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An Inside History of the Burger Court's Patent Eligibility Jurisprudence

Christopher B. Seaman
Washington and Lee University School of Law, seamanc@wlu.edu

Sheena X. Wang
Washington and Lee University School of Law, wang.s21@law.wlu.edu

AN INSIDE HISTORY OF THE BURGER COURT'S PATENT ELIGIBILITY JURISPRUDENCE

Christopher B. Seaman* & Sheena X. Wang**

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ABSTRACT

Patent eligibility is one of the most important and controversial issues in intellectual property law. Although the relevant constitutional and statutory text is extremely broad, the Supreme Court has significantly narrowed the scope of patentable eligibility by creating exceptions for inventions directed to abstract ideas, laws of nature, and natural phenomenon. In particular, the Supreme Court's decisions on this issue over the past decade have created considerable uncertainty regarding the patentability of important innovations. As a result, numerous stakeholders have called for reform of the current rules regarding patent eligibility, and members of Congress have introduced legislation to amend the Patent Act to provide greater clarity.

The current quandary regarding patent eligibility is nothing new, however. In the 1970s and early 1980s, the Supreme Court was similarly challenged by inventors' attempts to obtain patent rights to a number of then-emerging technologies, including computer software and genetically-modified organisms. After initially concluding that processes consisting of or including an algorithm were not patentable subject matter in Gottschalk v. Benson *(1972) and* Parker v. Flook *(1978), the Court abruptly changed course in* Diamond v. Diehr *(1981), holding that the use*

of a computer program to implement a method for curing synthetic rubber was eligible for patenting. Similarly, in the life sciences, the Court overturned a USPTO decision rejecting a patent on a genetically-modified bacteria, concluding in Diamond v. Chakrabarty *(1980) that a non-naturally occurring organism was patent eligible. These decisions ultimately opened the door to thousands of patents covering computer software and biotechnology innovations. Moreover, they remain good law and are widely cited, including by the Court itself.*

To better understand these older patent eligibility decisions, this Article examines archival material from the chambers of Justice Lewis F. Powell, Jr., who was one of the "swing" votes on the Burger Court. Using this previously-untapped resource, we report several notable findings, including that the Court initially voted to find the process in Flook *to be patent eligible, only for two Justices to subsequently switch their votes. In addition, Justice Powell privately expressed the view that his vote in* Flook *was in error, ultimately changing sides in* Diehr *to adopt a more expansive view of patent eligibility. We also find evidence that the Justices and their clerks often struggled with the technological complexity of these new innovations in assessing their patentability, frequently commenting that Congress was better body for addressing such issues. We then offer several implications from these findings for the ongoing debate regarding the scope of patent eligibility.*

I.   INTRODUCTION

Patent eligibility[1]—what types of innovations can be patented—is one of the most significant and controversial issues in intellectual property law.[2] In the past decade, the Supreme Court has struck down patents and

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1.   This Article uses the phrases "patent eligible," "patent eligibility," and "patentable subject matter" interchangeably to refer to inventions that are eligible for patent protection under U.S. patent law. *See* Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 212 (2014) ("The question presented is whether these claims are patent eligible under 35 U.S.C. § 101 . . . ."); Parker v. Flook, 437 U.S. 584, 588 (1978) ("This case turns entirely on the proper construction of § 101 of the Patent Act, which describes the subject matter that is eligible for patent protection.").

2.   *See* John M. Golden, Flook *Says One Thing,* Diehr *Says Another: A Need for Housecleaning in the Law of Patentable Subject Matter*, 82 GEO. WASH. L. REV. 1765, 1765 (2014) ("Defining the bounds of patentable subject matter has become one of patent law's hottest issues."); Jake M. Sherkow, *The Natural Complexity of Patent Eligibility*, 99 IOWA L. REV. 1137, 1139 (2014) ("Recently, patents on human genes, software, and business methods have stoked a heated public discussion . . . . Much of that discussion has focused on the doctrine of patent eligibility, or patentable subject matter, a century-and-a-half old legal doctrine that limits the types of inventions that can be patented.").

patent applications for abstract ideas,[3] medical diagnostic tests,[4] genetic information in naturally-occurring DNA sequences,[5] and computer-implemented methods for facilitating financial transactions.[6] Following these precedents, lower federal courts have invalidated patents covering cybersecurity software,[7] search engine optimization,[8] voter verification systems,[9] and fetal DNA testing for genetic abnormalities.[10] And thousands of patent claims have been rejected at the U.S. Patent and Trademark Office (USPTO) and invalidated in litigation for lack of patentable subject matter.[11] As a result, patent eligibility remains unclear for a number of cutting-edge fields of technology, including artificial intelligence,[12] blockchain technology,[13] quantum computing,[14] and personalized medicine.[15]

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3. Bilski v. Kappos, 561 U.S. 593, 595 (2010).

4. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 92 (2012).

5. Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 576 (2013).

6. Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 212 (2014).

7. *See, e.g.*, Intellectual Ventures II LLC v. JP Morgan Chase & Co., No. 13-CV-3777(AKH), 2015 WL 1941331, at *1 (S.D.N.Y. Apr. 28, 2015); Glasswall Sols. Ltd. v. Clearswift Ltd., No. C16-1833 RAJ, 2017 WL 5882415, at *1 (W.D. Wash. Nov. 29, 2017), *aff'd*, 754 Fed. App'x 996 (Fed. Cir. 2018).

8. *See, e.g.*, BrightEdge Techs., Inc., v. Searchmetrics, GmbH, 304 F. Supp. 3d 859, 861 (N.D. Cal. 2018).

9. *See, e.g.*, Voter Verified, Inc. v. Election Sys. & Software LLC, 887 F.3d 1376, 1379 (Fed. Cir. 2018).

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

11. *See* Robert Sachs, Alice*: Benevolent Despot or Tyrant? Analyzing Five Years of Case Law Since* Alice v. CLS Bank*: Part I*, IPWATCHDOG (Aug. 29, 2019), https://www.ipwatchdog.com/2019/08/29/alice-benevolent-despot-or-tyrant-analyzing-five-years-of-case-law-since-alice-v-cls-bank-part-i/id=112722 [https://perma.cc/Z9R8-KVPK] ("Over 1,000 patents have been invalidated by federal courts and the . . . Patent Trial and Appeal Board . . . .").

12. *See generally* Mizuki Hashiguchi, *The Global Artificial Intelligence Revolution Challenges Patent Eligibility Laws*, 13 J. BUS. & TECH. L. 1 (2017).

13. *See generally* Gurneet Singh, *Are Internet-Implemented Applications of Block-Chain Technology Patent-Eligible in the United States?*, 17 CHI.-KENT J. INTELL. PROP. L. 356 (2018); Antonio M. DiNizo Jr., Note, *From* Alice *to Bob: The Patent Eligibility of Blockchain in a Post-*CLS Bank *World*, 9 CASE W. RES. J.L. TECH. & INTERNET 1 (2018).

14. *See* Matthew Fagan, *Quantum Computing Raises Problems For The Patent System*, IPLAW360 (Aug. 28, 2019), https://www.law360.com/articles/1077025/quantum-computing-raises-problems-for-the-patent-system [https://perma.cc/RQP7-MVJT].

15. *See* Rebecca Eisenberg, *Diagnostics Need Not Apply*, 21 B.U. J. SCI. & TECH. L. 256, 256 (2015); Christopher M. Holman*, Mayo, Myriad, and the Future of Innovation in Molecular Diagnostics and Personalized Medicine*, 15 N.C. J.L. & TECH. 639, 639 (2014); Rachel E. Sachs, *Innovation Law and Policy: Preserving the Future of Personalized Medicine*, 49 U.C. DAVIS L. REV. 1881, 1881 (2016).

In the wake of these developments, federal judges,[16] patent attorneys and owners,[17] leading academics,[18] and current and former Directors of the USPTO[19] have called for significant changes to the law governing patent eligibility. In response, Congress held hearings in 2019 to consider amending § 101 to bring greater clarity and certainty to the scope of patentable subject matter and its judicially created exceptions.[20]

Notably, this is not the first time the Supreme Court has attempted to address questions of patent eligibility in the face of new technologies. In the 1970s and early 1980s, the Burger Court sought to resolve whether inventions involving computer software could be patented. Initially, the

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16.   *See* Berkheimer v. HP Inc., 890 F.3d 1369, 1374 (Fed. Cir. 2018) (Lourie & Newman, JJ., concurring in denial of petition for rehearing en banc) ("I believe the law [regarding patent eligibility] needs clarification by higher authority, perhaps by Congress, to work its way out of what so many in the innovation field consider are § 101 problems."); Brief of the Honorable Paul R. Michel (Ret.) as Amicus Curiae in Support of Petitioners, Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC (No. 19-430) (Nov. 1, 2019) (calling for Supreme Court intervention to address existing doctrinal confusion regarding § 101).

17.   *See Joint IPO-AIPLA Proposal on Patent Eligibility*, AIPLA (May 2018), https://www.aipla.org/advocacy/legislative/joint-aipla-ipo-proposal-on-patent-eligibility [https://perma.cc/EU88-H7CP]; *see also AIPLA Legislative Proposal and Report on Patent Eligible Subject Matter*, AIPLA (May 12, 2017), https://www.aipla.org/docs/default-source/uploadedfiles/documents/resources2/reports/2017aipladirect/documents/aipla-report-on-101-reform-5-19-17-errata.pdf?sfvrsn=138c9ce7_1 [https://perma.cc/XG3M-UG9S].

18.   *See, e.g.*, Jeffrey A. Lefstin et al., *Final Report of the Berkeley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenges*, 33 BERKELEY TECH. L.J. 551, 592–600 (2018); David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149 (2017); Kristen Osenga, *Institutional Design for Innovation: A Radical Proposal for Addressing § 101 Patent-Eligible Subject Matter*, 68 AM. U. L. REV. 1191 (2019); *The State of Patent Eligibility in America: Part I: Hearing Before the Subcomm. on Intellectual Prop.*, *S. Comm. on the Judiciary*, 116th Cong. (June 4, 2019) (statement of Professor Adam Mossoff, Professor of Law, Antonin Scalia Law School George Mason University), https://www.judiciary.senate.gov/imo/media/doc/Mossoff%20Testimony.pdf [https://perma.cc/Y79U-KV5V].

19.   Ryan Davis, *Kappos Calls For Abolition Of Section 101 Of Patent Act*, LAW360 (Apr. 12, 2016), https://www.law360.com/articles/783604/kappos-calls-for-abolition-of-section-101-of-patent-act [https://perma.cc/64PJ-GTQL]; Andrei S. Iancu, *Remarks by Director Iancu at the 10th Annual Patent Law & Policy Conference*, USPTO (Nov. 26, 2018), https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-10th-annual-patent-law-policy-conference [https://perma.cc/MA3J-KMLS].

20.   *See The State of Patent Eligibility in America: Part I, Hearing Before the Subcomm. on Intellectual Prop.*, *S. Comm. on the Judiciary*, 116th Cong. (June 4, 2019), https://www.judiciary.senate.gov/meetings/the-state-of-patent-eligibility-in-america-part-i [https://perma.cc/SJB2-QH4D]; *The State of Patent Eligibility in America: Part II, Hearing Before the Subcomm. on Intellectual Prop.*, *S. Comm. on the Judiciary*, 116th Cong. (June 5, 2019), https://www.judiciary.senate.gov/meetings/the-state-of-patent-eligibility-in-america-part-ii [https://perma.cc/ND7A-8RVC]; *The State of Patent Eligibility in America: Part III, Hearing Before the Subcomm. on Intellectual Prop.*, *S. Comm. on the Judiciary*, 116th Cong. (June 11, 2019), https://www.judiciary.senate.gov/meetings/the-state-of-patent-eligibility-in-america-part-iii [https://perma.cc/M9DB-YRYE].

Court concluded in *Gottschalk v. Benson* (1972)[21] and *Parker v. Flook* (1978)[22] that processes where the claim's novelty relies upon an algorithm were not patent eligible unless the claim also amounted to an "inventive application" of that algorithm.[23] Just three years later, however, the Court abruptly reversed course, concluding in *Diamond v. Diehr* (1981),[24] which involved a superficially similar set of facts to *Flook*, that an industrial process incorporating a mathematical algorithm was indeed patentable subject matter.[25] And in an often-overlooked companion case to *Diehr* decided the same month, *Diamond v. Bradley* (1981), an equally-divided Court affirmed a lower court's decision that an invention for more efficiently storing information in a general-purpose computer was patent eligible, overturning the patent office's rejection of the claimed invention in light of *Benson* and *Flook*.[26]

The Burger Court also considered the patent eligibility of genetically-modified organisms (GMOs).[27] At the time, living organisms were widely viewed as unpatentable subject matter.[28] But in *Diamond v. Chakrabarty* (1980), the Court held 5–4 that a living, genetically-modified *Pseudonomas* bacteria was patent eligible as either a "manufacture" or "composition of matter" under § 101.[29] This decision is

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21. Gottschalk v. Benson, 409 U.S. 63, 71–72 (1972).

22. Parker v. Flook, 437 U.S. 584, 585–86 (1978).

23. *See id.* at 591 ("The process itself, not merely the mathematical algorithm, must be new and useful. Indeed, the novelty of the mathematical algorithm is not a determining factor at all. . . . [T]he algorithm . . . is treated as though it were a familiar part of the prior art.").

24. Diamond v. Diehr, 450 U.S. 175, 185–93 (1980).

25. *See* Kristen Osenga, *Ants, Elephant Guns, and Statutory Subject Matter*, 39 ARIZ. ST. L.J. 1087, 1096 (2007) ("Although the invention in *Diehr* looks, at least superficially, similar to *Flook*— data are measured, data are manipulated using a mathematical algorithm or formula, and the output of the algorithm is used from some industrial purpose—the outcome of the case was diametrically opposite."); *see also Diamond*, 450 U.S. at 209 (Stevens, J., dissenting) (noting that "th[e] method of updating the curing time calculation" at issue in *Diehr* "is strikingly reminiscent of the method of updating alarm limits that . . . Flook sought to patent.").

26. *In re* Bradley, 600 F.2d 807, 808 (C.C.P.A. 1979), *aff'd by an equally-divided court*, 450 U.S. 381, 381 (1981) (per curiam). Chief Justice Burger, who voted with the majority in *Diehr*, recused himself in *Bradley*.

