formula or algorithm were patentable, the Court distinguished *Flook* from *Benson* on the basis that *Flook* sought to claim the use of a formula in the refining industry whereas *Benson* claimed every application of the formula regardless of any particular industry.<sup>85</sup> The Court nevertheless invalidated the patent claim, holding that the chemical processes involved in the catalytic conversion were well known, and therefore not patentable, regardless of whether the processes used a novel mathematical algorithm.<sup>86</sup> *Flook* thus stands for the proposition that a process using an abstract idea like a mathematical algorithm or formula may still be patentable as long as the process itself, after removing the mathematical algorithm or formula, is novel and non-obvious.<sup>87</sup>

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80. *Id.* at 68.

81. See Maximilian R. Peterson, *Now You See It, Now You Don't: Was It a Patentable Machine or an Unpatentable "Algorithm"? On Principle and Expediency in Current Patent Law Doctrines Relating to Computer-Implemented Inventions*, 64 GEO. WASH. L. REV. 90, 104 (1995) (summarizing that “the *Benson* court held that patent protection does not extend to a claim reciting merely an algorithm (i.e., reciting no apparatus or physical limitations).”).

82. See Robert Sachs, *The Mind as Computer Metaphor: Benson and the Mistaken Application of Mental Steps to Software (Part 1)*, JDSUPRA (Apr. 17, 2016), [www.jdsupra.com/legalnews/the-mind-as-computer-metaphor-benson-38529/](http://www.jdsupra.com/legalnews/the-mind-as-computer-metaphor-benson-38529/) [perma.cc/WQ3Q-745B] (stating that “no court had invalidated claims computer-implemented inventions using the fictional form of the mental steps doctrine, that the claims ‘could be’ performed by a human.”).

83. *Parker v. Flook*, 437 U.S. 584, 585 (1978).

84. *Id.* at 585-86.

85. Nathan Peske, *CLS Bank International v. Alice Corp. Pty. at the Federal Circuit: The Dilemma Presented by Computer Implementation of Abstract Ideas and How the Supreme Court Missed a Chance to Clear It Up*, 16 MINN. J.L. SCI. & TECH. 509, 516 (2015).

86. *Flook*, 437 U.S. at 594-95 (explaining that “certain novel and useful computer programs will not promote the progress of science and the useful arts, or that such protection is undesirable as a matter of policy.”).

87. See Jeremy D. Roux, *The Supreme Court and S 101 Jurisprudence: Reconciling Subject-Matter Patentability Standards and the Abstract Idea Exception*, 2014 U. ILL. L. REV. 629, 638 (2014) (observing that the claims in *Flook* only included “well-known and conventional steps” when no consideration was given to the mathematical formula included in the claims).

While both *Benson* and *Flook* held that a claim describing a mathematical algorithm was unpatentable, the Court decided in favor of the patentee by holding that an abstract idea such as a mathematical equation *can* be patented in the 1981 decision of *Diamond v. Diehr*.<sup>88</sup>

In *Diehr*, the Court addressed the patentability of a process that included the use of a mathematical formula and a programmed digital computer.<sup>89</sup> Diehr sought patent protection for a process of curing synthetic rubber.<sup>90</sup> The claimed process involved “installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.”<sup>91</sup> The Court held that the process was patentable because it was not attempting to patent a mathematical formula, but an industrial process that transformed the article (i.e., an uncured rubber) to a different state or thing (i.e., cured rubber).<sup>92</sup> Both *Flook* and *Diehr* claimed a process that uses or applies a mathematical formula, yet the Court distinguished *Diehr* from *Flook* on the basis that *Diehr* centered on patenting the process itself, unlike *Flook* that sought to protect the underlying mathematical formula.<sup>93</sup> While the *Flook* Court was concerned that patenting a mathematical formula might preempt every application of the formula, the *Diehr* Court had no issue with validating a patent for the process itself.<sup>94</sup> The *Diehr* Court noted that the application of the formula in a specific industrial process would not preempt every use of the mathematical formula.<sup>95</sup> *Diehr* is notable in that the Court abruptly reversed course just three years after *Flook*, concluding that an industrial process incorporating an abstract idea, such as a mathematical algorithm, was indeed patentable.<sup>96</sup>

Justice Stevens, in his dissent, criticized the majority’s rationale in distinguishing *Diehr* from *Flook*.<sup>97</sup> There are clear tensions between the differing language and holdings of *Flook* and *Diehr*, as well as between *Diehr*’s majority and dissent, which is

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88. *Diehr*, 450 U.S. at 192.

89. *Id.* at 177.

90. U.S. Patent No. 4,344,142 (issued Aug. 10, 1982).

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

92. *Id.* at 192-93.

93. *Id.* at 187.

94. *See id.* at 177 (noting that “a mathematical formula, like a law of nature, cannot be the subject of a patent.”).

95. *See id.* (explaining that “industrial processes . . . for transforming raw, uncured synthetic rubber into a different state or thing are the types which have historically been eligible to receive patent-law protection.”).

96. Christopher B. Seaman & Sheena X. Wang, *An Inside History of the Burger Court’s Patent Eligibility Jurisprudence*, 53 AKRON L. REV. 915, 920 (2019).

97. *Diehr*, 450 U.S. at 215.

unsurprising given that Justice Stevens wrote *Flook's* majority opinion.<sup>98</sup> He explained that the post-solution industrial activity (i.e., setting off an alarm at the appropriate time during the catalytic conversion process) described in the *Flook* application was no less significant than the post-solution industrial process (i.e., automatically opening a curing mold) described in the *Diehr* application.<sup>99</sup> Justice Stevens also observed that the post-solution activities in both cases had no legal significance as each lacked an inventive concept, so both applications should have been held unpatentable.<sup>100</sup> *Diehr's* dissent highlights the inconsistent judicial application of the abstract idea doctrine.

*Diehr* did not bring much clarity regarding how to consistently apply the doctrine for testing subject matter eligibility of industrial processes that use or apply mathematical formulas or computer programs. However, *Diehr's* holding did illustrate when a process implementing an abstract idea can be patented. *Diehr* also stands for the proposition that the claims must be considered as a whole and that the process's novelty itself is irrelevant in patent-eligibility analysis.<sup>101</sup>

## 2. *Establishment of a New Standard in Alice for Determining Patent Subject Matter Eligibility of Claims Reciting Abstract Ideas*

Despite the obvious friction between *Diehr* and *Flook*, the Court did not consider a patentability case involving a computer-related invention under the abstract idea doctrine until *Alice Corp. v. CLS Bank International* in 2014.<sup>102</sup> In *Alice*, the Court endeavored to clarify its stance on patentability of computer-implemented inventions.<sup>103</sup> The claims at issue described using a computer system as a third-party intermediary for facilitating the exchange of financial obligations between two parties while mitigating the risk that only one party would perform the agreed-upon exchange.<sup>104</sup> The question was whether claims to computer-

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98. John M. Golden, *Cracking The Code: Ongoing Section 101 Patentability Concerns In Biotechnology And Computer Software: Essay: Flook Says One Thing, Diehr Says Another: A Need for Housecleaning in the Law of Patentable Subject Matter*, 82 GEO. WASH. L. REV. 1765, 1781-1782 (2014).

99. *Diehr*, 450 U.S. at 215.

100. *Id.*

101. *See id.* at 188-89 (noting that “[i]t is inappropriate to dissect the claims into old and new elements” when performing a subject matter eligibility analysis under section 101).

102. *See, e.g.*, Stanley, *supra* note 58, at 143 (explaining that “the case law governing patent eligibility has evolved significantly, creating what many have called an unworkable doctrine, wrought with confusion and uncertainty.”).

103. *Id.* at 146.

104. *Alice Corp.*, 573 U.S. at 212 (citing to U.S. Patent Nos. 5,970,479, 6,912,510, 7,149,720, 7,725,375). U.S. Patent 6,912,510 claimed a “method of exchanging an obligation between parties, wherein an exchange obligation is

implemented inventions were patent-eligible subject matter within the meaning of section 101 or were instead patent-ineligible abstract ideas.<sup>105</sup> In answering this question, the Court established a two-part test (“the *Alice* test”) for determining patent eligibility using the framework previously established in *Mayo v. Prometheus*.<sup>106</sup> Step one of the *Alice* test requires the Court to determine whether the claims at issue are directed at a patent-ineligible concept, i.e., laws of nature, natural phenomena, or abstract ideas.<sup>107</sup> If so, step two requires determining whether the claims contain an inventive concept sufficient to transform the patent-ineligible subject matter (like an abstract idea) into a patent-eligible application.<sup>108</sup> The Court clarified that the elements of each claim must be considered both individually and in combination to determine whether the additional elements transform the claim into a patent-eligible application.<sup>109</sup>

The Court then applied the *Alice* test to the claims at issue. Under step one, the Court concluded that the claims were drawn to the abstract idea of using a third-party intermediary to mitigate “settlement risk” in financial transactions between two parties.<sup>110</sup> It observed that the concept of intermediated settlement was no different from the risk-hedging feature the Court previously characterized as an abstract idea of a fundamental economic practice in *Bilski v. Kappos*.<sup>111</sup> While the *Alice* Court characterized the claims as an abstract idea based on a similar concept, the Court did not define an “abstract idea” and offered no guidance in applying the abstract idea exception.<sup>112</sup>

After holding that the claims were directed to an unpatentable abstract idea, the Court determined whether the claims contained an inventive concept sufficient to transform them into something

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administered by a supervisory institution, and wherein at least one credit record and one debit record is maintained with an exchange institution . . .”). U.S. Patent No. 6,912,510 (issued Jun. 28, 2005).

105. *Alice Corp.*, 573 U.S. at 212.

106. *Id.* at 217-18. In *Mayo v. Prometheus*, the Court provided a framework “in distinguishing between a claim that merely recites a patent-ineligible concept, as opposed to a potentially patentable claim that recites the application of a patent-ineligible concept.” See Christopher M. Holman, *Featuring Articles and Essays from the Center for the Protection of Intellectual Property’s Conference: The IP Platform: Supporting Invention & Inspiration: The Mayo Framework is Bad for Your Health*, 23 GEO. MASON L. REV. 901, 912-13 (2016) (stating that *Mayo* framework requires the court to search for an “inventive concept” that is sufficient to transform an otherwise patent-ineligible concept into a patent-eligible application).

107. *Alice Corp.*, 573 U.S. at 217-18.

108. *Id.* at 217.

109. *Id.*

110. *Id.* at 219.

111. *Id.* at 219-20. See also *Bilski*, 561 U.S. at 612 (agreeing unanimously that a “patent [on] risk hedging would preempt the use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.”).