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

28. *See* Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 YALE L.J. 177, 187 (1987) ("[P]rior to the Supreme Court's 1980 decision in *Diamond v. Chakrabarty*, patent protection for biological materials was retarded by the longstanding belief that living organisms and cells were unpatentable products of nature."). The then-leading Supreme Court case, *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948), held that a combination of naturally-occurring bacteria that were not mutually inhibiting in enabling nitrogen fixation in plants was a "product of nature" that was unpatentable subject matter.

29. *Diamond*, 447 U.S. at 312–18.

widely viewed as opening the door to the patenting of GMOs, which helped usher in the biotechnology revolution.[30]

Even though these decisions are now several decades old, they remain central to the issue of patent eligibility. As one study recently noted, the Burger Court's patent-eligibility jurisprudence "form[s] the backbone of the current § 101 analysis."[31] Indeed, the Court has taken pains in its more recent patent eligibility decisions to reconcile its holdings with these precedents, with varying degrees of success. In *Bilski v. Kappos* (2010), Justice Kennedy devoted an entire section of his opinion for the Court summarizing *Benson*, *Flook*, and *Diehr*, and then contended that, "in light of these precedents," Bilski's attempt to claim the concept of hedging amounted to "an unpatentable abstract idea, just like the algorithms at issue in *Benson* and *Flook*."[32] Similarly, Justice Breyer's opinion in *Mayo v. Prometheus* (2012) seemingly resurrected *Flook*'s "inventive concept" approach to patent eligibility, holding that the claimed method of determining the level of thiopurine drugs in a patient's bloodstream was unpatentable because it amounted to little more than a claim over a law of nature that lacked a patent-eligible application.[33]

To better understand the Court's reasoning in these older patent eligibility cases, we examined archival material from the chambers of Justice Lewis F. Powell, Jr., who was one of the "swing" votes on the Burger Court.[34] Justice Powell was a meticulous record keeper during his time on the Court, and his files for these cases contain a wealth of material, including bench memoranda from law clerks at the cert petition and merits stages, handwritten notes from oral argument and the Justices' conferences, and drafts of opinions and memoranda from the other

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30.   *See* Douglas Robinson & Nina Medlock, Diamond v. Chakrabarty*: A Retrospective on 25 Years of Biotech Patents*, 17 INTELL. PROP. & TECH. L.J. 12, 12 (2005) ("Chakrabarty has affected the lives of virtually everyone in the United States, having contributed to a revolution in biotechnology that has resulted in the issuance of thousands of patents, the formation of hundreds of new companies, and the development of thousands of bioengineered plants and food products.").

31.   Jeremy D. Roux, Note, *The Supreme Court and § 101 Jurisprudence: Reconciling Subject-Matter Patentability Standards and the Abstract Idea Exception*, 2014 U. ILL. L. REV. 629, 636–37 (2014).

32.   Bilski v. Kappos, 561 U.S. 593, 609–13 (2010). Justice Kennedy also referred to *Benson*, *Flook*, and *Diehr* as "guideposts" for determining "what constitutes a patentable 'process.'" *Id.* at 612.

33.   Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 72 (2012) (citing Parker v. Flook, 437 U.S. 584, 594 (1978)); *see also* Jeffrey A. Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565, 641 (2015) ("*Mayo*'s 'inventive concept' came directly from *Parker v. Flook*.").

34.   *See generally Lewis F. Powell, Jr. Archives*, WASHINGTON & LEE UNIV. SCH. OF LAW, https://law.wlu.edu/powell-archives [https://perma.cc/W9GS-4JDM].

Justices.[35] In sum, Justice Powell's case files help provide an inside view into the Burger Court's decision-making process regarding patent eligibility.

These archival materials reveal a number of previously unreported details regarding the Court's patentable subject matter decisions from the 1970s and early 1980s. First, the initial vote in *Parker v. Flook*—which represents the Burger Court's high water mark regarding the unpatentability of processes involving algorithms—was tentatively 5–4 to *affirm* the lower court, which found Flook's process to be patent eligible. However, in a memorandum circulated on the same day as the initial vote in conference, Justice Harry Blackmun changed his vote from "tentatively to affirm" to "tentatively to reverse." Then, after draft opinions for the majority and dissent had been circulated, Justice Byron White also switched his vote from affirm to reverse. Thus, *Flook* appears to have been a closer call than its final 6–3 vote suggests.

Second, Justice Powell later expressed the view that his decision in *Flook* was wrong, at least insofar as that case conflated issues of novelty and nonobviousness under §§ 102 and 103 with the patent eligibility inquiry under § 101. In a remarkably candid handwritten note on a bench memorandum in *Diehr* prepared by one of his law clerks, Justice Powell stated that the memorandum was "[p]ersuasive that my vote in *Flook* was [in] error."[36] And according to his own notes from the post-argument conference in *Diehr*, Justice Powell expressed his view to the other Justices that "[d]espite *Flook*, novelty should be irrelevant under § 101."[37] Ultimately, Justice Powell provided the key vote in *Diehr*, joining four other Justices to find the invention to be patent eligible, even though, like *Flook*, the claimed process included a specific algorithm.

Third, the archival materials reveal that the Justices and their law clerks were fully aware of the importance of the issue of patent eligibility and how it might shape the development of the nascent computer software and biotechnology industries, but often felt out of their depth when it came to understanding both the complexity of patent law and the intricacies of the technical details in these cases. As a result, members of the Court, including Justice Powell, repeatedly expressed the view both publicly and

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35.   For a description of the creation of the Powell Archive and nature of the written materials housed there from Justice Powell's time on the Supreme Court, see generally John N. Jacob, *The Lewis F. Powell, Jr. Archives and the Contemporary Researcher*, 49 WASH. & LEE L. REV. 3 (1992); John N. Jacob, *The Lewis F. Powell Jr. Archives at Washington and Lee University School of Law*, 17 TRENDS L. LIBR. MGMT. & TECH. 7 (2007).

36.   *See* authorities cited *infra* note 320 and accompanying text.

37.   *See Diehr* Case File, *infra* note 290, at 25.

privately that Congress ultimately was better suited to determine the scope of patent eligibility than the courts. This issue is mirrored in recent calls for Congress to amend § 101 to resolve the ongoing uncertainty about the scope of patent eligibility.

The remainder of this Article proceeds as follows. Part II provides background regarding the historical development of patent eligibility in the United States, including the relevant constitutional and statutory provisions and key Supreme Court precedents prior to the Burger Court. Part III contains an in-depth examination of the Burger Court's patent eligibility cases: *Gottschalk v. Benson*, *Parker v. Flook*, *Diamond v. Chakrabarty*, *Diamond v. Diehr*, and *Diamond v. Bradley*. Part IV examines the continued development of patent eligibility jurisprudence since these decisions, with a particular focus on how the current case law regarding patent eligibility heavily relies on the Burger Court's precedents. Part V offers several implications from our findings, particularly as they relate to the ongoing debate regarding proposed reforms to the scope of patentable subject matter. Part VI concludes.

II. BACKGROUND

To set the stage for the remainder of the Article, this Part summarizes the development of patent eligibility jurisprudence in the United States prior to the Burger Court. It first describes the relevant constitutional and statutory text and their history. It then recounts some prominent Supreme Court decisions regarding the scope of and limits to patent eligibility prior to *Benson*.

A.   The Constitution's IP Clause

The text of the Intellectual Property (IP) Clause[38] of the Constitution provides that Congress shall have the power "[t]o 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."[39] As other intellectual property scholars have noted, the language of this clause is unique in Article I because it not only grants Congress express authority to legislate, but it also appears to constrain how that authority can be exercised.[40] The Supreme Court has adopted a

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38.   This clause is sometimes also called the "Patent and Copyright Clause."

39.   U.S. CONST. art. I, cl. 8, § 8.

40.   *See* Dotan Oliar, *Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power*, 94 GEO. L.J. 1771, 1774 (2006) ("[T]he structure of the [Intellectual Property] Clause is unique . . . . Whereas the other enumerated powers

similar understanding, noting the Clause "is both a grant of power and a limitation" on Congress's legislative power, and explaining that Congress "may not overreach the restraints imposed by the stated constitutional purpose"—i.e., "the promotion of advances in the 'useful arts.'"[41]

Interestingly, during the Constitutional Convention, James Madison initially proposed a version of the IP Clause that would have limited patents to "useful machines and implements."[42] A competing proposal by James Pickney was broader in scope, authorizing Congress "[t]o grant patents for useful inventions," without any limitation as to the categories of "inventions" eligible for patenting.[43] Both proposals were referred to a committee, which recommended the language that presently appears in the Constitution, and this language was unanimously adopted without any recorded debate.[44]

B.   *Statutory Text and History*

The current version of § 101 provides that an inventor may obtain a patent for "any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof."[45] "[N]o patent is available for a discovery . . . unless it falls into one of the[se] express categories of patentable subject matter . . . ."[46] These categories are merely a starting point for the patentability analysis, however. First, in a line of decisions dating back to the 19th century, the Supreme Court has recognized three exceptions to patent eligibility: "laws of nature, physical phenomena, and abstract ideas."[47] Second, the patent applicant must also satisfy the other requirements of the Patent Act,

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generally consist of 'to' (or ends) clauses that demarcate areas of legitimate federal regulation . . . Congress's intellectual property power contains, in addition to the 'to' clause, a 'by' (or means) clause."); Edward C. Walterscheid, *Conforming the General Welfare Clause and the Intellectual Property Clause*, 13 HARV. J.L. & TECH. 87, 90 (1999) ("The intellectual property clause is unique among the constitutional powers granted to Congress in that it is the only one that sets forth a particular and specific mode of exercising the power.").

    41.   Graham v. John Deere Co., 383 U.S. 1, 5–6 (1966); *see also* Eldred v. Ashcroft, 537 U.S. 186, 223 (2003) (Stevens, J., dissenting) (quoting *Graham*, 383 U.S. at 5–6).

    42.   Oliar, *supra* note 40, at 1789.

    43.   *Id.*

    44.   *Id.* at 1790.

    45.   35 U.S.C. § 101 (2018). The idea of statutory classes of patentable subject matter can be traced as far back in legal history as the English Statute of Monopolies of 1623, which granted a 14-year "privilege" for "new manufactures." *See* 1 DONALD S. CHISUM, CHISUM ON PATENTS § 1.01 (2019).

    46.   Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 483 (1974).

    47.   Bilski v. Kappos, 561 U.S. 593, 601 (2010) (quoting Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980)).

including novelty (§ 102), nonobviousness (§ 103) and adequate disclosure of the invention (§ 112).[48]

The statutory text regarding patentability has remained largely unchanged since the 1793 Patent Act, which provided that "any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement [thereof]," was eligible for patent protection.[49] The 1952 Patent Act substituted "process" for "art,"[50] and further defined "process" as a "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."[51] The legislative history suggests that this change was not intended to alter the scope of patent eligibility.[52] P.J. Federico, one of the drafters of the 1952 Patent Act, explained that courts had used the word "art" as "practically synonymous with process or method," and the switch in terminology was intended to avoid potential confusion.[53]

The legislative history of the 1952 Patent Act also includes an oft-quoted phrase regarding patent eligibility: "anything under the sun that is made by man."[54] This language was first cited by the Court of Claims and Patent Appeals almost three decades later in an opinion by Judge Giles Rich—who played a leading role in drafting the 1952 Patent Act—holding that two patent applications involving living organisms (bacteria) were patent eligible.[55] It was then repeated, in isolation, by the Supreme Court

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48.   *See* 35 U.S.C. § 101 (2018) (stating that the application is "subject to the conditions and requirements of this title"); *see also Bilski*, 561 U.S. at 621 (Stevens, J., concurring in the judgment) (explaining that this language includes the requirement that "the patent also be novel, § 102, and nonobvious, § 103").

49.   Patent Act of 1793, Ch. 11, 1 Stat. 318–23, § 1 (1793).

50.   1952 Patent Act § 101, Pub. L. No. 82-593, 66 Stat. 792 (1952); *see also Chakrabarty*, 447 U.S. at 308–09. The 1930 Plant Patent Act added new asexually reproducing plants to the statutory categories of patent eligibility. *See* Pub. L. No. 71-312, 46 Stat. 367 (1930). This language was moved to another section in the 1952 Patent Act. *See* 35 U.S.C. § 161 (2018).

51.   35 U.S.C. § 100(b) (2018).

52.   The Senate and House Committee Reports explain that the word "process" was adopted to avoid potential confusion and ambiguity, as the word "art" has a different meaning in the IP Clause ("useful art") and other places in the U.S. Code. *See* S. REP. NO. 82-1979, at 5 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2398–99 ("[T]he word 'art' which appears in the present statute has been changed to the word 'process.' Art . . . in the present statute has a different meaning than the words 'useful art' in the Constitution, and a different meaning than the use of the word 'art' in other places in the statutes, and it is interpreted by the courts to be practically synonymous with process or method. The word 'process' has been used to avoid the necessity of explanation that the word 'art' as used in this place means 'process or method,' and that it does not mean the same thing as the word 'art' in other places.").

53.   P.J. Federico, *Commentary on the New Patent Act*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 176–77 (1994).

54.   H.R. REP. NO. 82-1923, at 6 (1952); S. REP. NO. 82-1979, at 6 (1952).

55.   *In re* Bergy, 596 F.2d 952, 955 (C.C.P.A. 1979). Notably, even Judge Rich did not believe § 101 extended to all innovations and improvements created by humans. *See* Giles S. Rich, *The*

in *Chakrabarty*,[56] and then again the following year in *Diehr*.[57] Since then, this language has been quoted over 50 times by lower federal courts. But the full passage as it appears in the original House and Senate committee reports for the 1952 Patent Act suggest the scope of patent eligibility is not so broad as some have read it.[58] The fourth and final paragraph of the relevant section states: "A person may have 'invented' a machine or manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable under 101 unless the conditions of the title are fulfilled."[59]

Several things are apparent when the "anything under the sun" language is read in context. One, the quoted language refers only to the statutory classes of "machine" or "manufacture." It does not apply to "process" or "composition of matter"—and the former is particularly important, as most of the Court's patent eligibility decisions involve process claims.[60] Two, the final clause makes clear that any machine or manufacture (like all inventions) must satisfy the other statutory requirements for patentability, including novelty, nonobviousness, and adequate disclosure.[61] As a result, the scope of statutory patent eligibility clearly falls short of literally *anything* developed by humans.[62]

Principles of Patentability, 32 GEO. WASH. L. REV. 393, 393–94 (1960) ("Section 101 . . . enumerates the categories of inventions subject to patenting. Of course, not every kind of invention can be patented. Invaluable though it may be to individuals, the public, and the national defense, the invention of a more effective organization of the materials in, and the techniques of teaching a course in physics, chemistry, or Russian is not a patentable invention because it is outside the enumerated [statutory] categories . . . . Also outside that group is one of the greatest inventions of our time, the diaper service.").

  56.   Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980).
  57.   Diamond v. Diehr, 450 U.S. 175, 182 (1981).
  58.   *See* Brief Amici Curiae of Professors Peter S. Menell and Michael J. Meurer in Support of Respondent, Bilski v. Kappos, 561 U.S. 593 (2010), 2009 WL 3199629, at *22 ("[R]ead in context, the 'anything under the sun' snippet does not stand for the proposition that Congress intended the broadest possible scope of patentable subject matter.").
  59.   H.R. REP. NO. 82-1923, at 6; S. REP. NO. 82-1979, at 6.
  60.   This is reinforced by the fact that two paragraphs earlier, the committee reports separately explain the definition of "process" in the 1952 Patent Act. *See generally* Timothy R. Holbrook, *Patent Method Exceptionalism*, 102 IOWA L. REV. 1001 (2017) (summarizing the law's treatment of process patents).
  61.   H.R. REP. NO. 82-1923, at 6; S. REP. NO. 82-1979, at 6; *see also* David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 172–73 (2016) ("In this way, the Senate and House Reports explain that . . . . for a patent to be issued, the inventor must comply not only with the patentability requirements of § 101, but also with the patentability requirements of §§ 102 and 103.").
  62.   *See* Bilski v. Kappos, 561 U.S. 593, 642 (2010) (Stevens, J., concurring) ("Viewed as a whole, it seems clear that this language does not purport to explain that 'anything under the sun' is patentable. Indeed, the language may be understood to state the exact opposite: that '[a] person may have invented . . . anything under the sun,' but that thing is not necessarily patentable under section 101.").

The most recent major amendment to the Patent Act, the Leahy-Smith America Invents Act (AIA),[63] added two narrow exceptions that impact patent eligibility. First, it limited patent protection for tax avoidance strategies, which had previously been criticized by both IP and tax scholars,[64] by declaring them to be within the scope of the prior art.[65] Second, it provided that "no patent may issue on a claim directed to or encompassing a human organism."[66] Section 101 itself, however, remained unchanged.

C. Supreme Court Patent Eligibility Decisions Prior to the Burger Court

The first U.S. Supreme Court decision regarding patent eligibility is *Le Roy v. Tatham* (1852).[67] The patent at issue in that case claimed and described an improved method for manufacturing metal pipes. Regarding patent eligibility, the Court explained:

> [A] principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right. Nor can an exclusive right exist to a new power, should one be discovered in addition to those already known. Through the agency of machinery a new steam power may be said to have been generated. But no one can appropriate this power exclusively to himself, under the patent laws. The

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63. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) [hereinafter AIA].

64. *See, e.g.*, Christopher A. Cotropia & James Gibson, *The Upside of Intellectual Property's Downside*, 57 UCLA L. REV. 921, 940–51 (2010); Wade M. Chumney et al., *Patents Gone Wild: An Ethical Examination and Legal Analysis of Tax-Related and Tax Strategy Patents*, 46 AM. BUS. L.J. 343 (2009); Richard S. Gruner, *When Worlds Collide: Tax Planning Method Patents Meet Tax Practice Making Attorneys the Latest Patent Infringers*, 2008 U. ILL. J.L. TECH. & POL'Y 33 (2008); Brant J. Hellwig, *Questioning the Wisdom of Patent Protection for Tax Planning*, 26 VA. TAX REV. 1005 (2007); Katherine J. Strandburg, *What if There Were a Business Method Use Exemption to Patent Infringement?*, 2008 MICH. ST. L. REV. 245 (2008).

65. *Id.* § 14. The AIA limited patenting of tax avoidance strategies in a convoluted way; rather than directly amending § 101 to declare them ineligible for patent protection, it instead provided that such patents "shall be deemed insufficient to differentiate a claimed invention from the prior art." *Id.* § 14(a). It also did not preclude the patenting of "a method, apparatus, technology, computer program, product, or system" for preparing or filing a tax return, or if "used solely for financial management." *Id.* § 14(c).

66. AIA § 33(a). The exception appears to be intended to codify USPTO policy to prohibit the patenting of human embryos, human-animal chimeras, and human clones. *See generally* Yaniv Heled, *On Patenting Human Organisms Or How the Abortion Wars Feed into the Ownership Fallacy*, 36 CARDOZO L. REV. 241 (2014); Ava Caffarini, Comment, *Directed to or Encompassing a Human Organism: How Section 33 of the America Invents Act May Threaten the Future of Biotechnology*, 12 J. MARSHALL REV. INTELL. PROP. L. 768 (2013).

67. Le Roy v. Tatham, 55 U.S. (14 How.) 156 (1852).

> same may be said of electricity, and of any other power in nature, which
> is alike open to all, and may be applied to useful purposes by the use of
> machinery.
>
> In all such cases, the processes used to extract, modify, and concentrate
> natural agencies, constitute the invention. The elements of the power
> exist; the invention is not in discovering them, but in applying them to
> useful objects.[68]

This statement, though dicta, has resonated through the years, having been
cited by the Court in modern patent eligibility decisions.[69]

The following year, the Supreme Court addressed the patentability
of Samuel Morse's electromagnetic telegraph in *O'Reilly v. Morse*.[70]
While the first seven claims of Morse's patent were upheld, the Court held
that claim eight was unpatentable. This claim, which was sweeping in
scope, stated:

> I do not propose to limit myself to the specific machinery or parts of
> machinery described in the foregoing specification and claims; the
> essence of my invention being the use of the motive power of the electric
> or galvanic current, which I call electro-magnetism, however developed
> for marking or printing intelligible characters, signs, or letters, at any
> distances, being a new application of that power of which I claim to be
> the first inventor or discoverer.[71]

The Court held that this claim was unpatentable because it went far
beyond what Morse had actually invented or discovered, by seeking to
claim "the exclusive right to every improvement where the motive power
is the electric or galvanic current, and the result is the marking or printing
intelligible characters, signs, or letters at a distance."[72] It expressed
concern that upholding such a broad, unsupported right to exclude could
preempt work by other inventors who "may discover a mode of writing or
printing at a distance by means of the electric or galvanic current, without

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68. *Id.* at 175.

69. *See* Alan J. Heinrich & Christopher T. Abernethy, *The* Myriad *Reasons to Hit "Reset" on
Patent-Eligibility Jurisprudence*, 47 LOYOLA L.A. L. REV. 117, 133 (2013) (calling this language
"sweeping dicta"); Paxton M. Lewis, Note, *The Conflation of Patent Eligibility and Obviousness:
Alice's Substitution of Section 103*, 2017 UTAH L. REV. ONLAW 13, 16–17 ("*Le Roy*'s famous quote
is often viewed as the holding of the case, but it is simply dicta in a case where the Court chose to
ignore the patent eligibility issue and focus on novelty . . . ."); Harold C. Wegner, *Cabining The 800
Pound* Faux Stare Decisis *Gorilla in the Room of Patent Eligibility*, LAIPLA (Nov. 23, 2016),
http://www.laipla.net/wp-content/uploads/2016/11/PatentEligibilityNov23.pdf
[https://perma.cc/GNX7-3SAW].

70. O'Reilly v. Morse, 56 U.S. (15 How.) 62 (1853).

71. *Id.* at 112.

72. *Id.*

using any part of the process or combination set forth in the plaintiff's specification."[73] Ultimately, the Court rejected claim eight.[74]

In *Tilghman v. Proctor* (1881),[75] the patentee claimed a process of separating fat into its component parts by subjecting it to extreme heat under pressure.[76] The Court held the invention was patent eligible, stating:

> That a patent can be granted for a process, there can be no doubt. The patent law is not confined to new machines and new compositions of matter, but extends to any new and useful art or manufacture. A manufacturing process is clearly an art, within the meaning of the law.[77]

This holding, standing alone, is "fairly unremarkable"[78]—the claim covered an industrial process of the sort that has been widely patented both before and since *Tilghman.* But the Court continued on, distinguishing the patent-in-suit from Morse's claim eight on the grounds that the latter was unpatentable

> because it was regarded by the court as being not for a process, but for a mere principle. It amounted to . . . a claim of the exclusive use of one of the powers of nature for a particular purpose. It was not a claim of any particular machinery, nor a claim of any particular process for utilizing the power; but a claim of the power itself . . . .[79]

Over 50 years later, the Court reiterated that fundamental scientific principles, standing alone, are not patent eligible. In *Mackay Radio & Telegraph Corp. v. Radio Corp. of America* (1939),[80] the patentee claimed an antenna configuration for the transmission of radio waves.[81] At the time, it was widely known that a particular equation called Abraham's formula could predict the angle of radio activity from a charged wire of a fixed length.[82] The claimed invention used Abraham's formula to

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73.   *Id.* at 113; *see generally* DAVID CROWLEY, COMMUNICATIONS IN HISTORY (Peter Urquhart & Paul Heyer, eds., 7th ed. 2018).

74.   *See* Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 71 (2012) (citing *O'Reilly* as support for the statement that "laws of nature, natural phenomena, and abstract ideas are not patentable"); Lab. Corp. of Am. v. Metabolite Labs., Inc., 548 U.S. 124, 126 (Breyer, J., dissenting) (citing *O'Reilly* as support for the statement that "[t]he relevant principle of law excludes from patent protection laws of nature, natural phenomena, and abstract ideas" (internal quotations, ellipses, and brackets omitted)).

75.   Tilghman v. Proctor, 102 U.S. 707 (1881).

76.   *Id.* at 708.

77.   *Id.* at 722.

78.   Heinrich & Abernethy, *supra* note 69, at 139.

79.   *Tilghman*, 102 U.S. at 726–27.

80.   Mackay Radio & Tel. Corp. v. Radio Corp. of Am., 306 U.S. 86 (1939).

81.   *Id.* at 88.

82.   *Id.* at 93–94.

determine the angle of the V-shaped wires in the antenna.[83] The Court held that the invention was patent eligible, stating that "[w]hile a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."[84]

Nearly a decade later, the Court struck down a patent on eligibility grounds for (possibly) the first time since *Morse* almost a century prior. In *Funk Bros. v. Kalo Inoculant Co.* (1948),[85] the patentee claimed to have discovered that a combination of certain strains of root-nodule bacteria did not mutually inhibit the absorption of nitrogen in leguminous plants, and thus could be used together in a single mixture for numerous species.[86] The Supreme Court held that this combination of bacteria, by itself, was not patent eligible because "[t]heir qualities are the work of nature."[87] It explained:

> The qualities of these bacteria, like the heat of the sun, electricity, or the qualities of metals, are part of the storehouse of knowledge of all men. They are manifestations of laws of nature, free to all men and reserved exclusively to none. He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end.[88]

In the majority's view, the patentee had merely discovered a naturally-occurring attribute of the claimed bacteria and then combined them into a single product.[89] The individual strains of bacteria were unchanged and "perform in their natural way," and the combination of strains "does not improve in any their natural functioning. They serve the ends nature originally provided and act quite independently of any effort of the patentee."[90] As a result, even though the combination of bacteria was admittedly useful and apparently novel, it was "no more than the discovery of some of the handiwork of nature and hence is not patentable."[91]

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83. *Id.*
84. *Id.* at 94.
85. Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948).
86. *Id.* at 128–30.
87. *Id.* at 130.
88. *Id.*
89. *Id.* at 131.
90. *Id.*
91. *Id.*

III. A DEEP DIVE INTO THE BURGER COURT'S
PATENT ELIGIBILITY DECISIONS

This Part discusses in depth the main patent eligibility decisions of the Burger Court (1969–1986)—namely, *Gottschalk v. Benson*, *Parker v. Flook, Diamond v. Chakrabarty*, and *Diamond v. Diehr*. It also covers *Diamond v. Bradley*, a lesser-known companion case to *Diehr* often overlooked by both courts and scholars. For each of these cases, the information available from the public record is supplemented by archival material from the hitherto-unused case files of Justice Lewis Powell.

The Burger Court era is important for the development of modern patent eligibility jurisprudence for several reasons. First, these cases comprehensively discuss and apply the judicially created exceptions to patentable subject matter: laws of nature, natural phenomena, and abstract ideas. Second, they address—with conflicting reasoning—the relationship between patent eligibility and the other requirements for patentability such as novelty and nonobviousness, an issue which continues to be controversial. Third, the *Flook* case in particular has been relied on as support for the current requirement in cases like *Mayo* and *Alice* that there must be an inventive application of one of the judicially created exceptions to patentability.[92]

Each case is discussed in chronological order below, starting with a summary of the claimed invention and the procedural history prior to reaching the Supreme Court. Then it addresses the Court's internal deliberations and decision-making process at both the cert petition and merits stages, based upon both publicly available materials and Justice Powell's archival records. Finally, it concludes with a summary of the Court's decision in each case, including any concurring and dissenting opinions.

A.   Gottschalk v. Benson

1.   Facts and Procedural History

In 1963, Gary Benson and Arthur Tabbot filed a patent application for a process that converted one type of binary code to another through the use of a computer program.[93] The patent examiner rejected the claims as unpatentable under § 101, explaining that the claimed invention did not

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92.   *See* Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 222 (2014); Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 71–73 (2012).