112. *Alice Corp.*, 573 U.S. at 219-20.



patentable under step two.<sup>113</sup> In doing so, the Court declared that the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.<sup>114</sup> In arriving at this conclusion, the Court first looked at the claimed elements separately to hold that the computer only performed a conventional function at each step of the claimed process.<sup>115</sup> Next, it assessed the claimed elements as an ordered combination, but nevertheless concluded that the computers added nothing that was not already present when the elements were considered separately.<sup>116</sup> The Court further reasoned that the claims at issue amounted “to ‘nothing significantly more’ than” an abstract idea of “intermediated settlement using some unspecified, generic computer.”<sup>117</sup> Although the opinion did not define what “additional elements” were required to transform a claim from an abstract idea into a patent-eligible invention, *Alice* implied that a claim purporting to improve the computer’s functioning itself or improve any other technology or technical field was probably “enough.”<sup>118</sup>

### 3. *Aftermath of the Alice Decision and its Effects on Patent Examination and Litigation*

Scholars have criticized *Alice* for wasting an opportunity to develop a workable patent-eligibility test under the abstract idea doctrine.<sup>119</sup> Commentators argue that *Alice* is legally flawed because it brings novelty analysis into subject matter eligibility.<sup>120</sup> *Alice* also contradicted *Diehr*, which held that a novelty analysis is irrelevant in determining subject eligibility under section 101.<sup>121</sup> Critics reason that the *Alice* test could be used to invalidate the patent claims in *Diehr* for describing the abstract idea of a mathematical algorithm.<sup>122</sup> As a consequence, there is concern that

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113. *Id.*

114. *Id.* at 223.

115. *Id.* at 225. The notion that “in order to be patent-eligible, a claim directed to an abstract idea must contain something more than ‘routine’ or ‘conventional’ implementation steps derives from the [Supreme Court’s decision in] *Flook*.” Ted G. Dane, *Are the Federal Circuit’s Recent Section 101 Decisions a “Specific Improvement” in Patent Eligibility Law?*, 26 FED. CIR. B.J. 331, 355 (2016-2017).

116. *Alice Corp.*, 573 U.S. at 225.

117. *Id.* at 225-26 (quoting *Mayo*, 566 U.S. at 79).

118. *Id.*

119. See, e.g., Stanley, *supra* note 58, at 147-48 (highlighting that *Alice* test is “overly vague, subjective, and difficult to administer . . . leading many to characterize the test as ‘hopelessly subjective and unworkable.’”).

120. *Id.*

121. *Diehr*, 450 U.S. at 188-89 (noting that “[i]t is inappropriate to dissect the claims into old and new elements” when analyzing subject matter eligibility under section 101).

122. See Michael Borella, *Could Alice be used to Invalidate Diehr? Of Course It Could*, JDSUPRA (Apr. 21, 2021), [www.jdsupra.com/legalnews/could-alice-be-](http://www.jdsupra.com/legalnews/could-alice-be-)

the *Alice* test can be stretched to find virtually any invention unpatentable.<sup>123</sup> *Alice* therefore set forth an unworkably subjective patent eligibility analysis, causing uncertainty regarding the validity of all issued patents claiming a computer-implemented process.<sup>124</sup>

Post-*Alice*, patent litigation and the examination of patent applications involving computer-implemented inventions have dramatically changed.<sup>125</sup> It has become easier for defendants in software-patent infringement cases to seek invalidation of asserted patents based solely on the two-part *Alice* test instead of traditional patentability analysis of the novelty, non-obviousness, utility, enablement, and written description requirements.<sup>126</sup> *Alice* also increased the uncertainty of patentability of claims directed toward computer-implemented inventions.<sup>127</sup> For example, the USPTO issued a report analyzing patent examination outcomes following the decision.<sup>128</sup> The probability of software-related patent applications receiving a rejection for claiming an abstract idea increased 31% in the 18 months after *Alice* was decided.<sup>129</sup> The USPTO also highlighted the higher degree of variability in subject matter-related rejection decisions across patent examiners.<sup>130</sup> This post-*Alice* variability has caused tremendous uncertainty over what makes a patent an ineligible abstract idea.<sup>131</sup>

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used-to-invalidate-diehr-1861802/ [perma.cc/9FUL-F86A] (pointing out that “the claim of *Diehr*, when considered as an ordered combination, simply recites an abstract process performed by a generic computer, and that a series of abstract and conventional steps recited at a high level do not provide patent eligibility” in view of the two-part *Alice* test).

123. *Id.*

124. *Id.*

125. See Joseph Saltiel, *In the Courts: Five Years After Alice - Five Lessons Learned From the Treatment of Software Patents in Litigation*, WIPO MAG. (Aug. 2019), [www.wipo.int/wipo\\_magazine/en/2019/04/article\\_0006.html](http://www.wipo.int/wipo_magazine/en/2019/04/article_0006.html) [perma.cc/5WTX-D93F] (discussing the lessons learned from software patent litigation after *Alice*).

126. See *id.* (noting that “*Alice* allowed for quick resolution of litigation involving software patents of questionable validity.”).

127. See, e.g., Andrew Toole & Nicholas A. Pairolero, *Adjusting to Alice USPTO patent examination outcomes after Alice Corp. v. CLS Bank International*, USPTO OFF. CHIEF ECON. IP DATA HIGHLIGHTS NO. 3, 1, 1 (Apr. 2020), [www.uspto.gov/sites/default/files/documents/OCE-DH\\_AdjustingtoAlice.pdf](http://www.uspto.gov/sites/default/files/documents/OCE-DH_AdjustingtoAlice.pdf) [perma.cc/65YD-6GSZ].

128. *Id.*

129. Daniel Rose, *Adjusting to Alice: USPTO Report Analyzes Patent Examination Outcomes after Alice Corp. v. CLS Bank International*, NAT’L L. REV., [www.natlawreview.com/article/adjusting-to-alice-uspto-report-analyzes-patent-examination-outcomes-after-alice](http://www.natlawreview.com/article/adjusting-to-alice-uspto-report-analyzes-patent-examination-outcomes-after-alice) [perma.cc/6VA8-KBNN] (last visited Oct. 29, 2022).

130. See Toole & Pairolero, *supra* note 127, at 1 (stating that the uncertainty about patent subject matter eligibility determination in the first action stage of patent examination “increased by 26% in the 18 months following *Alice*.”).

131. See, e.g., Gene Quinn, *Alice Five Years Later: Hope Wanes as 101 Legislative Discussions Dominated by Big Tech*, IPWATCHDOG (May 5, 2019),

In January 2019, the USPTO revised its patent subject matter eligibility guidance to add clarity and structure to the examination process when implementing the *Alice* test.<sup>132</sup> The guidance explained that a claim reciting an abstract idea is patent eligible if the claim, when considered as a whole, integrates the abstract idea into a practical application.<sup>133</sup> One year after the guidance was issued, “the likelihood of *Alice*-affected technologies” (e.g., computer-implemented inventions) “receiving a first Office action with a rejection for patent-ineligible subject matter had decreased by 25%.”<sup>134</sup> The “[u]ncertainty in patent examination for *Alice*-affected technologies [also] decreased by 44%.”<sup>135</sup> While the USPTO’s revised subject matter eligibility guidance attempted to remove uncertainty in the patent examination process, the Federal Circuit eventually made clear that it was not binding on the courts.<sup>136</sup> Consequently, despite the USPTO’s attempt to provide meaningful guidance regarding patent subject matter eligibility, uncertainty regarding the application of abstract idea doctrine continues to linger.<sup>137</sup>

#### 4. *The Federal Circuit’s Continued Expansion of Technologies Affected by Abstract Idea Doctrine after the Alice decision*

The *Alice* decision emphasized the need to tread carefully in construing the abstract idea doctrine.<sup>138</sup> Despite the Supreme Court’s caution, the Federal Circuit continued to exert wide discretion by expanding the doctrine to new technological areas that, pre-*Alice*, would have otherwise escaped abstract idea

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[www.ipwatchdog.com/2019/05/05/alice-five-years-later-gearing-up-to-commemorate-thedeathof-101/id=108926/](http://www.ipwatchdog.com/2019/05/05/alice-five-years-later-gearing-up-to-commemorate-thedeathof-101/id=108926/) [perma.cc/WW7D-WACH] (noting that “[a]s the fifth anniversary of the *Alice* decision approaches, great uncertainty remains with respect to what is patent eligible in America.”).

132. See 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 50 (Jan. 7, 2019) (setting forth a revised standard for patent eligibility determination by USPTO Examiners pursuant to the *Alice* test).

133. *Id.*

134. Toole & Pairolero, *supra* note 127, at 1.

135. *Id.*

136. See *In re Rudy*, 956 F.3d 1379, 1382 (Fed. Cir. 2020) (noting that the USPTO guidance “is not, itself, the law of patent eligibility, does not carry the force of law, and is not binding on our patent eligibility analysis.”).

137. See Joseph Wolfe, *Eligibility Guidance in the Wake of Alice: Clarity at the Examiner Stage, Uncertainty in the Federal Circuit*, DLA PIPER (Dec. 22, 2020), [www.dlapiper.com/en/us/insights/publications/2020/12/ipt-news-q4-2020/eligibility-guidance-in-the-wake-of-alice/](http://www.dlapiper.com/en/us/insights/publications/2020/12/ipt-news-q4-2020/eligibility-guidance-in-the-wake-of-alice/) [perma.cc/CT62-FM74] (stating that despite the clarity provided by USPTO for “applicants at the examination stage, increased uncertainty still remains at the Federal Circuit relating to the eligibility issues.”).

138. David Taylor & John White, *Patent Eligibility Exceptions Threaten to Swallow Patent Law Whole*, 1 No. 3 MD. B.J. 136, 137 (2019).

characterization.<sup>139</sup> With this context in mind, this subsection discusses some post-*Alice* Federal Circuit cases leading to its decision in *Yu v. Apple*.

In *Chamberlain Group, Inc. v. Techtronic Industries Co.*, the Federal Circuit held that a claim to a garage door opener was a patent-ineligible abstract idea.<sup>140</sup> The patent at issue claimed a movable barrier operator (like a garage door opener) that included a transmitter for wirelessly communicating information about the movable barrier's status.<sup>141</sup> The court applied step one of the *Alice* test and determined that wirelessly communicating status information about a system was an abstract idea.<sup>142</sup> The Federal Circuit then applied step two of the *Alice* test and explained that performing wireless communication using off-the-shelf technology was not an inventive concept.<sup>143</sup> Thus, it could not transform the abstract idea of communicating status information about a system into a patent-eligible application.<sup>144</sup> In determining patent-eligibility, the *Chamberlain* court primarily focused on the novelty of the technology behind the transmission of status information rather than considering whether a garage door opener itself was an abstract idea.<sup>145</sup> Some critics reason that a claim which does not recite a mathematical concept, a certain method of organizing human activity, or a mental process cannot be an abstract idea.<sup>146</sup> Critics also argue that even if the *Chamberlain* claims were directed to an abstract idea, a conventional technology like wireless signal transmission would likely be integrated into the practical application of determining the garage door's status, i.e., whether it is open or closed.<sup>147</sup> *Chamberlain* illustrates the Federal Circuit's willingness to expand the concept of abstract idea doctrine to non-software related technologies.

In *American Axle v. Neapco*, the Federal Circuit considered patent eligibility of a method for manufacturing driveline propeller shafts designed to minimize vibrations transmitted through a shaft assembly.<sup>148</sup> Applying the *Alice* test, the court concluded under step

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139. See Sanya Sukduang et al., *2019 Patent Law Decisions of the Federal Circuit*, 69 AM. U. L. REV. 1163, 1169 (2020) (noting that “[t]he Federal Circuit continued to expand on its patentable subject matter jurisprudence under 35 U.S.C. § 101 in 2019.”).

140. *Chamberlain Grp. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1344 (Fed. Cir. 2019).

141. U.S. Patent No. 7,224,275 (issued May 29, 2007).

142. *Chamberlain Grp.*, 935 F.3d at 1346-48.

143. *Id.* at 1348-49.

144. *Id.*

145. *Id.*

146. See Cory N. Owan, *Don't Abstract Machine Learning Patents*, 61 JURIMETRICS J. 245, 260–61 (2021) (showing that the *Chamberlain* claims would have been viewed by USPTO's Examiner as patentable if the claims were to be analyzed under USPTO's 2019 patent eligibility guidance).

147. *Id.*

148. *Am. Axle & Mfg. v. Neapco Holdings LLC*, 939 F.3d 1355, 1358 (Fed.

one that the claim was directed to a law of nature (pointing to Hooke's law)<sup>149</sup> because it was missing a physical structure or steps for achieving the claimed result of vibration damping.<sup>150</sup> The Federal Circuit then applied step two and explained that achieving dampened vibrations using conventional or routine concepts was not an inventive concept, and held that claims were not patent eligible.<sup>151</sup> Judge Moore, dissenting, argued that the majority should have analyzed the missing physical structure or steps under section 112—which requires the claim to be sufficiently enabled by the specification<sup>152</sup>—not under section 101.<sup>153</sup> Critics reason that it is wholly inappropriate and unnecessary for courts to turn a section 112 enablement issue into a section 101 patent eligibility issue.<sup>154</sup> Hence, *American Axle* stands for the proposition that even claims reciting mechanical components can be held unpatentable for implementing an abstract idea.<sup>155</sup>

In *ChargePoint v. SemaConnect*, the claims at issue described electric vehicle charging stations connected to a computer network.<sup>156</sup> The claims recited interactions between several electrical components, including a control device to enable and disable electric vehicle charging, a transceiver for communicating with a remote server, and a controller to operate the control device.<sup>157</sup> Despite the presence of the structural components, the Federal Circuit held that the claims were ineligible for describing

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Cir. 2019) (citing to U.S. Patent No. 7,774,911).

149. *See id.* at 1362 (explaining that “Hooke's law is a natural law that mathematically relates the mass and/or stiffness of an object to the frequency with which that object oscillates.”).

150. *Id.* at 1361-67.

151. *Id.*

152. A patent application has several parts, including “specification [which] sets forth a detailed description of the invention.” Jeremy W. Bock, *Behavioral Claim Construction*, 102 MINN. L. REV. 1273, 1278 (2018). Courts have used “the specification [as] the primary source for determining what was invented and what is covered by the claims.” *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1381 (Fed. Cir. 2011).

153. *Am. Axle & Mfg.*, 939 F.3d at 1368-69 (noting that the “majority’s decision expands § 101 well beyond its statutory gate-keeping function.”).

154. Dominic Frisina, *American Axle is the Supreme Court’s Chance to Give Patent Eligibility a Tune-Up*, IPWATCHDOG (June 16, 2021), [www.ipwatchdog.com/2021/06/16/american-axle-supreme-courts-chance-give-patent-eligibility-tune/id=134648](http://www.ipwatchdog.com/2021/06/16/american-axle-supreme-courts-chance-give-patent-eligibility-tune/id=134648) [perma.cc/QK7A-PXS4].

155. *See* Dennis Crouch, *Hey Mechanical Engineers: Your Patents are also Ineligible*, PATENTLYO BLOG, [www.patentlyo.com/patent/2019/10/mechanical-engineers-ineligible.html](http://www.patentlyo.com/patent/2019/10/mechanical-engineers-ineligible.html) [perma.cc/NVW5-CVMU] (last visited Oct. 29, 2022) (stating that the Federal Circuit found the claim describing drive shafts and internal liners was broadly directed to well-known physics principles and therefore cannot help to transform the abstract idea into a patent eligible invention).

156. *See* *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 764 (Fed. Cir. 2019) (noting that “[t]here are four patents at issue in this case,” and further the four “patents share the same specification.”).

157. *See* U.S. Patent No. 8,138,715 (issued Mar. 20, 2012).

an abstract idea.<sup>158</sup> In applying step one of the *Alice* test, the court relied on the patent specification to reason that there was no improvement to the charging station from a technical perspective.<sup>159</sup> The court then explained that networking charging stations for communication was an abstract idea that would preempt the use of any networking charging stations.<sup>160</sup> Under step two of the *Alice* test, the court again indicated that the specification did not explain how to add network connectivity to charging stations in an unconventional way.<sup>161</sup> Therefore, it did not transform the abstract idea of network communication into a patent-eligible claim.<sup>162</sup> Commentators argue that the Federal Circuit improperly applied step two of the *Alice* test by expanding its analysis from “determining if a claim transforms the nature of the claim into a patent eligible application” to determining if “the claim improve[d] the art in some unconventional way.”<sup>163</sup> Perhaps unsurprisingly, the Federal Circuit did not consider the USPTO’s 2019 patent eligibility guidance<sup>164</sup> issued after *Alice* was decided.<sup>165</sup> This is likely because, as the court later noted, while agency guidance is generally persuasive, it “is not binding” on the courts.<sup>166</sup> Thus, *Chargepoint* highlights that claims describing the interaction of several physical components can still be held patent-ineligible for describing an abstract idea.

Turning to the 2021 decision in *Yu v. Apple*, the Federal Circuit held that a claim to an improved digital camera was a patent-ineligible abstract idea.<sup>167</sup> *Yu v. Apple* is significant because the

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158. *ChargePoint, Inc.*, 920 F.3d at 775.

159. *See id.* at 767-68 (viewing the “specification as useful in understanding ‘the problem facing the inventor’ as well as what the patent describes as the invention.”).

160. *Id.*

161. *Id.*

162. *Id.* at 775.

163. *See* Russell Slifer, *The Federal Circuit Must Revisit its Imprudent Decision in Chargepoint v. SemaConnect*, IPWATCHDOG (July 14, 2019), [www.ipwatchdog.com/2019/07/14/federal-circuit-must-revisit-imprudent-decision-chargepoint-v-semaconnect/id=111278](http://www.ipwatchdog.com/2019/07/14/federal-circuit-must-revisit-imprudent-decision-chargepoint-v-semaconnect/id=111278) [perma.cc/6D5K-A6EX] (observing that the Federal Circuit ignored 35 U.S.C. §§ 102, 103 of the patent law by solely relying on patent eligibility analysis under 35 U.S.C. § 101).

164. The guidance specified that a claim reciting an abstract idea may be patent-eligible if the abstract idea “is integrated into a practical application.” 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 50 (Jan. 7, 2019).

165. *See* Garrett Tobin, *Is the U.S.P.T.O. Turning Alice Into EPC Article 52?*, 62 ARIZ. L. REV. 1121, 1147 (2020) (showing the seeming disagreement between USPTO’s 2019 patent eligibility guidance and the Federal Circuit’s decision in *Chargepoint*).

166. *See In re Rudy*, 956 F.3d at 1382 (noting that the USPTO guidance “is not, itself, the law of patent eligibility, does not carry the force of law, and is not binding in our patent eligibility analysis.”).

167. *See Yu*, 1 F.4th at 1041-46 (holding a claim directed toward a digital camera is a patent-ineligible abstract idea).

claims at issue described interaction between several physical components of a digital camera.<sup>168</sup> However, during the patent-eligibility analysis under the abstract idea doctrine, the Federal Circuit added a novelty requirement to the physical components recited in the claims.<sup>169</sup> The next subsection will provide a brief introduction to *Yu v. Apple*.

### C. Brief Introduction to *Yu v. Apple*

*Yu v. Apple* is the most recent case demonstrating the Federal Circuit's continued expansion of what qualifies as an "abstract idea." Inventors Yanbin Yu and Zhongxuan Zhang (collectively "Yu") were issued a U.S. patent titled "Digital Cameras Using Multiple Sensors with Multiple Lenses" on August 26, 2003.<sup>170</sup> Fifteen years later, Yu sued Apple and Samsung for patent infringement in the Northern District of California.<sup>171</sup> In the complaint, Yu alleged that dual-lens cameras in cell phones made by Apple and Samsung infringed their patent.<sup>172</sup> Apple and Samsung moved to dismiss the case on the basis of patent ineligibility under 35 U.S.C. § 101.<sup>173</sup> In applying step one of the *Alice* test, the district court held that the asserted claims were directed to "the abstract idea of taking two pictures and using those pictures to enhance each other in some way."<sup>174</sup> Under step two of the *Alice* test, the district court found nothing inventive about the structural elements (e.g., multiple image sensors) described in the feature and, therefore, they could not transform the abstract idea of taking and enhancing pictures into a patent-eligible invention.<sup>175</sup>

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168. See U.S. Patent No. 6,611,289 (issued Aug. 26, 2003) (claiming a digital camera with physical components like lenses, image sensors, analog-to-digital converting circuitry, and memory) [hereinafter '*'289 Patent*].

169. See Rachel L. Pearlman, *IP Frontiers: Welcome to Wonderland, Electronics Practitioners: The Expansion of Alice by Yu v. Apple*, HRFMLAW, [www.hrfmlaw.com/ip-frontiers-welcome-to-wonderland-electronics-practitioners-the-expansion-of-alice-by-yu-v-apple/](http://www.hrfmlaw.com/ip-frontiers-welcome-to-wonderland-electronics-practitioners-the-expansion-of-alice-by-yu-v-apple/) [perma.cc/RJP3-PHZG] (last visited Oct. 29, 2022) (noting that "[t]he decision in *Yu v. Apple* adds a patentability requirement to electronic devices. . .").

170. See '*'289 Patent*.

171. See *Yu*, 1 F.4th at 1041 (alleging that Apple and Samsung infringed claims 1, 2, and 4 of '*'289 Patent*).

172. *Yu v. Apple Inc.*, 392 F. Supp. 3d 1096, 1100 (N.D. Cal. 2019), *aff'd*, 1 F.4th 1040 (Fed. Cir. 2021).

173. *Id.*

174. See *id.* at 1104-06 (showing that the "complaint does not allege any facts plausibly showing that the claimed invention overcomes a problem uniquely arising in the digital context.").