93.   Gottschalk v. Benson, 409 U.S. 63, 68 (1972).

constitute a "process."[94] The Board of Patent Appeals and Interferences (BPAI)[95] affirmed the examiner's rejection in 1968, basing its decision on the USPTO's consistent practice that computer programs were not patentable subject matter under § 101.[96]

Benson appealed to the Court of Customs and Patent Appeals (CCPA),[97] which in 1971 reversed and found the claim patentable.[98] The CCPA distinguished *Benson* from previous computer software cases because "[t]he claims in this case are directed solely to the art of data-processing itself whereas in [the previous] cases some subsidiary or additional art was involved."[99]

2. Petition for Writ of Certiorari

The USPTO filed a petition for a writ of certiorari to the Supreme Court, which was granted in 1972.[100] According to a bench memorandum from Justice Powell's law clerk, the USPTO sought review of the CCPA's decision because it had deviated from the USPTO's consistent practice of denying patents for computer programs.[101] Historically, the courts had considered computer programs to be "mental processes," which were not patentable.[102] The Solicitor General contended that mental processes were not patent eligible because they were "basic instruments of scientific and technological development and, their free exchange [wa]s, therefore, not to be hindered by the granting of patent monopolies."[103] As summarized in the law clerk's memorandum, the USPTO also offered numerous policy

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94.   *In re* Benson, 441 F.2d 682, 684 (C.C.P.A. 1971).

95.   The Board of Patent Appeals and Inferences (BPAI) was an administrative court within the PTO that heard appeals from adverse examiner decisions regarding patent applications. *See* 35 U.S.C. § 6(b) (2006) (amended 2012). Under the Leahy-Smith America Invents Act, the BPAI was replaced with the Patent Trial and Appeal Board (PTAB) effective September 16, 2012. AIA § 7, Pub. L. No. 112-29, 125 Stat. 284, 313 (codified at 35 U.S.C. § 6(a)).

96.   *In re Benson*, 441 F.2d at 686.

97.   The Court of Customs and Patent Appeals (CCPA) was a federal court that had jurisdiction over appeals regarding USPTO decisions on patent applications. The CCPA was abolished in 1982, and its jurisdiction, judges, and docket were transferred to the United States Court of Appeals for the Federal Circuit. *See* Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25, 36–38 (codified at 28 U.S.C. § 1295).

98.   *In re Benson*, 441 F.2d at 688.

99.   *Id.* at 686.

100.   Gottschalk v. Benson*, 405 U.S. 915, 915 (1972).

101.   *See* Supreme Court Case File, Gottschalk v. Benson, No. 71-485 (1972), *in* Lewis F. Powell, Jr. Archive, Box 375/Folder 28 [hereinafter *Benson* Case File], https://scholarlycommons.law.wlu.edu/casefiles/644/ [https://perma.cc/WK32-55TF].

102.   *Guidelines to Examination of Programs*, 829 OFF. GAZ. PAT. OFFICE 1, 1 (1966).

103.   Memorandum on Patentability of Computer Programs, Gottschalk v. Benson (No. 71-485), at 2, in *Benson* Case File, *supra* note 101, at 3.

reasons for denying patents to computer programs, including that patent rights would "impede the future growth of the computer software business due to the lack of free interchange of ideas"; that "patent infringement suits can be anticipated . . . to [create] confusion and impose additional costs"; that "[t]he computer program industry grew phenomenally without the protection of patent monopolies and it is relatively clear that the monopoly incentive is not necessary to assure maximum industry development"; and that "any change in the status quo should have come from Congress in the form of legislation rather than by change of statutory interpretation by the CCPA."[104]

Benson, the patent applicant, responded that (1) if an inventor is able to meet the requirements for patentability, he should be given the same statutory protection as any other industry; (2) there will not be thousands of applications and lawsuits because it will be difficult for most programs to fulfil all of the requirements for patentability; and (3) "the decision is not a departure from prior law."[105]

In handwritten comments on a bench memorandum regarding certiorari, Justice Powell noted that there was "[n]o controlling case law" on this issue."[106] He indicated that he agreed with the USPTO's position that patents should not be granted for computer software "unless they serve some purpose to protect the growth of the industry."[107] He further agreed with his clerk's assessment that the Court was not "best equipped to handle this problem. Resolution of the policy issues could best be handled by Congress where their broad fact-gathering processes will allow full consideration to the myriad technological facts, historical data, and predictions for the future of the industry." However, Justice Powell commented that it will be hard for a new bill concerning this matter to get through Congress without an "organized premise."[108]

Ultimately, Justice Powell was "inclined to agree with" his clerk's assessment that certiorari should not be granted because the "issue is too complex for Court to decide," and instead "Congress should clarify [the] law."[109] However, he also indicated that "cert. should be granted [and] [the CCPA] reversed if the record supports [the] view that a 'computer program' is not a 'process within meaning of statute.'"[110] Subsequently,

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104.   *Id*. at 3.
105.   *Id.* at 4.
106.   *Id.* at 2 (handwritten notes of Justice Powell).
107.   *Id.* at 4.
108.   *Id.* (handwritten notes of Justice Powell).
109.   *Id.* at 1 (handwritten notes of Justice Powell).
110.   *Id*. (handwritten notes of Justice Powell).

in an undated memo, Justice Powell indicated that he would recuse himself from *Benson*, as he owned stock in IBM, which had filed an amicus brief in support of the USPTO's position.[111]

At a conference on February 18, 1972, the Court took a preliminary vote to determine whether to grant certiorari.[112] Justices Blackmun, White, and Douglas voted to grant the petition; Justices Rehnquist and Marshall voted to deny the petition; and Justices Stewart, Brennan, Powell and Chief Justice Burger passed on deciding the petition at this point.[113] On February 22, 1972, the Court granted the writ of certiorari.[114] The order granting certiorari indicated that Justices Blackmun, Powell, and Stewart did not participate in the decision.[115]

3. Supreme Court Decision

On November 20, 1972, the participating Justices unanimously reversed the CCPA, holding that Benson's invention was not patent-eligible subject matter under § 101.[116] Writing for the Court, Justice Douglas explained that the claimed process was a series of steps that could be performed solely in the mind, without the need for use of a computer.[117] Citing *Le Roy*, *Morse*, *Mackay Radio*, and *Funk Brothers* as support, the Court reasoned that "one may not patent an idea. But in practical effect that would be the result if [the claimed process] were patented" because the algorithm "has no substantial practical application except in connection with a digital computer."[118] As a result, "the patent would wholly pre-empt the mathematical formula and in practical effect be a patent on the algorithm itself," which was impermissible.[119] However, the Court also appeared to leave the door open for patents where algorithms

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111. Memorandum to Justice Lewis F. Powell, Jr., Gottschalk v. Benson (No. 71-485) (handwritten note of Justice Powell), *in Benson* Case File, *supra* note 101, at 6; *see also* Brief for Amicus Curiae International Business Machines Corp., Gottschalk v. Benson, 405 U.S. 915 (1972) (No. 71-485), 1972 WL 136233. As a result of Justice Powell's recusal from this case, the *Benson* Case File, *supra* note 101, was quite short.

112. Certiorari Vote Tally Sheet, Gottschalk v. Benson (No. 71-485), *in Benson* Case File, *supra* note 101, at 9.

113. *Id.* Justice Powell's handwritten notes on this document state that he "took no part" in the certiorari decision. *Id.* (handwritten notes of Justice Powell).

114. Gottschalk v. Benson, 405 U.S. 915, 915 (1972).

115. *Id.*

116. Gottschalk v. Benson, 409 U.S. 63, 72–73 (1972).

117. *Id.* at 67–68.

118. *Id.* at 71.

119. *Id.* at 72.

were used in combination with "a particular machine or apparatus," or were used to "change articles or materials to a 'different state or thing.'"[120]

The Court's opinion also echoed some of Justice Powell's thoughts regarding the desirability of legislative action, stating that "[i]t may be that the patent laws should be extended to cover [computer] programs," and noting the power of Congress to hold hearings and solicit a variety of viewpoints regarding this issue.[121] But this was ultimately "a policy mater to which [the Court] [is] not competent to speak."[122]

B.   Parker v. Flook

1.   Facts and Procedural History

While *Benson* was pending, Dale Flook, an employee of the oil company Atlantic Richfield Company, filed a patent application for a "Method for Updating Alarm Limits."[123] In this process, an alarm limit—a number that indicates the presence of an abnormal condition—for a catalytic conversion is periodically recalculated based on updated variables such as temperature and time.[124] For example, if a catalytic converter was operating within these calculated limits, then it was operating normally.[125] When the calculated value falls outside of the alarm limit, then an alarm will be sounded.[126] The applicant conceded that the only novel feature of the claimed method is the mathematical formula used.[127]

Initially, the examiner rejected Flook's application under § 101 because "while the claimed invention is clearly a method useful within the technological arts, the only part of [the] claimed invention which is not conventional is the particular algorithm used to adjust the alarm value."[128] The examiner's decision relied on *In re Christensen*, a CCPA decision issued shortly after *Benson*, which held that a process to determine the porosity of a subsurface formation was unpatentable because the mathematical formula in the profess was the sole point of novelty.[129] Based on *Christensen*, the examiner concluded that Flook's

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120.   *Id.* at 71.
121.   *Id.* at 72–73.
122.   *Id.* at 72.
123.   Parker v. Flook, 437 U.S. 584, 585 (1978).
124.   *Id.* at 585.
125.   *Id.* at 586.
126.   *Id.*
127.   *Id.* at 585.
128.   *In re* Flook, 559 F.2d 21, 22 (C.C.P.A. 1977).
129.   *In re* Christensen, 478 F.2d 1392, 1394–95 (C.C.P.A. 1973).

process was "not statutory subject matter . . . notwithstanding the fact that [it is] within the technological arts."[130]

Flook appealed this rejection to the BPAI, arguing the "express language in *Christensen* limited the holding in that case to claims in which the solution of the novel equation [wa]s the last step of a claimed process."[131] The BPAI rejected Flook's "last step" interpretation and agreed with the examiner's decision to deny the patent.[132] Flook then appealed to the CCPA, which reversed the BPAI's rejection.[133] The CCPA distinguished this case from *Benson* because "[t]he present claims do not preempt the formula or algorithm contained therein, because solution of the algorithm, per se, would not infringe the claims."[134]

2. Petition for Writ of Certiorari

On November 2, 1977, the USPTO filed a petition for a writ of certiorari.[135] The USPTO argued that the CCPA's decision to reverse the examiner's rejection under § 101 relied on a strained interpretation of *Benson*.[136] It also asserted that the CCPA's decision conflicted with *Funk Brothers* because the only point of novelty—the algorithm—was an unpatentable idea or scientific principle.[137] Furthermore, it claimed that the CCPA's decision "will have a debilitating effect on the rapidly expanding computer 'software' industry, and will require [the USPTO] to process thousands of additional patent applications."[138] The Solicitor General urged the Supreme Court to grant certiorari in this case because *Benson* needed to be clarified in light of confusion in the lower courts and uncertainty about how to apply its holding.[139] In addition, the Solicitor General argued that a clearer ruling would be beneficial for the computer industry.[140]

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130.   *In re Flook*, 559 F.2d at 22.

131.   *Id.*

132.   *Id.*

133.   *Id.* at 23 (citing Gottschalk v. Benson, 409 U.S. 63, 72 (1972)).

134.   *Id.*

135.   Brief for Petitioner, Parker v. Flook, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636, at *1–2 (noting the filing date of the cert petition in *Flook*).

136.   *See* Supreme Court Case File, Parker v. Flook, No. 77-642 (1978), *in* Lewis F. Powell, Jr. Archive,   Box   488/Folder   15–17   [hereinafter   *Flook*   Case   File], https://scholarlycommons.law.wlu.edu/casefiles/645 [https://perma.cc/MBF6-6HDF].

137.   Brief for Petitioner, *supra* note 135, at *19–20.

138.   Parker v. Flook, 437 U.S. 584, 587–88 (1978).

139.   Preliminary Memorandum, Parker v. Flook (No. 77-642), at 1 (Jan. 13, 1978), *in Flook* Case File, *supra* note 136, at 2.

140.   *Id.*

On January 4, 1978, the cert pool clerk[141] circulated a memorandum regarding the petition.[142] After summarizing the facts, procedural history, and the parties' arguments regarding certiorari, the memorandum contended that Flook's claim was distinguishable from *Benson* and implied that certiorari should be denied, stating:

> The [Solicitor General] is reading much more into *Benson* that is there. The Court was primarily concerned with the almost limitless scope of a patent involving a mathematical formula that was not tied to any specified end-use. That problem is, of course, not present here. I do not see in *Benson* any requirement that "the process be carried out with a specific apparatus devised to implement the newly-discovered idea." . . . [T]he Court strongly indicated in *Benson* its belief that Congress was the superior institution to resolve the complex patents [sic] questions raised by the new computer technology; the complexities of this case (complexities at least to a novice in the field) impress me as supporting that belief.[143]

In separate, undated one-page document apparently written by one of Justice Powell's own clerks, the clerk recommended granting certiorari. The clerk's memorandum acknowledged that "CCPA's interpretation of *Gottschalk v. Benson* does not seem totally out of line" because the Court had "stressed at least twice that that the algorithms [in *Benson*] were not tied to any particular end product," and here "the claim is limited to the use of the algorithm in a particular end-use and with a particular apparatus."[144] However, it also noted the importance of this issue because "uncertainty as to the meaning of *Gottschalk* is delaying and confusing the disposition of many applications for patents on computer programs," and "*Gottschalk* simply does not answer the question presented in this petition, but it seems to be one that should be answered."[145]

Justice Powell ultimately agreed with his clerk's recommendation, stating in a handwritten note that *Flook* was "a patent case that I don't understand. But [the Solicitor General] says doubt and confusion as to

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141. Starting in the early 1970s, in response to a rapidly-expanding increase in requests for Supreme Court discretionary review, a number of the Justices (including Justice Powell) agreed to "pool" their clerks so that only one clerk would be required to write a memorandum in response to each petition for certiorari, and this memorandum would be shared with all participating chambers. *See* David R. Stras, *The Supreme Court's Gatekeepers: The Role of Law Clerks in the Certiorari Process*, 85 TEX. L. REV. 947, 952–53 (2007) (reviewing TODD C. PEPPERS, COURTIERS OF THE MARBLE PALACE: THE RISE AND INFLUENCE OF THE SUPREME COURT LAW CLERK (2006)).

142. Preliminary Memorandum at 1–6, *in Flook* Case File, *supra* note 136, at 2–7.

143. *Id.* at 6.