175. See *id.* at 1106-07 (explaining that "[o]nce the abstract idea is removed from the claim," the remaining claimed features of a digital camera including "image sensors, lenses, circuitry, memory, and a processor" are used "in conventional ways" and "that claims are not saved from abstraction merely because" the components listed in the claims are "more specific than a generic computer. . .") (quoting *BSG Tech LLC v. Buyseasons, Inc.*, 889 F.3d 1281,

Yu then appealed to the Federal Circuit.<sup>176</sup> A divided panel affirmed the district court's decision, finding no error in its conclusion that the claims were directed to a patent-ineligible abstract idea.<sup>177</sup> Judge Newman, in her dissent, opined that a "digital camera" is a "mechanical/electronic device" that easily fits the standard subject matter eligibility criteria.<sup>178</sup> *Yu v. Apple*, as stated in Judge Newman's dissenting opinion, has brought fresh uncertainties in applying the abstract idea doctrine to patent eligibility analysis.<sup>179</sup>

The next section will provide a detailed analysis of the majority and dissenting opinions in *Yu v. Apple*.

### III. ANALYSIS

Part A of this section will analyze Judge Prost's majority opinion affirming the district court's decision that Yu's claims were directed to patent-ineligible subject matter. Part B will analyze Judge Newman's dissenting opinion, which argues that a camera, being a mechanical and electronic device of defined structure and mechanism, cannot be a patent-ineligible abstract idea.

#### *A. Analysis of Majority Opinion*

Judge Prost, joined by Judge Taranto, wrote the majority opinion affirming the district court and finding in favor of the defendants Apple Inc., Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc.<sup>180</sup> The issue before the Federal Circuit

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1286 (Fed. Cir. 2018).

176. *See Yu*, 1 F.4th at 1042.

177. *Id.* at 1043-45 (agreeing with the district court's determination that "claim 1 [was] directed to the abstract idea of taking two pictures . . . and using one picture to enhance the other in some way" and that "claim 1 [did] not include an inventive concept sufficient to transform the claimed abstract idea into a patent-eligible invention.").

178. *See id.* at 1049 (Newman, J., dissenting) (noting that the "fresh uncertainties engendered by the majority's revision of Section 101 are contrary to the statute and weight of precedent, and contrary to the public's interest in a stable and effective patent incentive.").

179. *Id.*

180. *Id.* at 1041.



was whether Claims 1,<sup>181</sup> 2,<sup>182</sup> and 4,<sup>183</sup> of US Patent No. 6,611,289 (hereinafter, referred to as “’289 patent”) issued to Yu on August 26, 2003, were patent in-eligible under section 101.<sup>184</sup> Since the district court treated Claim 1 as a representative claim for patent-eligibility purposes,<sup>185</sup> the Federal Circuit limited its patent-eligibility analysis to Claim 1 and did not separately analyze dependent Claims 2 and 4.<sup>186</sup> The Federal Circuit then employed the two-step *Alice* test to determine whether Claim 1 was patent eligible under section 101.<sup>187</sup>

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181. Claim 1 recited “[a]n improved digital camera comprising: a first and a second image sensor closely positioned with respect to a common plane, said second image sensor sensitive to a full region of visible color spectrum; two lenses, each being mounted in front of one of said two image sensors; said first image sensor producing a first image and said second image sensor producing a second image; an analog-to-digital converting circuitry coupled to said first and said second image sensor and digitizing said first and said second intensity images to produce correspondingly a first digital image and a second digital image; an image memory, coupled to said analog-to-digital converting circuitry, for storing said first digital image and said second digital image; and a digital image processor, coupled to said image memory and receiving said first digital image and said second digital image, producing a resultant digital image from said first digital image enhanced with said second digital image.” ’289 Patent, col. 10, l. 37-58 (filed Jan. 15, 1999).

182. Claim 2 recited “[t]he improved digital camera as recited in claim 1, wherein said first image sensor sensitive to said full region of visible color spectrum.” *Id.* at col. 10, l. 59-61.

183. Claim 4 recited “[t]he improved digital camera as recited in claim 1, wherein said analog-to-digital converting circuitry comprises two individual analog-to-digital converters, each integrated with one of said first and second image sensors so that said first and second digital images are digitized independently and in parallel to increase signal throughput rate.” *Id.* at col. 11, l. 1-6.

184. *See Yu*, 1 F.4th at 1043 (discussing that the Federal Circuit would “review de novo a district court’s determination of patent ineligibility under § 101.”).

185. “Courts may treat a claim as representative in certain situations, such as if the patentee does not present any meaningful argument for the distinctive significance of any claim limitations not found in the representative claim or if the parties agree to treat a claim as representative.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1365 (Fed. Cir. 2018). A finding of validity or invalidity of a representative claim (i.e., Claim 1 of Yu’s ’289 patent) will apply to the remaining asserted claims (i.e., dependent Claims 2 and 4 of Yu’s ’289 patent). *See Patricia E. Campbell, Representative Patent Claims: Their Use in Appeals to the Board and in Infringement Litigation*, 23 SANTA CLARA HIGH TECH. L.J. 55, 75 (2006) (explaining that “courts frequently rely on representative patent claims to determine the patentability of a larger group of claims” and that “[t]his practice is justified as promoting efficiency and reducing jury confusion.”).

186. *See Yu*, 1 F.4th at 1042 n.1 (observing that neither party disputes the district court’s treatment of Claim 1 as a representative claim on appeal and that “Yu [did] not separately argue the eligibility of claims 2 or 4.”).

187. *Id.* at 1043.

1. *Under Step One of the Alice test, Yu's Claim 1 was Directed to an Abstract Idea*

Step one of the *Alice* test requires the court to determine whether a patent claim is directed to an unpatentable law of nature, natural phenomenon, or abstract idea.<sup>188</sup> Applying this step, the Federal Circuit agreed with the district court that Claim 1 was directed to the abstract idea of taking two pictures and using one of the pictures to enhance the other in some way.<sup>189</sup> The majority approached step one by asking which particular feature in Yu's claim was being asserted as an advancement over the prior art.<sup>190</sup> Judge Prost analyzed Yu's Claim 1 to determine if the differences (which the court referred to as "claimed advance") between the claim and prior art was itself directed to an abstract idea.<sup>191</sup> The majority focused on the meaning of the claimed elements which Yu asserted were different from the prior art, but also considered how the claimed elements were described in the specification.<sup>192</sup> As further analyzed below, the Federal Circuit essentially agreed with the district court's analysis on Yu's Claim 1.<sup>193</sup>

The district court summarized Yu's Claim 1 as claiming a digital camera with basic components (i.e., image sensors, lenses, analog-to-digital converting circuitry, image memory, and a digital image processor) performing their basic functions, except that a final digital image was produced by enhancing a first digital image (produced by a first image sensor) using a second digital image (produced by a second image sensor).<sup>194</sup> The court stated that the idea of using multiple pictures to enhance each other has been known by photographers for over a century.<sup>195</sup> The Federal Circuit's majority also observed that Yu did not dispute this feature as being unconventional.<sup>196</sup> In its decision, the district court determined that the entire point of Yu's Claim 1 was to provide an abstract idea of two digital images so that a generic "digital image processor" could enhance one digital image using the other image.<sup>197</sup> Judge Prost agreed with the district court's interpretation of the claim language and the specification.<sup>198</sup> Prost reasoned that Yu's Claim 1 described an abstract idea of "a result or effect" achieved through generic

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188. *Alice Corp.*, 573 U.S. at 217.

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

190. *Id.*

191. *Id.*

192. *Id.*

193. *Id.*

194. *Yu v. Apple Inc.*, No. 3:18-CV-06181-JD, 2020 WL 1429773, at \*3-4 (N.D. Cal. Mar. 24, 2020), *aff'd*, 1 F.4th 1040 (Fed. Cir. 2021) (holding that the plain language of Yu's Claim 1 is directed to a patent in-eligible concept).

195. *Id.*

196. *Id.* at \*4.

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

198. *Id.*

processes and components rather than improving the relevant camera technology using a specific structure or process.<sup>199</sup> In short, the majority observed that the claimed advancement Yu asserted was an abstract idea because the idea of enhancing digital images using other images was already known.<sup>200</sup> The majority's rationale, in agreement with the district court, suggests that an abstract idea is any claimed concept which has already been widely known or used by people.<sup>201</sup>

After concluding that enhancing a digital image was a well-known idea, Judge Prost looked at the other claimed elements, namely the specific digital components recited in Claim 1 that enhanced the digital image.<sup>202</sup> Yu argued that the patent was not directed to an abstract idea because of the physical elements recited in the claim.<sup>203</sup> However, the majority agreed with the district court, finding that the claimed digital components (e.g., lenses, image sensors, analog-to-digital converting circuitry, and memory) that enhanced the digital image were themselves conventional elements performing their basic functions.<sup>204</sup> The court then held that image enhancement in a generic environment using only a camera's conventional physical components was still an abstract idea under step one of the *Alice* test.<sup>205</sup> The court's approach leads to the conclusion that reciting physical components in a claim does not help to convert an abstract idea into a patent-eligible concept when the physical components themselves are conventional and not novel.<sup>206</sup>

Yu further argued that the claimed camera architecture was a specific improvement to a technical problem, and thus, not an abstract idea.<sup>207</sup> In particular, Yu relied on the patent specification

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199. *Id.*

200. *Id.*

201. *See Yu*, 2020 WL 1429773, at \*3-5 (stating that taking two pictures and using one picture to enhance the other in some way is an abstract idea, but providing no further clarification regarding how to determine if a claimed step is an abstract idea).

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

203. *Yu*, 2020 WL 1429773, at \*3-4.

204. *See Yu*, 1 F.4th at 1043-44, n.2 (noting that while "Yu's claimed invention [was] couched as an improved machine (an 'improved digital camera') . . . [n]ot every claim that recites concrete, tangible components [would escape] the reach of the abstract-idea inquiry.>").

205. *See id.* (citing *TLI Commc'ns. LLC v. AV Auto., L.L.C. (In re TLI Commc'ns. LLC Pat. Litig.)*, 823 F.3d 607, 611 (Fed. Cir. 2016), in which the Federal Circuit held that a claim directed toward "classifying and storing digital images in an organized manner," is an abstract idea).

206. *See id.* (clarifying that the physical components recited in Yu's claim were "well-known and conventional" and that the "physical components merely provide a generic environment [for carrying out the] abstract idea of classifying and storing digital images in an organized manner.>").