144. Typewritten Note, Parker v. Flook (No. 77-642), *in Flook* Case File, *supra* note 136, at 2.

145. *Id.*

[the] meaning of *Gottschalk v. Benson* is widespread, and we should clarify."[146] At a conference on January 13, 1978, Justices White, Stevens, and Blackmun voted to grant the petition for certiorari; Justices Stewart, Brennan and Powell voted "join 3";[147] and Chief Justice Burger and Justice Rehnquist voted to deny the petition.[148] As a result, the Court agreed to review the CCPA's decision.[149]

3. Merits Stage

In its briefs at the merits stage, the government offered two reasons for why Flook's patent application should not be granted.[150] First, it contended that *Benson* required a claim containing a mathematical algorithm to include (1) a specific apparatus to implement the novel idea, and (2) the claim must only apply to a specific end-use or technological field.[151] Here, the government argued that the first element was not fulfilled because the calculation could be carried out in existing computers.[152] Second, the government argued that the CCPA's decision conflicted with *Funk Brothers*, where the court found that the application of a newly discovered scientific principle must be applied in an inventive way to be patentable.[153] Here, every step in the claim, other than the algorithm, fell within the prior art.[154]

At oral argument, the government challenged the CCPA's interpretation of *Benson*.[155] Responding to Justice Stewart, Deputy

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146. Preliminary Memorandum at 1 (handwritten notes of Justice Powell), *in Flook* Case File, *supra* note 136, at 2.

147. A "join 3" vote means that the Justice will prove the fourth vote to grant certiorari if three other Justices agree that a case merits review. *See* David M. O'Brien, *Join-3 Votes, the Rule of Four, the Cert. Pool, and the Supreme Court's Shrinking Plenary Docket*, 13 J.L. & POL. 779, 782 (1997) (explaining a "join 3" decision).

148. Certiorari Vote Tally Sheet, Parker v. Flook (No. 77-642) (Jan. 13, 1978), *in Flook* Case File, *supra* note 136, at 9.

149. Parker v. Flook, 434 U.S. 1033, 1033 (1978).

150. Brief for Petitioner, *supra* note 135, at *9–10, *13–23.

151. *Id.*

152. *See id.* at *16–17 ("[Flook]'s method does nothing more than provide a different mathematical procedure for calculating alarm limiting values on variables to be used in chemical processing, just as Benson's method provided a different mathematical procedure for calculating the pure binary equivalents of BCD numbers to be used in data processing. Neither method involves specific apparatus newly devised to implement the mathematical procedure. Rather, [Flook]'s method . . . involves computing apparatus that is old in the art; [Flook] expressly admitted . . . that the mathematical algorithm can be . . . 'carried out in existing computers long in use' . . . .").

153. *Id.* at *19–23.

154. *See id.* at *22 ("The only inventive contribution in [Flook]'s method is the mathematical formula by which alarm-limit values are calculated.").

155. Justice Powell's Handwritten Notes from Oral Argument, Parker v. Flook (No. 77-642), at 2 (argued Apr. 25, 1978), *in Flook* Case File, *supra* note 136, at 11.

Solicitor General Lawrence Wallace—representing the government—agreed that there could be a "combination patent" where an invention involved an unpatentable concept, but argued that there is not a "combination patent" here.[156] He also argued that this was an unpatentable process patent because the only new claim is the formula, and the entire process taken together was not novel as the formula was already being done by hand.[157]

In response, Flook contended that his application differed from *Benson* because his claim did not solely comprise of a mathematical algorithm; rather, it described an industrial process that incorporated the algorithm.[158] Further, one of the concerns in *Benson* was that granting the patent would give the applicant a broad monopoly because the applicability of the formula for converting binary code could be wider than predicted.[159] Here, in contrast, the patent would only apply to the use of the algorithm in a particular application (hydrocarbon cracking) because a post-solution activity was included.[160]

In a post-argument bench memorandum dated April 26, 1978, one of Justice Powell's law clerks stated:

> The case absolutely baffles me. It is difficult for several reasons. First, the patent laws generally are new to me, and I do not understand how some of the basic concepts and how the various sections of the statute inter-relate. Second, because of my unfamiliarity with patent law precedent, I am not able to reason by analogy from <u>known</u> instances to the issue in this case. I cannot compare the subject matter of this patent to other patentable subjects because I do not know of the other subjects. Finally, I do not understand exactly what [Flook]'s invention does. I do not understand how the mathematical equation works; nor do I understand exactly how it controls the catalytic conversion process.[161]

Justice Powell wrote in response that his law clerk "has lots of company."[162]

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156.   *Id.*

157.   *Id.*

158.   Memorandum to Justice Lewis F. Powell, Jr., Parker v. Flook (No. 77-642), at 5–6 (Apr. 26, 1978), *in Flook* Case File, *supra* note 136, at 20–21.

159.   *Id.* at 7.

160.   *See* Brief of the Respondent, Parker v. Flook, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 223450, at *17 (contending that other uses of the algorithm "would obviously not be in any way encompassed or preempted by [Flook]'s claims").

161.   Memorandum to Justice Powell at 1–2 (Apr. 26, 1978), *in Flook* Case File, *supra* note 136, at 14, 16.

162.   *Id.* at 2 (handwritten notes of Justice Powell).

The clerk's memorandum then went on to summarize the claimed invention, noting that "[i]t seems to be agreed by [the parties] that the equation in the second step of the claim is novel," even though "[o]ne of the <u>amici</u> disputes" this, and two law clerks from other chambers with math backgrounds agreed "that the algorithm is <u>not</u> new.[163] "Yet [the parties] have proceeded on the premise not only that the equation is new, but that it is the only thing novel about [Flook]'s purported invention."[164] Ultimately, the clerk concluded that "[i]n the long run, [Flook] probably should not be able to get a patent," either because the "whole claim is non-statutory subject matter under § 101; or under either § 102 or § 103, his claim is not novel or obvious because the only thing about it is the novel algorithm, which itself is not patentable."[165]

After considering these issues, Justice Powell commented in an undated, handwritten note that that he was tentatively inclined to reverse.[166] He noted that "to the limited extent that I understand *Benson* and *Funk* [*Brothers*], they appear to support the gov[ernmen]t."[167] Ultimately, Justice Powell noted "[i]t is not clear to me that [Flook] has done anything more than 'discover' an equation that alone achieves nothing concrete. . . . If an equation cannot be patented alone under § 101, it can't bootstrap itself simply be being added to other non-patentable steps."[168]

At the post-argument conference on April 28, 1978, the Justices initially voted to affirm the CCPA (and thus find Flook's claims patent eligible) in a 5–4 vote.[169] Below are each Justice's votes on patent eligibility,[170] along with a summary of Justice Powell's handwritten notes from the conference:

> <u>Chief Justice Burger</u>: Patent eligible. "Op[inion] of [CCPA] is inadequate and meaningless. The claims here is more than an 'idea' and thus *Benson* does not control. [Solicitor General]'s brief errs in relying on *Funk*—which is not helpful. A reversal here would foreclose a wide

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163.   *Id.* at 3. The memorandum further notes that the two clerks said "that when they looked at the equation they were astonished that anyone could contend that it is new." *Id.*

164.   *Id.* at 4.

165.   *Id.* at 4–5.

166.   Justice Powell's Pre-Conference Handwritten Note, Parker v. Flook (No. 77-642) at 2, *in Flook* Case File, *supra* note 136, at 34.

167.   *Id.* at 3.

168.   *Id*.

169.   Justice Powell's Conference Notes, Parker v. Flook (No. 77-642), at 1 (Apr. 28, 1978), in *Flook* Case File, *supra* note 136, at 36.

170.   For *Flook*, a vote in favor of patent eligibility was a vote to affirm the CCPA, while a vote against patent eligibility was a vote to reverse.

range of patents in computer field. This seems to be a 'process' within § 101."

Justice Brennan: Not patent eligible. "*Benson* did not create new law. Ideas never have been patentable. The idea here is a means of accomplishing a process already known in a more expeditious manner. There is no real change in the technology."

Justice Stewart: Patent eligible. "*Benson* held that a natural subject or idea can't be patented. But many patentable processes involve several elements[,] some of which are natural. The sole issue is whether the 'claim' is patentable under § 101. Other sections may present issues for another day. Other opinions by [CCPA] . . . are helpful in applying *Benson*. [CCPA] was clearly right."

Justice White: Patent eligible. "Affirm. Agrees with [Justice Stewart]. Gov[ernmen]t is trying to limit patents in this area unreasonable. Fact that same result was being obtained by hand is immaterial at this stage. This can come up later on an 'obviousness' claim."

Justice Marshall: Not patent eligible. No further notes.

Justice Blackmun: Patent eligible. "Have 'flip-flopped.' Doesn't agree with rationale of the opinion of [CCPA]—but on balance would affirm[]. Claim is patentable under [§] 101. May lose later under [§§] 102 and 103."

Justice Powell: Not patent eligible. "[V]ery tentative."

Justice Rehnquist: Patent eligible. "Agree with [Justice Stewart]."

Justice Stevens: Not patent eligible. "Can come out either way with a principled opinion. . . . *Benson* can be read either way. Interpretation of word 'discover' may be controlling. Two helpful cases: *Printing Press* case (see briefs) onto 'law of nature.' Mere fact that an algorithm is involved is not controlling. If this algorithm is not novel, there has been no discovery. Affirmance here would create enormous problems for patent office."[171]

However, shortly after the conference, Justice Blackmun changed his vote, resulting in a tentative 5–4 vote to reverse. In a memorandum circulated to the entire conference that same day, Justice Blackmun stated: "After further consideration, I change my vote from 'tentatively to affirm'

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171. Justice Powell's Conference Notes at 1–3, in *Flook* Case File, *supra* note 136, at 36–38.

to 'tentatively to reverse.'"[172] Justice Powell added a handwritten note to the memorandum noting that "[t]his makes the vote 5 to 4 to reverse."[173]

Justice Stevens circulated the first draft of the opinion for the Court on June 9, 1978.[174] Justices Blackmun, Brennan, Marshall, and Powell all swiftly joined this opinion.[175] On June 12, 1978, Justice White—who cast an initial vote at conference to affirm—indicated that he was now tentatively planning to reverse, noting in a memorandum to Justice Stevens that "I cast a very shaky vote to affirm in this case but have been unsettled about it. Your opinion, which I have examined with some care, now impresses me as the better view, but I shall await the dissent before coming to rest."[176] Justice White subsequently joined Justice Stevens' majority opinion,[177] resulting in the final 6–3 vote to reverse in *Flook*.

4. Court's Decision

The Court's opinion in *Flook* was issued on June 22, 1978. It reversed the CCPA, holding that the claimed invention was not eligible for patenting under § 101. After summarizing the claimed invention— including that "[t]he only difference between the conventional methods of changing alarm limits and that described in respondent's application rests in the second step—the mathematical algorithm or formula"[178]—and the procedural history, the Court's analysis begins with case law, as "[t]he plain language of § 101 does not answer the question."[179] Citing *Le Roy*,

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172.   Memorandum from Justice Harry A. Blackmun to Chief Justice Warren Burger, Parker v. Flook (No. 77-642) (Apr. 28, 1978), in *Flook* Case File, *supra* note 136, at 39.

173.   *Id.* (handwritten note by Justice Powell).

174.   First Draft, Opinion for the Court, Parker v. Flook (No. 77-642) at 1–14 (circulated June 9, 1978), *in Flook* Case File, *supra* note 136, at 41–54.

175.   Memorandum from Justice William J. Brennan, Jr., to Justice John Paul Stevens, Parker v. Flook (No. 77-642) (June 8, 1978), in *Flook* Case File, *supra* note 136, at 40; Memorandum from Justice Harry A. Blackmun to Justice John Paul Stevens, Parker v. Flook (No. 77-642) (June 12, 1978), in *Flook* Case File, *supra* note 136, at 58; Memorandum from Justice Lewis F. Powell, Jr., to Justice John Paul Stevens, Parker v. Flook (June 13, 1978), in *Flook* Case File, *supra* note 136, at 60. Justice Powell's case file for *Flook* does not contain a join memo from Justice Thurgood Marshall, but a handwritten note indicates that he joined Justice Stevens's opinion for the Court on June 7, 1978. Handwritten Note by Justice Lewis F. Powell, Jr., Parker v. Flook (No. 77-642), in *Flook* Case File, *supra* note 136, at 62.

176.   Memorandum from Justice Byron R. White to Justice John Paul Stevens, Parker v. Flook, (No. 77-642) (June 12, 1978), in *Flook* Case File, *supra* note 136, at 57.

177.   Memorandum from Justice Byron R. White to Justice John Paul Stevens, Parker v. Flook (No. 77-642) (June 12, 1978), in *Flook* Case File, *supra* note 136, at 59.

178.   Parker v. Flook, 437 U.S. 584, 585–86 (1978); *see also id.* at 588 ("We also assume, since [Flook] does not challenge the examiner's finding, that the formula is the only novel feature of [the claimed] method.").

179.   *Id.* at 588–89.

Mackay Radio, and *Funk Brothers* in support, Justice Stevens' opinion declares that "[t]he process itself, not merely the mathematical algorithm, must be new and useful" to be patent eligible.[180] "Indeed, the novelty of the mathematical algorithm is not a determining factor at all," because "as one of the 'basic tools of scientific and technological work,' it is treated as though it were . . . part of the prior art."[181] Then, citing *Morse*, it explains that because "a scientific principle cannot be patented," it must be treated "as if the principle or mathematical formula were well known."[182]

The Court's opinion then responds to several of Flook's contentions. First, it rejects the claim that "if a process application implements a principle in some specific fashion, it automatically falls within the patentable subject matter of § 101 and the substantive patentability of the particular process can then be determined by the conditions of §§ 102 and 103."[183] Such an approach "would make the determination of patentable subject matter depend simply on the draftsman's art."[184] "The rule that the discovery of a law of nature cannot be patented rests, not on the notion that natural phenomena are not processes [under § 101], but rather on the more fundamental understanding that they are not the kind of 'discoveries' that the statute was enacted to protect."[185]

Second, the Court rejected Flook's argument that the examiner improperly rejected his claim because one of its components was ineligible, explaining that "a patent claim must be considered as a whole."[186] Viewing the claim in its entirety, the Court explained:

> [Flook]'s process is unpatentable . . . because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention. . . . The chemical processes involved in catalytic conversion of hydrocarbons are well known, as are the practice of monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for "automatic monitoring-alarming." [Flook]'s application simply provides a new and presumably better method for calculating alarm limit values. If we assume that that method was also known, as we must under . . . *Morse*, then [Flook]'s claim is, in effect, comparable to a claim that the formula

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180.   *Id.* at 589–91.
181.   *Id.* at 591–92 (citing Gottschalk v. Benson, 409 U.S. 63, 67 (1972)).
182.   *Id.* at 592.
183.   *Id.* at 593.
184.   *Id.*
185.   *Id.*
186.   *Id.* at 594.