207. *See* Brief for Plaintiffs-Appellants at 36-38, *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021) (Nos. 20-1760, 20-1803) (arguing that "the mere 'need for better images' [as broadly articulated by the district court] is not the problem

to explain that the '289 patent improved the functionality of digital cameras by providing a specific solution to the technical problems that image sensors suffered at the time of his invention.<sup>208</sup> The majority rejected this argument, noting that a specification full of technical details may still result in applications that claim nothing more than an abstract idea underlying those technical details.<sup>209</sup> The court further observed that the specification portions that Yu relied on to show technical improvement described a configuration different from the claimed configuration.<sup>210</sup> The court specifically noted that the specification described a four-lens, four-image-sensor configuration with three color-specific image sensors and one black-and-white image sensor, whereas the claim recited a two-lens, two-image-sensor configuration in which none of the image sensors were color-specific.<sup>211</sup> The court clarified that the mismatch between the patent specification and claimed statements only further proved that the claimed configuration did not specifically result in a technical improvement.<sup>212</sup>

Yu also asserted that the claims in the '289 patent did not preempt an abstract idea.<sup>213</sup> Courts have often conducted analysis under “preemption”<sup>214</sup> doctrine to bar overly broad claims (such as

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solved by the improved digital camera of the '289 Patent” and further noting that “the problem solved is the relatively poor image quality caused by the limited capabilities of image sensors that existed at the time of the invention.”).

208. *See id.* (quoting the specification to explain that image sensors prior to Yu’s invention suffered from technical problems (relating to the limited capabilities of image sensors that existed at the time of the invention of the '289 patent) including “low resolution caused by low pixel counts,” “inability to show vivid colors caused by limited pixel depth,” “inability to show details over a greater range due to limited photocell sensitivity,” and “with respect to the large image sensors that would be required to achieve high resolutions without the claimed invention, lower image quality caused by cross-talking between adjacent pixels and higher clocking rates.”).

209. *See Yu*, 1 F.4th at 1044 (citing *Chargepoint*, 920 F.3d, at 769, in which the court observed that “any reliance on the specification in the § 101 analysis must always yield to the claim language.”).

210. *Id.*

211. *Id.*

212. *See id.* at 1044-45 (suggesting that the Federal Circuit would not have held that a claim to a four-lens, four-image-sensor configuration was directed to an abstract idea because the specification described “many obvious benefits and advantages” in relation to the four-lens, four-image-sensor configuration in which three of the sensors were color-specific while the fourth was black-and-white).

213. Brief for Plaintiffs-Appellants at 42-43, *Yu*, 1 F.4th 1040 (Nos. 20-1760, 20-1803).

214. The term “preemption” in relation to a patent claim implies a judicial concern that “claims that forestall competitive development . . . can have an overly broad impact on downstream innovation” and thus should “not [be] eligible for patent protection.” *See* Arpita Bhattacharya, *Unpatentably Preemptive? A Case Against the Use of Preemption as a Guidepost for Determining Patent Eligibility*, NE. U. L. REV. EXTRA LEGAL (Apr. 23, 2014), [www.nulawreview.org/extralegalrecent/unpatentably-preemptive-a-case-](http://www.nulawreview.org/extralegalrecent/unpatentably-preemptive-a-case-)

claims containing abstract ideas) often viewed as discouraging invention.<sup>215</sup> Yu asserted that there was no preemption concern as his claims were narrowly focused on an improved digital camera with multiple image sensors of specific type and configuration to produce a digital image in a specific manner.<sup>216</sup> Put simply, Yu argued that his claims were not broad enough to preempt every use of the digital camera and were narrowly focused only on a particular type of digital camera which produces a digital image in a specific manner.<sup>217</sup> Judge Prost, however, did not address this argument, possibly agreeing with the district court that the absence of complete preemption did not demonstrate patent eligibility.<sup>218</sup>

Accordingly, under step one of the *Alice* test, the majority agreed with the district court that Claim 1 of the '289 patent was directed to a patent ineligible abstract idea.<sup>219</sup>

2. *Under Step Two of the Alice test, Yu's Claim 1 did not Include an Inventive Concept Sufficient to Transform the Claimed Abstract Idea into a Patent-Eligible Invention*

After analyzing Yu's Claim 1 under step one of the *Alice* test, the court turned to step two.<sup>220</sup> This step requires a court to determine whether the claim contains an inventive concept sufficient to transform the abstract idea into a patent-eligible application.<sup>221</sup> The Federal Circuit again agreed with the district court's step two analysis, seeing no inventive concept that would confer patent eligibility.<sup>222</sup> Judge Prost found that Yu's Claim 1 failed at step two because it was recited at a high level of generality and merely invoked "well-understood, routine, conventional [physical] components" for implementing the abstract idea of using

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against-the-use-of-preemption-as-a-guidepost-for-determining-patent-eligibility [perma.cc/MN2Q-2JV7] (observing that "[s]ince its inception in the [*Benson*] opinion, preemption has been mentioned in every Supreme Court opinion focusing on [patent eligibility analysis under 35 U.S.C. § 101].").

215. See N. Scott Pierce, *Patent Eligibility as a Function of New Use, Aggregation, and Preemption Through Application of Principle*, 23 RICH. J.L. & TECH. 1, 75 (2017) (explaining that the two-part *Alice* test was promulgated by the Supreme Court to "bar patent protection that would preempt use of any of the judicial exceptions themselves.").

216. Brief for Plaintiffs-Appellants at 42-43, *Yu*, 1 F.4th 1040 (Nos. 20-1760, 20-1803).

217. *Id.*

218. See *Yu*, 2020 WL 1429773, at \*5 (suggesting that Yu's attempt to limit the breadth of the claims based on alternative configurations described in the specification does not change the conclusion that the claims were directed to patent ineligible subject matter).

219. *Yu*, 1 F.4th at 1045.

220. *Id.*

221. *Alice Corp.*, 573 U.S. at 217-18.

222. *Yu*, 1 F.4th at 1045.

multiple pictures to enhance each other.<sup>223</sup>

Yu attempted to rely on the prosecution history to demonstrate the unconventional or inventive nature of the claimed camera architecture, in which at least one image sensor was responsive to a full region of visible color spectrum.<sup>224</sup> Since the USPTO patent examiner found his claims allowable over the multiple prior art references, Yu explained that it would be logically impossible for the camera's architecture to be both novel and non-obvious, and yet conventional.<sup>225</sup> Essentially, Yu argued that claims which satisfy the novelty and non-obviousness requirements should constitute inventive concepts, at least on the basis that the prior arts failed to teach or suggest all of the recited claimed features.<sup>226</sup> However, the majority also rejected this argument, stating that section 101 patent eligibility and section 102 novelty were separate inquiries<sup>227</sup> and, therefore, "even if claim 1 recite[d] novel subject matter, that fact was insufficient by itself to confer eligibility."<sup>228</sup> This suggests that the novelty of claimed subject matter alone does not make an otherwise abstract idea patent-eligible.<sup>229</sup>

Continuing with step two of the *Alice* test, the court considered each claim element both individually and as an ordered combination to determine whether the additional elements transform the claim into a patent-eligible application.<sup>230</sup> Yu also relied on the claimed combination of limitations to show that the type, configuration, and manner of the use of images were unconventional.<sup>231</sup> Yu contended that the district court erroneously characterized the claims as merely "taking two pictures and using those pictures to enhance each other in some way."<sup>232</sup> Instead, Yu argued that the combination of the asserted claims should be characterized as digital images being captured using image sensors positioned in a particular manner within the camera.<sup>233</sup> Yu also submitted that the claimed

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223. *Id.*

224. Brief for Plaintiffs-Appellants at 56, *Yu*, 1 F.4th 1040 (Fed. Cir. 2021) (Nos. 20-1760, 20-1803).

225. *See id.* (stating that claims of the '289 patent were allowed by the patent examiner because the prior digital cameras with multiple image sensors were not sensitive to a full visible color spectrum as suggested in claims of the '289 patent).

226. *Id.*

227. In *Two-Way Media v. Comcast Cable Communications*, the Federal Circuit explained that finding a novel claimed feature in a claim does not automatically "avoid the problem of abstractness"). *Two-Way Media Ltd v. Comcast Cable Commc'ns., LLC*, 874 F.3d 1329, 1340 (Fed. Cir. 2017).

228. *Yu*, 1 F.4th at 1045.

229. *See id.* (stating that subject matter eligibility and novelty are separate inquiries).

230. *Alice Corp.*, 573 U.S. at 217-18.

231. Brief for Plaintiffs-Appellants at 57, *Yu*, 1 F.4th 1040 (Nos. 20-1760, 20-1803).

232. *Id.*

233. *Id.* at 58 (noting that closely positioning the image sensors with respect

combination of limitations differed from prior multiple-sensor cameras which used prisms instead of image sensors that were “closely positioned with respect to a common plane.”<sup>234</sup> In short, Yu argued that the claimed hardware configuration was “vital” to performing the claimed image enhancement and, therefore, the claimed combination of limitations was unconventional enough to transform the abstract idea into a patent-eligible claim.<sup>235</sup>

The Federal Circuit rejected these arguments as well, noting that patent ineligibility at step two of the *Alice* test cannot be avoided by merely showing that conventional computer equipment is “vital” to a claimed advancement (i.e., image enhancement) which is still an abstract idea.<sup>236</sup> The majority explained that the claimed hardware configuration (i.e., image sensors, lenses, analog-to-digital converting circuitry, image memory, and a digital image processor) was no advancement over the prior arts, and therefore could not itself be used to enhance one image using another, which it determined was an abstract idea.<sup>237</sup> The court also noted that the claimed generic hardware limitations of Yu’s Claim 1 merely served as a conduit<sup>238</sup> for the abstract idea of image enhancement without providing enough substance.<sup>239</sup> The Federal Circuit then concluded that Yu’s Claim 1 failed step two of the *Alice* test, finding no inventive concept in the claim that would transform the abstract idea into a patent-eligible invention.<sup>240</sup>

Because Yu’s Claim 1 failed both steps of the *Alice* test, the

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to a common plane is important to “ensure that the digital image capture portions of the same at sufficiently close locations within the images to allow them to be brought into registration with one another.”).

234. *Id.* at 58-59 (explaining that prior multiple-sensor cameras used sensors that captured light from only distinct bands of lights (e.g., red, green, or blue) whereas Yu’s camera used a sensor (as recited in Yu’s Claim 2) that was “sensitive to a full region of visible color spectrum.”).

235. *Yu*, 1 F.4th at 1045.

236. *Id.* (citing to *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1168-70 (Fed. Cir. 2018), in which patentee claimed mathematical data manipulation that necessarily required use of computers, but the Federal Circuit nevertheless held the claims as abstract because the computers required were not unconventional).

237. *Id.*

238. The term “conduit” in patent context implies that a claimed physical component is implemented in a conventional manner to perform an abstract idea, rather than being substantially modified to add any substance to the abstract idea. See *TLI Commc’ns. LLC*, 823 F.3d, at 612-13 (explaining that, in relation to patent eligibility of a claim describing a method of recording and administering digital images, “a physical component such as a telephone unit merely acts as “a conduit for the abstract idea of classifying an image and storing the image based on its classification” and that conventional components cannot elevate “an otherwise ineligible claim into a patent[-]eligible improvement.”).

239. See *Yu*, 1 F.4th at 1045 (explaining that Yu could not overcome the fact that Claim 1 was missing an inventive concept by relying on unclaimed hardware configurations described in the specification).

240. *Id.*

majority affirmed the district court's decision granting Apple and Samsung's joint motion to dismiss Yu's Claims as invalid under section 101.<sup>241</sup>

### *B. Analysis of Dissent Opinion*

In her dissent, Judge Newman<sup>242</sup> argued that the majority misunderstood the section 101 patent-eligibility issue and altered the section 101 analysis to require a section 102 novelty-type analysis.<sup>243</sup> Newman contended this was contrary to the statute and precedent.<sup>244</sup> She also warned that the decision potentially increases uncertainty surrounding the section 101 patent-eligibility inquiry to all areas of innovation, not just biological or computer-implemented technologies.<sup>245</sup>

#### *1. A Digital Camera Performing a Specified Function with a Designated Structure is not an Abstract Idea*

The dissent criticized the majority for diluting Yu's Claim 1 as only being directed to the "abstract idea of taking pictures (which may be at different exposures) and using one picture to enhance the other in some way."<sup>246</sup> Judge Newman instead summarized the '289 patent as claiming a "digital camera having two lenses mounted in front of separate image sensors, with analog to digital conversion circuitry, a memory that stores the images, and a digital processor that enhances the images."<sup>247</sup> She reasoned that Yu's Claim 1 was a digital camera with a designated structure and mechanism that performed specified functions.<sup>248</sup> Newman also observed that a camera, being a mechanical and electronic device of defined structure and mechanism, cannot be an abstract idea and should easily fit the standard subject matter eligibility criteria.<sup>249</sup>

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241. *Id.* at 1041.

242. "Judge Pauline Newman has earned a reputation as the Federal Circuit's 'Great Dissenter'" and her dissents in patent law "concern validity issues, especially on issues of novelty and non-obviousness." Daryl Lim, *I Dissent: The Federal Circuit's "Great Dissenter," Her Influence on the Patent Dialogue, and Why It Matters*, 19 VAND. J. ENT. & TECH. L. 873, 874-79 (2017).

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

244. *Id.*

245. See Joseph M. Hallman, *Dissent by Judge Newman highlights the expanding instability in the patent eligibility inquiry under § 101*, LEXOLOGY (June 30, 2021), [www.lexology.com/library/detail.aspx?g=52d96fa8-2aad-44b0-9b39-5df58e7df0d3](http://www.lexology.com/library/detail.aspx?g=52d96fa8-2aad-44b0-9b39-5df58e7df0d3) [perma.cc/R6L5-EW33] (stating that "[s]ome, including Judge Newman, disagree with [the majority opinion in *Yu v. Apple*], which leads to the confusion and lack of clarity.>").

246. *Yu*, 1 F.4th at 1047 (Newman, J., dissenting).

247. *Id.*

248. *Id.*

249. *Id.* at 1046.



## 2. *It is Improper to Bring Novelty Requirements into Subject Matter Eligibility Analysis*

Judge Newman's dissent highlighted the explicit distinction between section 101 (which sets forth the patentable subject matter) and section 102 (which covers the conditions relating to novelty).<sup>250</sup> The majority, under step one of the *Alice* test, held that the '289 patent recited an abstract idea without more "because the camera's components were well-known and conventional and perform only their basic functions."<sup>251</sup> Judge Newman argued that the majority's consideration of novelty factors (i.e., whether the claimed elements are anticipated by the prior arts) in the subject matter eligibility analysis was improper.<sup>252</sup> In making this observation, she relied on *Diehr*,<sup>253</sup> explaining that the question of whether a particular invention is novel is "wholly apart from whether the invention falls into a category of subject matter."<sup>254</sup> Newman reasoned that a device using known components does not become an abstract idea merely on that basis and is no reason to make a claim ineligible.<sup>255</sup> She also explained that while patent-eligible subject matter must meet the substantive standards of patentability in order to receive a patent, section 101 ineligibility does not arise simply because a digital camera embodies minor and predictable differences from the prior art.<sup>256</sup> Phrased differently, the dissenting opinion signifies that the novelty of claimed elements should not be considered during subject-matter eligibility analysis under section 101.<sup>257</sup>

## 3. *Majority's Holding Brings Fresh Uncertainties in all Fields of Technologies*

Judge Newman continued by pointing out that the current state of section 101 jurisprudence has brought inconsistency and unpredictability in adjudicating subject matter eligibility issues.<sup>258</sup> She observed that the inconsistent and unpredictable adjudication

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250. *Id.* at 1047-48 (noting that the distinction was set forth in the Supreme Court's discussion in *Diehr* regarding the codification of 1952 Patent Act).

251. *Id.*

252. *Id.*

253. In *Diehr*, the Court distinguished Section 101 and 102, explaining that the section 101 language "new and useful" is a "general statement of the type of subject matter that is eligible for patent protection," while section 102 "covers in detail the conditions relating to novelty." See *Diehr*, 450 U.S. at 189-91 (stating that a rejection of claims for failing to "satisfy the statutory conditions of novelty under § 102 or non-obviousness under § 103 . . . does not affect the determination that [patentee's] claims recited subject matter which was eligible for patent protection under § 101.").

254. *Yu*, 1 F.4th at 1047-48. (Newman, J., dissenting)

255. *Id.*

256. *Id.*

257. See *id.* (citing *Diehr*, 450 U.S. at 190).

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

has destabilized technological development in important fields of commerce.<sup>259</sup> Newman then noted that the section 101 uncertainties have affected not only biological and computer-implemented technologies, but also other fields of technologies.<sup>260</sup> She further criticized the majority for expanding section 101's eligibility analysis by requiring a claimed device's components to be unknown and unconventional, without reaching the novelty and non-obviousness requirements.<sup>261</sup> Judge Newman admonished the majority for the destabilizing effects that similar holdings have already had on U.S. patent policy.<sup>262</sup>

Accordingly, from the dissent's view, the claimed digital camera could not be an abstract idea because it was a mechanical and electronic device with clear designated structure performing specified functions.<sup>263</sup> Therefore, a claim directed to a digital camera should have easily satisfied the subject matter eligibility criteria.<sup>264</sup>

#### IV. PERSONAL ANALYSIS: WHAT COULD HAVE BEEN DONE

The Federal Circuit's decision in *Yu v. Apple* is notable for several reasons. It was the first time a digital camera with a clearly designated structure that performed specified functions was held patent-ineligible for describing an abstract idea.<sup>265</sup> *Yu v. Apple* reflects a shift from previous Federal Circuit decisions which suggested that claims reciting a physical device should not be considered abstract ideas.<sup>266</sup> The decision also added a novelty requirement to physical components recited in the claims during patent eligibility analysis.<sup>267</sup> This is a direct departure from the

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259. *Id.*

260. *Id.* For example, in *American Axle*, the Federal Circuit invalidated claims to a process of making a driveshaft of an automobile. *Am. Axle & Mfg.*, 939 F.3d at 1358. As another example, in *Chamberlain*, the Federal Circuit held that a claim to a garage door opener is directed to a patent-ineligible abstract idea. *Chamberlain Grp.*, 935 F.3d at 1344. Thus, abstract idea exception has been used by the Federal Circuit to invalidate patents in fields other than biological and computer-implemented technologies.

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

262. A. Shane Nichols, *Diehr Alice, Yu are Superimposing Novelty onto Patent Eligibility*. *Love, Newman.*, NAT'L L. REV. (June 24, 2021), [www.natlawreview.com/article/diehr-alice-yu-are-superimposing-novelty-patent-eligibility-love-newman](http://www.natlawreview.com/article/diehr-alice-yu-are-superimposing-novelty-patent-eligibility-love-newman) [perma.cc/7A5B-TWKD].

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

264. *Id.*

265. *Id.* at 1042-46.

266. See Noah C. Graubart & Tae Hong, *Federal Circuit Finds Digital Camera an Abstract Idea*, FR BLOG (July 6, 2021), [www.fr.com/federal-circuit-finds-digital-camera-an-abstract-idea/](http://www.fr.com/federal-circuit-finds-digital-camera-an-abstract-idea/) [perma.cc/YH8V-KJDG] (citing *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1257 (Fed. Cir. 2017), in which the "Federal Circuit found patent-eligible claims drawn to a computer memory system comprising a main memory, a bus, and a cache, all of which were programmable to determine the type of memory stored in the cache.").

267. See Pearlman, *supra* note 169 and accompanying text.

Court's holding in *Diehr*—that novelty is irrelevant in determining patent-eligibility—thereby blurring the line between the novelty and subject matter eligibility requirements.<sup>268</sup> *Yu v. Apple* further shows the Federal Circuit's willingness to expand the abstract idea doctrine to all technological fields and not just biological and computer-implemented technologies. The court's expansion of the doctrine increases the inventor population potentially impacted by the uncertainty of obtaining a valid patent. Such uncertainty only weakens the U.S. patent system, which has been a key driver of America's innovation economy for over two hundred years.<sup>269</sup>

This case note calls on the judiciary to eliminate the uncertainty in applying abstract idea doctrine for determining patent-eligibility by either adopting a dictionary definition for the term “abstract idea” or abandoning the doctrine entirely. Part A of this section proposes a definition for the term “abstract idea” consistent with the dictionary definitions. Part B explains how the judiciary's refusal to define the term “abstract idea” may weaken the U.S. patent system. Finally, Part C discusses the Federal Circuit's approach in *Yu v. Apple* in identifying an abstract idea in a patent claim and explains how this approach is unworkable.

### A. Dictionaries Provide a Consistent Definition for the Term “Abstract Idea”

A search across several sources for the definition of the term “abstract” invariably indicates that the term cannot be synonymous with words such as “physical,” “concrete,” “specific,” “material,” “actual,” “real,” or “tangible.”<sup>270</sup> For instance, the printed version of

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268. See *Diehr*, 450 U.S. at 189-90 (explaining that novelty has “no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter” and further stating “[i]t has been urged that novelty is an appropriate consideration under § 101. Presumably, this argument results from the language in § 101 referring to any ‘new and useful’ process, machine, etc. Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection ‘subject to the conditions and requirements of this title.’ Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty. The question therefore of whether a particular invention is novel is ‘wholly apart from whether the invention falls into a category of statutory subject matter.’”) (quoting *In Re Bergy*, 596 F.2d 952, 961 (C.C.P.A. 1979)).

269. See Adam Mossoff & Kevin Madigan, *Federal Circuit Brings Some Clarity and Sanity Back to Patent Eligibility Doctrine*, GEO. MASON U. (July 14, 2016), [cip2.gmu.edu/2016/07/14/federal-circuit-brings-some-clarity-and-sanity-back-to-patent-eligibility-doctrine/](http://cip2.gmu.edu/2016/07/14/federal-circuit-brings-some-clarity-and-sanity-back-to-patent-eligibility-doctrine/) [perma.cc/883H-NJSW] (observing that “the Court's highly generalized patent-eligibility tests to inventions in the high-tech and bio-pharmaceutical sectors . . . threatens the startups, new jobs, and economic growth that the patent system has been proven to support.”).