2πr can be usefully applied in determining the circumference of a wheel.[187]

In a phrase echoed in later decisions, the Court declared that "the discovery of . . . a phenomenon [of nature] cannot support a patent unless there is some other inventive concept in its application."[188] Finally, as in *Benson*, the Court noted that "patent protection of certain novel and useful computer programs" involved "[d]ifficult questions of policy," and suggested that Congress would be better suited to addressing this issue.[189]

Writing for the three dissenters, Justice Stewart contended that *Benson* was very narrow in scope, precluding only "claims for an algorithm that 'were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.'"[190] In his view, "[t]he present case is a far different one" than *Benson* because only one step in Flook's process, "if considered in isolation," would not be patent eligible.[191] The dissent criticized the majority for "importing into its inquiry" of patent eligibility "under 35 U.S.C. § 101 the criteria of novelty and [nonobviousness]" under §§ 102 and 103.[192]

C.   Diamond v. Chakrabarty

1.   Facts and Procedural History

Two separate cases regarding the patentability of living organisms—*In re Bergy* and *In re Chakrabarty*—were consolidated by the Court,[193] but the *Bergy* case was mooted while the appeal was pending,[194] leaving the patentability of Chakrabarty's invention as the sole remaining issue.

In the first case, three scientists working for Upjohn (Bergy) filed a patent application in 1974 claiming a biologically pure culture of the microorganism *Streptomyces vellosus*, which was capable of producing the antibiotic lincomycin in a recoverable quantity after fermentation in a growth medium.[195] The examiner rejected this claim on the basis that it

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187.   *Id.* at 594–95*.*
188.   *Id.* at 594.
189.   *Id.* at 595–96.
190.   *Id.* at 599 (Stewart, J., dissenting) (internal citation omitted).
191.   *Id.* (Stewart, J., dissenting).
192.   *Id.* at 600 (Stewart, J., dissenting).
193.   Diamond v. Bergy, 444 U.S. 924, 924 (1979).
194.   *See* Diamond v. Chakrabarty, 444 U.S. 1028, 1028 (1980) (vacating and remanding *Bergy* to the CCPA with directions to dismiss the appeal as moot).
195.   *In re* Bergy, 563 F.2d 1031, 1032 (C.C.P.A. 1977).

claimed a "product of nature" that was not patent eligible.[196] Bergy responded that the invention was a patentable manufacture under § 101 because the claimed microorganism "did not exist as a biologically pure culture in nature."[197] A majority of the BPAI affirmed the rejection, holding that Bergy claimed a "a living organism," which does not fall within any of the statutory categories of patentable subject matter under § 101.[198] It explained:

> We have extensively researched prior court decisions for guidance to the question of whether or not a microorganism, being a living thing, is or is not within the realm of statutory patentable subject matter, but, other than possibly non-controlling dicta, have not found any case directly in point.

> It is our view that 35 U.S.C. 101 must be strictly construed and, when so interpreted, precludes the patenting of a living organism. We reach this conclusion on the basis that only those categories of subject matter specifically enumerated in the statute are patentable and a living organism does not fall within the scope of any of those categories listed.[199]

The BPAI majority also reasoned that the Plant Patent Act of 1930,[200] which authorized the issuance of patents for new, asexually reproduced plants, supported its conclusion, as this statute would have been superfluous if § 101 already authorized the patenting of living organisms.[201] The dissenting member of the BPAI panel contended that the claimed bacteria culture qualified as either a "composition" or "manufacture" if other steps were necessary to treat the bacteria to obtain the antibiotic.[202]

On appeal, the CCPA reversed, holding in a 3–2 decision that the claimed invention was patent eligible.[203] Writing for the majority, Judge Giles Rich argued that the biologically pure culture of *Streptomyces vellosus* was not an unpatentable product of nature because it "does not exist in, is not found in, and is not a product of, 'nature.' It is man-made and can be produced only under carefully controlled laboratory

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196.   *Id.* at 1032–33.

197.   *Id.* at 1033.

198.   *Ex parte* Bergy, 197 U.S.P.Q. 78, 1976 WL 20961, at *1 (1976).

199.   *Id.*

200.   46 Stat. 703 (1930) (codified at 35 U.S.C. §§ 161–164).

201.   *Bergy*, 197 U.S.P.Q. 78, 1976 WL 20961, at *1–2.

202.   *Id.* at *2–3 (Katz, dissenting).

203.   *In re* Bergy, 563 F.2d 1031, 1032 (C.C.P.A. 1977).

conditions."[204] Furthermore, the fact that the claimed invention included a living organism did not make it patent ineligible, according to Judge Rich, because "processes, one of the categories of patentable subject matter specified in § 101, are . . . statutory subject matter notwithstanding the employment therein of living organisms and their life processes."[205] The fact that the microorganism in the claimed invention is alive is "without legal significance" because it is "an industrial product used in an industrial process."[206] Judge Rich also contended that policy reasons supported this outcome, as "microorganisms have come to be important tools in the chemical industry, especially the pharmaceutical branch . . . . It is because it is alive that it is useful."[207] As a result, "[w]e think it is in the public interest to include microorganisms within the terms 'manufacture' and 'composition of matter' in § 101."[208] Dissenting, Judges Miller and Baldwin agreed with the BPAI that the existence and legislative history of the Plant Patent Act suggested that Congress believed § 101 did not encompass living organisms, including biologically pure culture of bacteria.[209]

The following year (1978), the Supreme Court granted certiorari in *Bergy* and vacated and remanded the CCPA's decision in light of *Flook*.[210]

In the second case, Dr. Ananda Chakrabarty, a microbiologist working for General Electric (GE), sought to patent a genetically-modified bacterium from the genus *Pseudomonas* that was capable of breaking down hydrocarbons in crude oil.[211] Dr. Chakrabarty created this new strain of bacteria by incorporating plasmids from other bacteria into a single *Pseudonomas* cell, which gave the modified cell the capacity to simultaneously degrade multiple components of crude oil more rapidly.[212] The examiner rejected claims to the bacteria itself[213] on the grounds that

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204. *Id.* at 1035.
205. *Id.* at 1037.
206. *Id.* at 1038.
207. *Id.*
208. *Id.*
209. *Id.* at 1039–42 (Miller, J., dissenting).
210. Parker v. Bergy, 438 U.S. 902, 902 (1978).
211. *In re* Chakrabarty, 571 F.2d 40, 41 (C.C.P.A. 1978).
212. *Id.*
213. *Id.* Claim 7 of Chakrabarty's application is illustrative: "A bacteria from the genus Pseudomonas containing therein at least two stable energy-generating plasmids, each of said plasmids providing a separate hydrocarbon degradative pathway." *Id.* at 41–42. The examiner allowed two other categories of claims in Chakrabarty's patent application: process claims for the method of producing the bacteria, and claims for an inoculum comprising a carrier material, such as straw, and the new bacteria. Diamond v. Chakrabarty, 447 U.S. 303, 305–06 (1980).

it was not patent eligible under § 101 for two reasons: (1) that it was a product of nature, and (2) that the claim was drawn to a living organism.[214]

The BPAI reversed the examiner on the first issue, thus agreeing with Chakrabarty that the claimed bacteria were not naturally occurring, but affirmed on the second issue.[215] The BPAI's reasoning was similar to *Bergy*, holding that the bacteria were living organisms and thus unpatentable because § 101 "does not include living organisms."[216] On appeal, the CCPA reversed, citing its decision in *Bergy* as dispositive that claims directed to microorganisms fall within § 101 and thus are patent eligible.[217]

The USPTO then filed a petition for writ of certiorari in *Chakrabarty*. Shortly after this, the CCPA vacated its earlier judgment, recalled its mandate, and restored the appeal to its calendar so that it could consider it in conjunction with *Bergy*, which had been remanded back to the CCPA following *Flook*. As a result, the Court dismissed the petition for certiorari on August 25, 1978.[218]

Following remand, the CCPA issued a lengthy decision addressing both *Bergy* and *Chakrabarty*.[219] In a 3–2 decision, the court reaffirmed its earlier decisions that both claimed inventions were patent eligible under § 101. Judge Rich's opinion for the majority recounted the procedural history of the two cases, the relevant constitutional and statutory text, and the Supreme Court's recent decision in *Flook*.[220] After sharply criticizing *Flook*,[221] the majority concluded that it had no impact on the issues presented here.[222] The majority then "adhere[d] to [its] former decisions that Bergy's and Chakrabarty's appealed claims define subject matter that falls within the categories named in § 101" and thus are patent eligible.[223]

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214.   *In re Chakrabarty*, 571 F.2d at 42.

215.   *Id.*

216.   *Id.*

217.   *Id.* at 43.

218.   Banner v. Chakrabarty, 439 U.S. 801, 801 (1978).

219.   *In re* Bergy, 596 F.2d 952 (C.C.P.A. 1979). The two cases were not formally consolidated, but heard and decided together because "they involve only the same single question of law." *Id.* at 955.

220.   *Id.* at 956–67.

221.   For instance, the CCPA contended that *Flook* "may have an unintended impact in putting an untimely and unjustifiable end to long-standing proposition of law that patentability may be predicated on discovering the cause of a problem even though, once that *cause* is known, the solution is brought about by obvious means. Such causes may often be classed as laws of nature or their effects. The potential for great harm to the incentives of the patent system is apparent." *Id.* at 966.

222.   *See id.* at 967 ("To conclude on the light *Flook* sheds on these cases, very simply, for the reasons we have stated, we find none.").

223.   *Id.* at 973.

2. Petition for Writ of Certiorari

On July 27, 1979, the USPTO filed a petition for a writ of certiorari to the Supreme Court in both *Bergy* and *Chakrabarty*.[224] The Solicitor General, representing the government, stated that these cases presented an issue of first impression for the Court—"[w]hether a living organism is patentable subject matter under [§] 101."[225] It contended that the claims at issue here were not patent eligible, asserting that Congress did not "intend[] to include living things within the scope of the general patent laws."[226] It further argued that the Plant Patent Act of 1930 and the Plant Variety Protection Act of 1970 further supported this conclusion because "Congress evidently believe[s] that existing patent law did not extend to living things, for if plants, as living things, were already patentable under [§] 101."[227]

The memorandum from the cert pool clerk recommended denying certiorari.[228] After summarizing the facts, procedural history, lower court decision, and the parties' arguments, the memorandum acknowledged that the "issue presented is important" but concluded that it did not warrant the attention of the Court at this time.[229] It contended that the CCPA's decision was "extremely thorough and carefully examines the issue in light of *Flook*," and argued that "in order to avoid further complicating the already highly controversial policy problems surrounding genetic engineering, it would seem preferable to examine such problems in a case that actually present them rather than in a case, such as this one, which can be construed as applying only to microorganisms."[230] The memorandum also noted the absence of a circuit split on this issue, and asserted that "the conclusion reached by the court below is well-supported and does not seem to be incorrect."[231] In a handwritten note on the first page of this memorandum, Justice Powell's own law clerk disagreed with this assessment, stating that "I would lean to grant. This is not the sort of

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224.   Petition for Writ of Certiorari, Parker v. Bergy, 438 U.S. 902 (1978) (No. 79-136), 1979 U.S. S. Ct. Briefs LEXIS 1200.

225.   *Id.* at *3, *13.

226.   *Id.* at *18.

227.   *Id.*

228.   *See* Supreme Court Case File, Diamond v. Chakrabarty, No. 79-136 (1979), at 6, *in* Lewis F. Powell, Jr. Archive, Box 523/Folder 10–12 [hereinafter *Chakrabarty* Case File], https://scholarlycommons.law.wlu.edu/casefiles/648 [https://perma.cc/4X5F-3V6D].

229.   Preliminary Memorandum, Parker v. Bergy (No. 79-136), at 5 (Oct. 26, 1979), *in Chakrabarty* Case File, *supra* note 228, at 6.

230.   *Id.* at 5–6.

231.   *Id.*

issue that can be left to sit if the Court ever wants to take it."[232] Justice Powell agreed with his clerk's assessment, ultimately voting to grant certiorari.

In a conference on October 26, 1979, Justices Blackmun, Brennan, Powell, and White voted to grant the petition for certiorari in both *Bergy* and *Chakrabarty*.[233] Chief Justice Burger and Justices Stewart, Marshall, Rehnquist, and Stevens voted to deny the petition.[234] The petition for certiorari was formally granted on October 29, 1979, and the two cases were consolidated into a single appeal.[235] However, Bergy abandoned the patent application prior to oral argument, and the Justices unanimously granted the petition to vacate the CCPA's decision in *Bergy* and remand it with instructions to dismiss the appeal as moot,[236] leaving Chakrabarty's patent application as the sole case under consideration.

3. Merits Stage

In its briefing, the Solicitor General argued that absent clear congressional intent to afford patent protection to living organisms, § 101 should not be interpreted to extend patent eligibility to living things, including microorganisms.[237] The government also pointed to the Plant Patent Act of 1930 and the Plant Variety Act of 1970 as evidence that Congress did not intend for living organisms to be patent eligible.[238] If Congress considered living things to be covered by § 101, then it would not have felt the need to enact separate legislation for a subset of living organisms.[239] In addition, the government raised potential ethical, health, and economic concerns regarding the patentability of living organisms, and argued that "[t]he difficult policy questions raised by extension of patent protection" of living organisms required the Court "to proceed with great caution."[240]

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232.   *Id.* at 1 (handwritten note on bottom of page).
233.   Certiorari Vote Tally Sheet, Parker v. Bergy (No. 79-136) (Oct. 26, 1979), *in Chakrabarty* Case File, *supra* note 228, at 8.
234.   *Id*.
235.   Diamond v. Bergy, 444 U.S. 924, 924 (1979).
236.   Memorandum, Motion of Bergy to Dismiss and Vacate as to Bergy, et al., Diamond v. Bergy (No. 79-136) (Jan. 11, 1980), *in Chakrabarty* Case File, *supra* note 228, at 9; Vote Tally Sheet, Motion to Dismiss and Vacate as to Bergy, Diamond v. Bergy (No. 79-136) (Jan. 11, 1980), *in Chakrabarty* Case File, *supra* note 228, at 10.
237.   Brief for Petitioner, Diamond v. Bergy, 444 U.S. 924 (1979) (No. 79-136), 1980 WL 339757, at *12.
238.   *Id.* at *22–23.
239.   *Id.* at *23.
240.   *Id.* at *20–21.