270. See, e.g., *abstract*, DICTIONARY.COM, [www.dictionary.com/browse/abstract](http://www.dictionary.com/browse/abstract) [perma.cc/F9C6-Z9U8] (last visited Oct. 29, 2022) (defining the adjective “abstract” as “thought of apart from concrete realities, specific objects,

the Oxford Dictionary defines the term “abstract” as “relating to ideas or qualities rather than physical things.”<sup>271</sup> The online version similarly defines the term “abstract” as “existing in thought or as an idea but not having a physical or concrete existence.”<sup>272</sup> This definition can similarly be extended to define the term “abstract idea” as one that lacks a physical structure or dimension. Think of an abstract idea as something that cannot be perceived through the five senses traditionally ascribed to humans—vision, hearing, taste, smell, and touch. To illustrate, take the number “three.” We know what “three” represents and where it falls within the numerical sequence because humans give a specific meaning to the number “three.”<sup>273</sup> However, we also know that the number “three” cannot be seen, heard, tasted, smelled, or touched. The number “three” can, therefore, be considered an abstract idea that can be perceived and/or appreciated only through our minds. However, an abstract idea or the concept “three” can be turned into a physical form. For example, one can touch “three” pens placed on a desk or one can hear what “three” pens sound like by tapping them on the desk.<sup>274</sup> Accordingly, we have taken an abstract idea of the number “three” and turned it into a concrete idea by providing a physical dimension in the form of pens.<sup>275</sup> This example demonstrates that an abstract idea can be converted into a concrete idea by merely tying the abstract idea to a physical structure. The judiciary should adopt a similar definition for the term “abstract idea” and to rule that only those claims not reciting a physical or tangible structure can constitute an abstract idea. A definition that abstract ideas lack a physical structure is also consistent with previous Supreme Court’s decisions holding that mathematical formulas and fundamental economic practices (which lack a physical structure unless embodied in a machine) are abstract ideas.<sup>276</sup> Moreover, a clear

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or actual instances,” “having no reference to material objects or specific examples; not concrete,” and “not applied or practical; theoretical. . .”).

271. *Abstract*, OXFORD ENG. DICTIONARY (7th ed. 2021).

272. David Zuckerman, *Abstraction and Indefiniteness: Expanding the Traditional Interpretation of 35 U. S. C. S 112(b) to Cover the Abstract Idea Doctrine*, 23 GEO. MASON L. REV. 423, 444 (2016).

273. See Marcel Iseli, *Abstract Ideas: Meaning & Examples*, LINGUABLOG (May 3, 2021), [linguaholic.com/linguablog/abstract-ideas-meaning-examples/](https://linguaholic.com/linguablog/abstract-ideas-meaning-examples/) [perma.cc/JDW9-LEFK] (concluding that “[w]hile an individual abstract idea might be difficult to define, the concept of an abstract idea is simple. Most things that humans think of begin as abstract ideas before they become concrete.”).

274. See *id.* (illustrating that “the abstract concept ‘seven’ [can be] turned into a concrete idea” by pulling seven pens out of your desk, setting them out and then by counting them, touching them etc.).

275. See *id.* (illustrating that anything that can be experienced physically could not be an abstract idea).

276. See, e.g., *Alice Corp.*, 573 U.S. at 209, 222 (stating that the “[mathematical] formula itself was an abstract idea” and further a “fundamental economic practice long prevalent in our system of commerce” is an “abstract idea” beyond the scope of section 101).

definition for the term “abstract idea” will help combat the legal uncertainty and unpredictability concerning application of the abstract idea doctrine.<sup>277</sup>

### *B. A Lack of Definition for the Term “Abstract Idea” Weakens the Patent System*

As discussed above, it is well-understood that an abstract idea embodied in a physical form can no longer be an abstract idea.<sup>278</sup> The Supreme Court, however, has refused to accept this principle.<sup>279</sup> In fact, the *Alice* Court specifically chose not to “delimit the precise contours of the ‘abstract ideas’ category.”<sup>280</sup> Instead, the Court found it sufficient to use the concepts presented in previous cases as a guide for determining whether a given concept is an abstract idea.<sup>281</sup> The Federal Circuit also never attempted to define the term.<sup>282</sup> It explained that there is a problem with articulating a single, universal definition of “abstract idea” because it is difficult to fashion a workable definition to apply to unknown inventions.<sup>283</sup> The judiciary’s unwillingness to define the abstract idea exception’s limits has only resulted in the federal courts, the Patent Trial and Appeal Board, and the USPTO using the very lack of definition to liberally expand the exception.<sup>284</sup>

277. See Gene Quinn, *It is time to define the term ‘Abstract Idea’*, IPWATCHDOG (May 18, 2017), [www.ipwatchdog.com/2017/05/18/time-define-term-abstract-idea/id=83393/](http://www.ipwatchdog.com/2017/05/18/time-define-term-abstract-idea/id=83393/) [perma.cc/E8QN-C8YU] (observing that the current abstract idea doctrine is “unpredictable and never repeatable . . . because different judges and panel configurations apply it based on their own subjective views” and that the judiciary has defined the term “abstract idea. . .”).

278. See *supra* notes 270-71 and accompanying text (consistently defining the term “abstract” or “abstract idea” as not being equivalent to terms like “physical,” “concrete,” “specific,” “material,” “actual,” “real,” or “tangible”).

279. See, e.g., *Alice Corp.*, 573 U.S. at 223-24 (stating that mere recitation of a generic computer, which necessarily exists in the physical form, cannot transform a patent-ineligible abstract idea into a patent-eligible invention).

280. *Id.* at 221.

281. See *id.* (explaining that “the concept of intermediated settlement” at issue in *Alice* is an abstract idea because it is not meaningfully distinct from “the concept of risk hedging” which has previously been held as an abstract idea in *Bilski*).

282. See Quinn, *supra* note 277 (observing that “[t]he Federal Circuit [is] seemingly uninterested in bringing any certainty to patent laws” and the Federal Circuit “has said that if the Supreme Court does not need to labor to define the term ‘abstract idea’ then neither do they.”).

283. See *Amdocs (Isr.) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1294 (Fed. Cir. 2016) (observing that “a search for a single test or definition in the decided cases concerning § 101 from [the Federal Circuit] court, and indeed from the Supreme Court, reveals that at present there is no such single, succinct, usable definition or test.”).

284. See Robert Sachs, *The One Year Anniversary: The Aftermath of #AliceStorm*, BILSKI BLOG (June 20, 2015), [www.fenwick.com/bilski-blog/the-one-year-anniversary-the-aftermath-of-alicestorm](http://www.fenwick.com/bilski-blog/the-one-year-anniversary-the-aftermath-of-alicestorm) [perma.cc/J9YQ-4CRL]

Now, the abstract idea exception covers everything from computer animation, database architecture, digital photograph management, electric car chargers, garage door openers, and even automobile safety systems.<sup>285</sup> Continually expanding the abstract idea doctrine while providing minimal guidance on what is an “abstract idea” only leads to unpredictable results. This unpredictability makes the entire process of obtaining patents more difficult for applicants.<sup>286</sup> Even if applicants can get a patent issued from the USPTO, it may be invalidated by the judiciary for describing an abstract idea without any explanation or guidance on why the claimed concept is an abstract idea. This legal uncertainty and unpredictability surrounding the abstract idea doctrine’s application only weakens the U.S. patent system.<sup>287</sup>

### C. Federal Circuit’s Approach to Identifying an Abstract Idea in the Claim is Unworkable

*Yu v. Apple* is the latest Federal Circuit decision to further expand the contours of the abstract idea exception to cover a specific-purpose machine—a digital camera.<sup>288</sup> The decision not only failed to define “abstract idea,” but also added a section 102 “novelty” requirement for physical components recited in the claim to avoid abstract idea characterization.<sup>289</sup> This section discusses the Federal Circuit’s approach in *Yu v. Apple* to determine whether a claimed concept is an abstract idea and how it only complicates the already unworkable abstract idea doctrine.

In *Yu v. Apple*, the Federal Circuit first broadly characterized Yu’s claim as directed to “taking two pictures (which may be at different exposures) and using one picture to enhance the other in some way.”<sup>290</sup> However, in doing so, it discounted other claimed limitations—including physical components recited in Yu’s claim.<sup>291</sup> The court then reasoned that enhancing digital images using other

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(explaining how the Supreme Court’s decision in *Alice* has impacted patent practitioners practicing before the USPTO).

285. *Id.*

286. Toole & Pairolero, *supra* note 127, at 1.

287. *See* Mossoff & Madigan, *supra* note 269 (observing that the Court’s highly generalized patent-eligibility tests to inventions in the high-tech and biopharmaceutical sectors threaten the U.S. patent system).

288. *See Yu*, 1 F.4th at 1041-46 (holding a claim directed toward a digital camera is a patent-ineligible abstract idea).

289. *See id.* at 1047-48 (Newman, J., dissenting) (observing that the majority’s consideration of novelty factors (i.e., whether the claimed elements are anticipated by the prior arts) into subject matter eligibility analysis is improper).

290. *Id.* at 1043.

291. *See id.* (noting that Yu’s claim 1 results in “producing a resultant digital image from said first digital image enhanced with said second digital image. . .”).

images is an abstract idea because the idea of using multiple pictures to enhance each other has been known by photographers for over a century.<sup>292</sup> This reasoning suggests that anything known or used before would be held as an abstract idea. According to the Federal Circuit, a novel abstract idea is no longer an abstract idea, irrespective of whether the abstract idea is embodied in a physical structure.<sup>293</sup> The Federal Circuit also used a section 102 novelty-type analysis to determine whether a claimed concept (which itself can be broadly characterized by the courts) is directed to an abstract idea.<sup>294</sup>

The Federal Circuit's new approach is discordant with the well-understood meaning that an abstract idea embodied in a physical structure cannot remain abstract.<sup>295</sup> In addition, it fails to define an "abstract idea" while adding a new criterion requiring that abstract ideas be novel to avoid being characterized as such. If novelty alone determines whether something is not abstract, then Yu's claim should have easily passed muster because Yu already had a validly-issued patent,<sup>296</sup> which provided a presumption that the claim was novel and not obvious.<sup>297</sup> The Federal Circuit never rebutted this presumption since Yu's claim was not reviewed under the substantive criteria of patentability—i.e., novelty, non-obviousness, utility, enablement, and written description.<sup>298</sup> At the same time, the court also found it unnecessary to consider expert testimony in assessing the "novelty" of the claimed concept deemed to be an abstract idea.<sup>299</sup> The Federal Circuit found it sufficient to simply

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292. *Id.*

293. *See id.* (suggesting that since the physical components recited in Yu's claim are well-known and conventional, carrying out an abstract idea using known physical components cannot transform the abstract idea into a patent-eligible invention).

294. *See Pearlman, supra* note 169 (stating that "[t]he decision in *Yu v. Apple* adds a patentability requirement to electronic devices," thereby "blur[ring] the lines between subject matter patentability and novelty. . .").

295. *See supra* notes 270-71 and accompanying text (consistently defining the term "abstract" or "abstract idea" as not being equivalent to terms like "physical," "concrete," "specific," "material," "actual," "real," or "tangible").

296. Claim 1 of Yu's patent recites mechanical and electrical components such as "a first and a second image sensor," "two lenses," "an analog-to-digital converting circuitry," and "a digital image processor." '289 Patent.

297. Kristina A. Walker, *To Be Presumed or Not to Be Presumed . . . That Is the Enablement Question*, 5 J. MARSHALL REV. INTELL. PROP. L. 140, 140 (2005) (stating that "a patent is presumptively valid once issued by the USPTO," implying that an issued patent is presumed novel and non-obvious unless "a party challenging the patent [successfully proved] invalidity due to anticipation [or obviousness] by clear and convincing evidence.").

298. *See Yu*, 1 F.4th at 1048 (Newman, J., dissenting) (observing that the '289 patent claims "warrant review under the substantive criteria of patentability – a review that they have never received.").

299. *See id.* at 1046 (explaining that it was not an error for the district court to determine the patent eligibility at the Rule 12(b)(6) stage without the aid of expert testimony).

declare a claimed concept an “abstract idea” based on taking judicial notice that the claimed concept was not new.<sup>300</sup>

However, the Federal Circuit’s reliance on judicial notice to declare a claimed concept an abstract idea will only dilute the quality of decisions in patent cases. Whether courts should rule on a highly complex technology such as the digital camera patent at issue in *Yu v. Apple* without first hearing expert testimony is also questionable.<sup>301</sup> It is a fact that judges, for the most part, lack the scientific expertise arguably necessary to comprehend and decide on highly technical patent cases.<sup>302</sup> The Federal Circuit is no exception as only a few Federal Circuit judges have a technical or scientific background.<sup>303</sup> Any fact-finding (such as whether a claimed concept is an abstract idea) in patent cases will strongly benefit from scientific and technical expertise obtainable through expert testimony.

Even assuming that a claim directed at enhancing digital images using other images is an abstract idea, Yu’s claim did not recite the concept of enhancing images in a vacuum. Rather, Yu’s claim described the use of a digital camera’s physical components to enhance the pictures.<sup>304</sup> But apparently the Federal Circuit disagrees with the principle that a physical structure can transform an abstract idea into a concrete idea. Now, patent law is left with section 102 novelty-type analysis when applying the abstract idea doctrine, which is unworkable because novelty cannot be analyzed without substantively comparing the claimed elements to the prior arts. It defies logic to hold that a claimed concept is an abstract idea for lack of novelty after the USPTO issued a patent because, at that point, the agency already assessed novelty against prior arts and determined it was sufficiently new.<sup>305</sup> Moreover, incorporating a

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300. *See id.* (stating that “[i]n ruling on a 12(b)(6) motion, a court need not accept as true allegations that contradict matters properly subject to judicial notice or by exhibit, such as the claims and the patent specification.”).

301. *See* Brief for Plaintiffs-Appellants at 43, *Yu*, 1 F.4th 1040 (Nos. 20-1760, 20-1803) (arguing that “the District Court was predisposed at the outset to find the claims patent-ineligible based upon its own belief that photographers had been using multiple pictures to enhance each other for over a century” and “that the District Court greatly oversimplified, and at the same time completely overestimated its ability to understand--without the assistance of expert testimony or a special master--the highly complex technology at issue in this case.”).

302. *See* Michael Goodman, *What’s So Special About Patent Law?*, 26 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 797, 835 n.188 (2016) (explaining “that the judiciary’s difficulty with patent cases is not the law, but is instead that patent cases often involve difficult subject matter, which sometimes requires technical or scientific expertise.”).

303. *Id.*

304. Claim 1 of Yu’s patent recited mechanical and electrical components such as “a first and a second image sensor,” “two lenses,” “an analog-to-digital converting circuitry,” and “a digital image processor.” ’289 Patent.

305. *See* Dennis D. Crouch, *Is Novelty Obsolete? Chronicling the Irrelevance of the Invention Date in U.S. Patent Law*, 16 *MICH. TELECOMM. TECH. L. REV.*



novelty-type analysis when applying the abstract idea doctrine is also inconsistent with the Court's decision in *Diehr*. *Diehr* clarified that novelty is irrelevant to the question of subject-matter patentability.<sup>306</sup> Dissenting Judge Newman emphasized this point while criticizing the majority for improperly incorporating novelty factors into subject matter eligibility analysis.<sup>307</sup>

The Federal Circuit's unworkable, unclear, and inconsistent approach and corresponding expansion of the abstract idea doctrine to cover all technological fields will only weaken the U.S. patent system. It may encourage innovators to abandon their inventive efforts or to seek patent protection in countries where there is more certainty of getting patent protection than in the United States. Therefore, the judiciary should precisely define the abstract idea doctrine's contours to ensure a workable, clear, and consistent application by practitioners, examiners, and judges. If this is not feasible, the judiciary should at least adopt the dictionary definitions that clearly explain that abstract concepts linked to physical structures cannot be abstract ideas.

Alternatively, if both options fail, the judiciary should consider abandoning the abstract idea doctrine entirely. It could be argued that abandoning the abstract idea doctrine would result in patents claiming abstract ideas that are so fundamental that patenting them would preempt the future use of the claimed abstract ideas in all fields.<sup>308</sup> Preemption of abstract ideas may further stifle the very progress of innovation that Congress is authorized to promote.<sup>309</sup> However, this argument ignores that patent law has several other substantive requirements in place, including novelty, non-obviousness, utility, enablement, and written description requirements.<sup>310</sup> These substantive requirements would still act as a barrier to patentability of a claimed concept covering only an abstract idea and make abandoning the abstract idea doctrine less problematic.<sup>311</sup> For example, a claimed concept covering only an abstract idea may be held unpatentable for failing to clearly or adequately describe the underlying tangible structure required to

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53, 64 (2009) (explaining that the "core of patent examination [at the USPTO] involves a comparison of the claimed invention against the prior art in order to determine whether the invention is sufficiently new.").

306. See *Diehr*, 450 U.S. at 189-90.

307. See *Yu*, 1 F.4th at 1047-48 (Newman, J., dissenting) (arguing that "a device that uses known components does not thereby become an abstract idea, and is not on that ground ineligible for access to patenting.").

308. See *Bilski*, 561 U.S. at 612 (stating that preemption "would effectively grant a monopoly over an abstract idea.").

309. *Id.* at 649.

310. See 35 U.S.C. §§ 102, 103, 112 (2022).

311. See Cahoy, *supra* note 24, at 50 (stating that "other patentability standards--including novelty, non-obviousness, enablement etc.--remain in place to serve as a barrier to make reduction of 101 less problematic.").

carry out the claimed concept.<sup>312</sup> For these reasons, patents claiming non-technical fundamental abstract ideas and attempting to preempt an entire field can be disqualified without applying the abstract idea doctrine. In addition, patent law is well-settled when it comes to applying the substantive requirements to patentability.<sup>313</sup> Patent-eligibility analysis should therefore not solely rest on subject matter eligibility under section 101.<sup>314</sup> Eliminating the abstract idea doctrine in favor of the substantive requirements of patentability may bring predictability and certainty to patent validity cases decided in courts.<sup>315</sup>

## V. CONCLUSION

*Yu v. Apple* is one of several recent decisions that expanded the scope of the abstract idea doctrine to electronic and mechanical devices with integrated hardware components intended to perform specific functions or achieve a specific result. The judiciary has been inconsistent in applying the abstract idea doctrine, resulting in uncertainties in the minds of inventors, patent practitioners, and patent examiners. Such uncertainties weaken the patent system because the abstract idea doctrine can be arbitrarily applied to potentially invalidate any patent claiming a specific purpose device with sufficiently defined physical structure. A weakened patent system, where there is a high likelihood of disqualifying patents based on an unworkable and undefined judicial doctrine, can lead to several adverse consequences. A weakened patent system would promote free riding of patented products and processes by infringers.

Further, where patents can be disqualified based solely on an unclear judicial doctrine, infringers are more likely to challenge the validity of patents at considerable expense, time, and risk to the

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312. See Zuckerman, *supra* note 272, at 443 (explaining that a claim directed to an abstract idea cannot fulfill the section 112 enablement requirement because “an abstract idea is, almost by definition, too broad to be ‘enabled’ by the specification.”).

313. See e.g., Rodney Swartz, *Separating Preemption from the Subject Matter Analysis of 35 U.S.C. 101*, 61 SANTA CLARA L. REV. 903, 835 n.188 (2021) (observing that the law of non-obviousness under section 103 is well settled).

314. See Gene Quinn, *Supreme Court “Abstract Idea Doctrine” is Unworkable*, IPWATCHDOG (Feb. 13, 2014), [www.ipwatchdog.com/2014/02/13/supreme-court-abstract-idea-doctrine-is-unworkable/id=47980/perma.cc/X9RG-EX7Z](http://www.ipwatchdog.com/2014/02/13/supreme-court-abstract-idea-doctrine-is-unworkable/id=47980/perma.cc/X9RG-EX7Z)] (explaining that “[t]he true test for patentability should not rest on section 101” and that short-circuiting the entire patent law into section 101 analysis will only frustrate the constitutional purpose of a patent system).

315. See Zuckerman, *supra* note 272, at 444 (concluding that “the abstract idea doctrine is unworkable and produces unpredictable results” and that “eliminating the abstract idea doctrine by expanding the traditional interpretation of § 112(b) would further prevent inequity resulting from the unpredictable doctrine.”).

patent holder rather than deal with patent holders, for example, to obtain a license to make or use the patented product. Entities may reduce their investment in innovation out of uncertainty of getting adequate patent protection for their inventions and the high costs associated with defending their patents in the courts. Any reduction in innovation efforts only undermines the United States Constitution, which grants Congress plenary authority to promote the progress of science and useful arts.<sup>316</sup>

Accordingly, clarity is needed regarding what is an abstract idea and what is not. The judiciary should precisely define the contours of the abstract idea doctrine to ensure that it can be consistently applied by practitioners, examiners, and judges to determine subject matter eligibility. If the judiciary cannot precisely define the doctrine's contours, it should either adopt the dictionary definitions that an abstract concept linked to a physical structure cannot be an abstract idea or abandon the doctrine in favor of substantive patentability requirements already in existence.

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316. *See* U.S. CONST. art. I, § 8, cl. 8.