In response, Chakrabarty contended that the government's position would require the Court to reverse a long-standing policy of granting patents involving living organisms.[241] Chakrabarty's brief cited numerous instances where the USPTO had previously granted patents which included microorganisms as part of the claimed invention,[242] as well as prior lower court decisions that upheld the validity of claims involving living organisms.[243] In addition, Chakrabarty argued a man-made bacterium like the one at issue here fell within the statutory categories of "manufacture" and "composition of matter" under § 101.[244] Finally, Chakrabarty contended that the legislative history of the Plant Patent Act of 1930 and the Plant Variety Protection Act of 1970 "does not reveal[,] either by expression or by implication, that the living nature of plants was what placed them outside the scope of the patent law."[245]

In a bench memorandum prior to oral argument, Justice Powell's law clerk expressed uncertainty about the outcome, stating that "[f]or . . . the first time this year, I have no firm view of a case. The questions involved are large, complex, and center on matters that I have no background in: biochemistry and patent law."[246] After summarizing the claimed invention, the procedural history, and the parties' arguments, the memorandum stated that "[t]here is no persuasive legislative history on this dispute," and neither sides' arguments were "especially compelling or silly."[247] Ultimately, the memorandum contended that "Congress is the proper forum for [this issue's] resolution,"[248] and it proposed either reversing the CCPA, which "could well result in legislative action," or remanding for review of the "product of nature" issue, which was not addressed in the lower court's most recent decision.[249]

In handwritten notes on this bench memorandum, Justice Powell stated that the "CCPA doesn't like *Flook*, [and] wrote around it in holding in *Bergy* . . . that a living organism <u>may</u> be patented. Patent law [was] not written with modern science [and] technology in mind. Congress should

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241.   Brief for Respondent, Diamond v. Chakrabarty, 444 U.S. 1028 (1980) (No. 79-136), 1980 WL 339758, at *12.

242.   *Id.* at *18–21, *50–52.

243.   *Id.* at *15–16 (citing Penn. Res. Corp. v. Lescarboura Spawn Co., 29 F. Supp. 340 (E.D. Pa. 1939); Guaranty Trust Co. of N.Y. v. Union Solvents Corp., 54 F.2d 400 (D. Del. 1931)).

244.   Brief for Respondent, *supra* note 241, at *37–42.

245.   *Id.* at *42.

246.   Bench Memorandum to Justice Lewis F. Powell, Jr., Diamond v. Chakrabarty (No. 79-136), at 2 (Mar. 13, 1980), *in Chakrabarty* Case File, *supra* note 228, at 12.

247.   *Id.* at 4–5.

248.   *Id.* at 6.

249.   *Id.* at 6–7.

address the 'living organism' issue."[250] Justice Powell also noted that his clerk thinks—and "I agree—that Congress should clarify [the] patent laws. One way to avoid an 'up or down' jud[icial] resolution of this issue is to remand" the case to the CCPA.[251] In a separate handwritten note dated March 19, 1980—two days after oral argument—Justice Powell noted that he was "[i]nclined to [r]everse" because "[p]atent laws [were] not written with [the] most recent science and technology in mind. [The] [l]anguage of § 101 is broad enough—like [the] Sherman Act—to cover almost anything . . . . But Congress has never considered the patentability of . . . living organisms."[252]

At the post-argument conference on March 19, 1980, the Justices voted 5–4 to affirm the CCPA, thus finding Chakrabarty's claims to the bacteria to be patentable subject matter under § 101.[253] Below are each Justice's votes on patent eligibility,[254] along with a summary of Justice Powell's notes from the conference:

> Chief Justice (Burger): Patent eligible. The Chief Justice stated "[t]his case falls within literal language of § 101—manufacture or composition of matter." He added that Chakrabarty has other hurdles, such as obviousness, to receiving a patent. Furthermore, "Congress can reverse any decision we make."
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> Justice Brennan: Not patent eligible. Justice Brennan agreed with government's argument that Congress has not considered this issue, and "[o]nly what Congress says is patentable may be patented." While § 101 could include living organisms, "Congress has not been specific enough to warrant going this far."
>
> Justice Stewart: Patent eligible. Justice Stewart contended that the "language of [§] 101 does not exclude living organisms." Further, "*Flook* said we should proceed cautiously—but we can be cautious and still affirm. For years [USPTO] has been going farther than this." Finally, he stated the "Plant Patent Act is irrelevant."

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250.   *Id.* at 1 (handwritten notes of Justice Powell).

251.   *Id.*

252.   Justice Powell's Pre-Conference Handwritten Note, Diamond v. Chakrabarty (No. 79-136) (Mar. 19, 1980), *in Chakrabarty* Case File, *supra* note 228, at 24.

253.   Justice Powell's Conference Notes, Diamond v. Chakrabarty (No. 79-136), at 1 (Mar. 19, 1980), *in Chakrabarty* Case File, *supra* note 228, at 25.

254.   For *Chakrabarty*, a vote in favor of patent eligibility was a vote to affirm the CCPA, while a vote against patent eligibility was a vote to reverse.

Justice White: Not patent eligible. Stating this was an "[a]wfully close case," he tentatively agreed with Justice Brennan. Unlike Justice Stewart, he believed that "[t]he Plant Patent Act is relevant."

Justice Marshall: Not patent eligible. No further notes.

Justice Blackmun: Patent eligible. Justice Blackmun thought the Court "should not say 'life' isn't patentable." Additionally, *Flook* "points towards affirmance" of the CCPA's decision.

Justice Powell: Not patent eligible. Justice Powell noted his vote was "tentative."

Justice Rehnquist: Patent eligible. Justice Rehnquist stated that "Congress *has* addressed this question—as recently as 1952" and that the language of § 101 is "broad enough to include" living organisms.

Justice Stevens: Patent eligible. Justice Stevens thought this was a "difficult case." He recognized the claimed invention was "a man made living thing." However, he voted to affirm the CCPA's decision because "*Funk* and other cases[] support patentab[ility]." Further, he believed the language of § 101 could "cover this" as a "composition of matter."[255]

Chief Justice Burger circulated a first draft of the opinion on May 8, 1980, to the conference.[256] Justices Blackmun, Rehnquist, Stewart, and Stevens joined the opinion.[257]

Justice Brennan circulated a first draft of the dissenting opinion on May 28, 1980.[258] This was followed by join notices from Justices Marshall and White on the same day.[259] In individual correspondence to Justice

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255. Justice Powell's Conference Notes, Diamond v. Chakrabarty (No. 79-136), at 1–3 (Mar. 19, 1980), *in Chakrabarty* Case File, *supra* note 228, at 25–27.

256. First Draft, Opinion for the Court, Diamond v. Chakrabarty (No. 79-136) (circulated May 8, 1980), *in Chakrabarty* Case File, *supra* note 228, at 30–43.

257. Memorandum from Justice Potter Stewart to Chief Justice Warren Burger, Diamond v. Chakrabarty (No. 79-136) (May 9, 1980), *in Chakrabarty* Case File, *supra* note 228, at 58; Memorandum from Justice William H. Rehnquist to Chief Justice Warren Burger, Diamond v. Chakrabarty (No. 79-136) (May 12, 1980), *in Chakrabarty* Case File, *supra* note 228, at 60; Memorandum from Justice Harry A. Blackmun to Chief Justice Warren Burger, Diamond v. Chakrabarty (No. 79-136) (May 12, 1980), *in Chakrabarty* Case File, *supra* note 228, at 61; Memorandum from Justice John Paul Stevens to Chief Justice Warren Burger, Diamond v. Chakrabarty (No. 79-136) (May 14, 1980), *in Chakrabarty* Case File, *supra* note 228, at 65.

258. First Draft, Dissenting Opinion by Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (May 28, 1980), *in Chakrabarty* Case File, *supra* note 228, at 66–69.

259. Memorandum from Justice Byron R. White to Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (May 28, 1980), *in Chakrabarty* Case File, *supra* note 228, at 70; Memorandum from Justice Thurgood Marshall to Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (May 28, 1980), *in Chakrabarty* Case File, *supra* note 228, at 72.

Brennan on May 29, 1980, Justice Powell proposed the addition of a final paragraph to the dissent, which would state:

> The Court protests that its holding today is dictated by the broad language of § 101, which "cannot be confined to the 'particular application[s] . . . contemplated by the legislators.'" *Ante*, at 12, quoting *Barr v. United States*, 324 U.S. 83, 90 (1945). But this decision does not follow the unavoidable implications of the statute. Rather, it extends the patent system to cover living material even though Congress plainly has legislated in the belief that § 101 does not encompass living organisms. It is the role of Congress, not this Court, to broaden or narrow the reach of the patent laws. This is especially true where, as here, the composition sought to be patented uniquely implicates matters of public concern.[260]

On June 2, 1980, Justice Brennan circulated a second draft of the dissent that included Justice Powell's proposed final paragraph.[261] Justice Powell then sent a join notice for the dissent.[262] A third and final draft of the dissent was circulated the following day.[263]

4. Court's Decision

The Court's decision in *Chakrabarty* was issued on June 16, 1980. Writing for the majority, Chief Justice Burger stated the issue in the case was "whether a live, human-made micro-organism is patentable subject matter under 35 U.S.C. § 101."[264] After summarizing the claimed invention and procedural history, the majority's opinion framed the issue as a "narrow one of statutory interpretation . . . . [s]pecifically, we must determine whether [Chakrabarty]'s micro-organism constitutes a 'manufacture' or 'composition of matter' within the meaning of

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260. Memorandum from Justice Lewis F. Powell, Jr., to Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (May 29, 1980), *in Chakrabarty* Case File, *supra* note 228, at 74. All of this language, except for the final sentence (which was handwritten), appears to have been drafted by one of Justice Powell's law clerks. Bench Memorandum to Justice Lewis F. Powell, Jr., Diamond v. Chakrabarty (No. 79-136) (May 29, 1980), *in Chakrabarty* Case File, *supra* note 228, at 73.

261. Second Draft, Dissenting Opinion by Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (circulated June 2, 1980), *in Chakrabarty* Case File, *supra* note 228, at 76–79.

262. Memorandum from Justice Lewis F. Powell, Jr., to Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (June 2, 1980), *in Chakrabarty* Case File, *supra* note 228, at 75.

263. Third Draft, Dissenting Opinion by Justice William J. Brennan, Jr., Diamond v. Chakrabarty (No. 79-136) (circulated June 3, 1980), *in Chakrabarty* Case File, *supra* note 228, at 80–83.

264. Diamond v. Chakrabarty, 447 U.S. 303, 305 (1980).

[§ 101].”[265] Relying on canons of statutory construction, the majority construed "manufacture" and "composition of matter" broadly.[266] It further asserted that "[t]he relevant legislative history supports a broad construction," citing language from the Committee Reports of the 1952 Patent Act that "Congress intended [patentable] subject matter to 'include anything under the sun that is made by man.'"[267]

While recognizing that "laws of nature, physical phenomena, and abstracts ideas have been held not patentable," citing *Le Roy*, *Morse*, *Funk Brothers, Benson*, and *Flook*, the majority contended that Chakrabarty's "micro-organism plainly qualifies as patentable subject matter. His claim is not to a hitherto unknown natural phenomena, but a nonnaturally occurring manufacture or composition of matter—a product of human ingenuity 'having a distinctive name, character, [and] use.'"[268] The majority specifically distinguished Chakrabarty's invention from the root nodule bacteria claimed in *Funk Brothers* on the basis that the latter involved only discovery of naturally-occurring phenomenon rather than creating an entirely new type of bacteria through genetic engineering.[269] The majority's opinion also responded to the government's argument that the 1930 Plant Patent Act and the 1970 Plant Variety Protection Act evinced an understanding by Congress that living organisms fell outside the ambit of § 101, reasoning that "Congress . . . recognized that the relevant distinction was not between living and inanimate things, but between products of nature, whether living or not, and human-made inventions."[270] Finally, the opinion rejected the government's argument that the Court should not extend patent eligibility to microorganisms unless and until Congress "expressly authorizes such protection," asserting that "Congress employed broad general language in § 101 precisely because [ground-breaking] inventions are often unforeseeable."[271] It also dismissed the public policy concerns regarding genetic engineering, asserting that such arguments should be directed toward Congress and the Executive Branch.[272]

In dissent, Justice Brennan "agree[d] with the Court that the question before us is a narrow one," but disagreed with the outcome, asserting that the 1930 Plant Patent Act "evidence[s] Congress' understanding, at least

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265.   *Id.* at 307.
266.   *Id.* at 308.
267.   *Id.* at 309.
268.   *Id.* at 309–10 (citing Hartranft v. Weigmann, 121 U.S. 609, 615 (1887)).
269.   *Id.* at 310.
270.   *Id.* at 313.
271.   *Id.* at 315–16.
272.   *Id.* at 316–17.

since 1930, that § 101 does not include living organisms."[273] In addition, the dissent argued that the 1970 Plant Variety Protection Act "clearly indicates that Congress has included bacteria within the focus of its legislative concern, but not within the scope of patent protection," by "specifically exclud[ing] bacteria from the coverage of [that] Act."[274] "Given the complexity and legislative nature of this delicate task, we must be careful to extend patent protection no further than Congress has provided."[275] The dissent concluded with the final paragraph recommended by Justice Powell, asserting that "[i]t is the role of Congress, not this Court, to broaden or narrow the reach of the patent laws."[276]

D.   Diamond v. Diehr

1. Facts and Procedural History

In 1975, James Diehr and Theodore Lutton (Diehr) filed a patent application for an improved rubber curing process.[277] The claimed process employed several mathematical formulas, including the well-known Arrhenius equation, to repeatedly calculate the cure time for rubber articles based on repeated measurements taken during the curing process.[278] The result is precisely cured rubber with minimal over- or under-processed waste product.[279]

Initially, the patent examiner rejected Diehr's claim as not patent eligible under 35 U.S.C. § 101 because "[t]he only non-conventional claim steps 'define[d] a computer program for taking repeated temperature measurements from the mold and calculating cure time in response to said measurement data.'"[280] The examiner interpreted the Supreme Court's decision in *Flook* to have "declined to extend patent protection absent a considered action by Congress."[281] The BPAI affirmed the patent examiner's rejection, similarly relying on *Flook*.[282] Further, "[i]t dismissed appellants' argument that no computer program was

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273.   *Id.* at 318–20 (Brennan, J., dissenting).
274.   *Id.* at 321 (Brennan, J., dissenting).
275.   *Id.* at 319 (Brennan, J., dissenting).
276.   *Id.* at 321–22 (Brennan, J., dissenting).
277.   *See In re* Diehr, 602 F.2d 982, 983 (C.C.P.A. 1979).
278.   Diamond v. Diehr, 450 U.S. 175, 177–80 (1981).
279.   *In re Diehr*, 602 F.2d at 983.
280.   *Id.* at 984.
281.   *Id.* (quoting the patent examiner).
282.   *Id.*

disclosed in the specification, citing an admission to the contrary made by appellants during prosecution."[283]

Diehr appealed this decision to the CCPA, which found the claim to be patent eligible and reversed the examiner's rejection.[284] The CCPA concluded that Diehr was not attempting to patent a mathematical formula by itself, but rather an entire process for molding rubber articles, including novel steps not used in prior art for rubber making.[285] The prior art in the rubber making industry did not include the step of continuously measuring and recalculating the curing of rubber inside the press so that the door can be opened at exactly the proper time.[286] Furthermore, it held that the BPAI improperly included "[n]ovelty considerations[, which] ha[d] no bearing on whether claims define statutory subject matter under § 101."[287] Finally, it determined that granting the patent would not preclude others from using the Arrhenius equation in other contexts.[288]

2. Petition for Writ of Certiorari

Following the CCPA's decision, the USPTO filed petition for writ of certiorari with the Supreme Court.[289] The Solicitor General, acting on behalf of the USPTO, contended that the lower court incorrectly decided this case and urged the Court to grant certiorari.[290]

A memorandum by the cert pool clerk recommended granting certiorari.[291] After discussing the facts and procedural history, the memorandum noted that the Solicitor General contended "this is the second time in two months that the CCPA has refused to apply" *Flook* and that this case is "indistinguishable" from *Flook* because "[t]he only new element in [Respondents'] claim was the use of a computer to recalculate cure time. Since the mathematical algorithm cannot be patented, the patent application was properly denied."[292] The pool clerk appeared to agree with

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283. *Id.*
284. *Id.* at 989.
285. *Id.*
286. *Id.*
287. *Id.*
288. *Id.* at 986.
289. Petition for Writ of Certiorari, Diamond v. Diehr, 450 U.S. 175 (1981) (No. 79-1112), 1980 U.S. S. Ct. Briefs LEXIS 1851.
290. *See* Supreme Court Case File, Diamond v. Diehr, No. 79-1112 (1981), *in* Lewis F. Powell, Jr. Archive, Box 534/Folder 15–18 [hereinafter *Diehr* Case File] https://scholarlycommons.law.wlu.edu/casefiles/647 [https://perma.cc/NDG9-577M].
291. Preliminary Memorandum, Diamond v. Diehr (No. 79-1112), at 1–6 (Mar. 14, 1980), *in Diehr* Case File, *supra* note 290, at 2–7.
292. *Id.* at 3–4.

the Solicitor General's assessment, stating that "[t]he only distinction I see between this case and *Flook* is that [Respondents] here, unlike . . . in *Flook*, do not concede that all the elements of their invention other than the formula are nonnovel."[293] The pool clerk asserted that the CCPA erred by "interpret[ing] *Flook* as not requiring segregation of the nonpatentable algorithm and examination of the rest of the invention for novelty."[294] As a result, the clerk recommended granting the government's petition and consolidating *Diehr* with another pending case, *Diamond v. Bradley*, that raised a similar issue, as the Solicitor General suggested.[295] In a handwritten note on the memorandum, Justice Powell noted that the CCPA "seems to have muffed this patent case (that I don't understand)" and that "I could be persuaded to grant."[296]

At a conference on March 14, 1980, Justices Blackmun, Powell, Stevens, and White all voted to grant certiorari.[297] Chief Justice Burger and Justices Brennan, Marshall, and Rehnquist voted to deny the petition.[298] Justice Stewart voted to join three.[299] Justice Powell noted that all of the Justices voted in the same way here as in *Diamond v. Bradley*, a case where the Solicitor General also urged the Court to grant certiorari and consolidate with *Diehr*.[300] The Court issued an order grant certiorari on March 17, 1980,[301] with briefing and oral arguments ultimately scheduled for the following term.

3. Merits Stage

In its opening brief, the government argued that the claimed invention was indistinguishable from *Flook*, and thus Diehr's claims were not patent eligible.[302] It asserted that "[i]n both cases, applicants seek to patent a process[,] the only novel feature of which is an algorithm embodied in a computer program."[303] All of the steps in Flook's claimed

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293.   *Id.* at 5.
294.   *Id.* at 6.
295.   *Id.*
296.   *Id.* at 1 (handwritten notes of Justice Powell).
297.   Certiorari Vote Tally Sheet, Diamond v. Diehr (No. 79-1112) (Mar. 14, 1980), *in Diehr* Case File, *supra* note 290, at 8.
298.   *Id.*
299.   *Id.*
300.   *Id.*
301.   Diamond v. Diehr, 445 U.S. 926, 926 (1980).
302.   *See* Brief for Petitioner, Diamond v. Diehr, 450 U.S. 175 (1981) (No. 79-1112), 1980 WL 339341, at *6 ("This case differs from *Parker v. Flook* in no significant way." (internal citation omitted)); *see also id.* at *7 ("This case is *Flook* revisited.").
303.   *Id.* at *6.

process, except for "actually programming the computer to control the already-known rubber molding process," were already well known in the field.[304] And the inclusion of post-solution activity—applying the algorithm in a particular context—was insufficient to transform Flook's claims into patent eligible subject matter, it contended.[305] Ultimately, the government asserted that the CCPA's decision should be reversed because it improperly refused to apply *Flook*, giving it an unduly narrow reading that "effectively confines *Flook* to its own facts."[306]

In response, Diehr first argued that the claimed invention was chemical and mechanical in nature, rather than mathematical.[307] The inventors were not attempting to patent an algorithm; rather, they used an algorithm in one of the steps in an industrial process to cure rubber.[308] Second, Diehr asserted the BPAI erred when it rejected the claims because novelty of the steps should not be considered under § 101.[309] Third, Diehr contended the BPAI should not have dissected the claim into novel and non-novel elements when considering patent eligibility.[310] Instead, the process should be assessed as a whole.[311] Diehr asserted that, unlike *Flook*, the claimed invention included novel steps other than the use of mathematical equations.[312] Finally, Diehr argued that the step of continuously measuring the internal temperature inside the mold is not within the prior art and therefore is patentable.[313]

A bench memorandum prepared by one of Justice Powell's law clerks on October 11, 1980, noted the central role of *Flook* in resolving the patent eligibility of Diehr's claims.[314] After a detailed discussion of *Flook*, including the dissenting opinion, and a summary of parties' arguments, the memorandum focused on whether *Flook* was correctly decided. The clerk stated that, in his view:

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304. *Id.* at *8–10.

305. *Id.* at *12–13.

306. *Id.* at *10–12.

307. Brief for Respondent, Diamond v. Diehr, 450 U.S. 175 (1981) (No. 79-1112), 1980 WL 339342, at *4.

308. *See id.* ("Diehr . . . do[es] not attempt to patent an algorithm . . . ."); *see also id.* at *28 ("[T]here can be no doubt that Diehr . . . seek[s] to patent a process, not an algorithm for a computer . . . .").
the idea itself.

309. *Id.* at *14–15.

310. *Id.* at *39–43.

311. *Id.* at *46.

312. *Id.* at *42–46.

313. *Id.* at *10, *18, *35.

314. Bench Memorandum to Justice Lewis F. Powell, Jr., Diamond v. Diehr (No. 79-1112), at 1 (Oct. 11, 1980), *in Diehr* Case File *supra* note 290, at 9 ("This case is confusing. But its resolution turns principally on an application of a single Supreme Court case, *Parker v. Flook* . . . .").

> [T]here was much merit to Justice Stewart's dissent in *Flook*. It seems
> to me that novelty ought to be irrelevant to the § 101 inquiry. . . . The
> inquiry under § 101 ought to be confined to examining whether the
> <u>subject matter</u> of the process is patentable, assuming novelty . . . . *Flook*
> involved the patentability of a process[,] the only novel element of
> which was a computer program. I would have thought that his patent
> should <u>not</u> have been denied as obvious under § 101, but rather under
> §§ 102 and 103. My view, however, seems to have been rejected by the
> Court (and by you) in *Flook* . . . .
>
>   . . .
>
> *Flook* imported considerations of novelty and obviousness into the § 101
> inquiry. Along with the three dissenters in that case, I think the Court—
> if it meant what it said—was wrong.[315]

The memorandum then discussed the impact of *Flook* at the USPTO and
lower courts, explaining that "the CCPA continues to treat [novelty and
nonobviousness] as irrelevant in the § 101 inquiry," and noting:

> The confusion that *Flook* has created in the patent office and the CCPA
> is manifested by this case. The patent office found that [Diehr]'s process
> was old because all of its aspects, including the placement of the
> thermometer and system of immediate calculations, were old. The
> CCPA treated novelty as irrelevant and reversed.[316]

The memorandum concluded by recommending that either the Court
either clarify *Flook* and affirm the CCPA, or remand to give the CCPA an
opportunity to review the BPAI's factual findings on novelty.[317]

In handwritten notes on this bench memorandum, Justice Powell
agreed that *Flook* controlled here.[318] However, he further noted that the
question "is what [*Flook*] holds [and] is it right[?]"[319] At the top of the
first page, Justice Powell noted that the memorandum was "[p]ersuasive
that my vote in *Flook* was [in] error."[320]

During a conference on October 17, 1980, following oral arguments,
the Justices tentatively agreed to affirm the CCPA in a 5–4 vote, thus
finding that Diehr's claim was patent eligible.[321] Below are each Justice's

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315.   *Id.* at 7–8.
316.   *Id.* at 8–9.
317.   *Id.* at 9.
318.   *Id.* at 1 (handwritten notes of Justice Powell).
319.   *Id*. (handwritten notes of Justice Powell).
320.   *Id.* (handwritten notes of Justice Powell).
321.   Justice Powell's Conference Notes, Diamond v. Diehr (No. 79-1112), at 1 (Oct. 17, 1980),
in Diehr Case File, *supra* note 290, at 23.

votes on patent eligibility,[322] along with a summary of Justice Powell's notes from the conference:

> Chief Justice (Burger): Patent eligible. "*Flook* does not control" because the "process claim" here involved "transforming uncured rubber into seals to prevent oil leakage." In contrast, "*Flook* dealt with a computer program." Diehr's process "involves transformation of material into [a] different state" and thus is "[m]uch more than some abstract principle." "We should not read § 101 narrowly. It is intended to encourage innovation."

> Justice Brennan: Not patent eligible. "*Flook* can't be distinguished."

> Justice Stewart: Patent eligible. Agreed with the Chief Justice.

> Justice White: Patent eligible. Also agreed with the Chief Justice. "Closer case than *Bradley*—but *Flook* doesn't control." Noted that the Court "[d]o[es]n't need to reach J[udge] Rich's erroneous language."

> Justice Marshall: Not patent eligible. No further notes.

> Justice Blackmun: Not patent eligible. A short but incomplete note regarding Justice Blackmun's views mentioned the "mere presence of a computer process doesn't" without further elaboration.

> Justice Powell: Patent eligible. Justice Powell noted that he "agreed with much of what [the Chief Justice] and [Justice White] said." "The claimed invention involves use of a computer to calculate temperatures <u>continuously</u> in the process of molding rubber by <u>heat</u> . . . . Not a machine, but [it] is a <u>process</u> or <u>method</u> involving computer [and] programming. [Diehr's] process has significant cost advantages. The method of 'continuous measuring' is [the] only patentable feature." Justice Powell also noted that "[y]ears of experimentation & large investment has gone into" Diehr's invention. "Despite *Flook*, novelty should be irrelevant under § 101."

> Justice Rehnquist: Patent eligible. Diehr claimed a "[n]ew and useful invention." Regarding patentable subject matter, "this is 'exactly what [p]atent [l]aw is about.' *Flook* did not exclude <u>all</u> computer processes."

> Justice Stevens: Not patent eligible. He voted to "[r]everse or remand." "This is a prior art patent for 15 claims. Only claim 16 purports to be new, and as to this the computer is used to do more efficiently. . . . [T]he

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322.   For *Diehr*, a vote in favor of patent eligibility was a vote to affirm the CCPA, while a vote against patent eligibility was a vote to reverse the CCPA.

[claimed] process is simply a <u>faster</u> way to do something that was not new."[323]

Justice Rehnquist circulated a first draft of the majority opinion on November 13, 1980.[324] In handwritten notes on the first page of his copy of the draft, Justice Powell noted that the opinion distinguished both *Benson* and *Flook*, and that "§ 102—not § 101—addresses 'novelty,'" which was "not decide[d]" here.[325] Justice Powell indicated that he would "probably join" Justice Rehnquist's opinion, which he ultimately did. The final, published version of Justice Rehnquist's opinion for the Court in *Diehr* is identical to this first draft, except for a handful of apparently stylistic changes.

4. Court's Decision

The Court's decision in *Diehr* was released on March 3, 1981.[326] After summarizing the claimed invention and procedural history, Justice Rehnquist's opinion for the majority began with a summary of the history of § 101, including the definition of a patentable process.[327] It then quoted a statement from *Benson* that "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines," and declared that "we think that a physical and chemical process for molding synthetic rubber products falls within the § 101 categories of possibly patentable subject matter" because Diehr's claims "involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing."[328] The Court's opinion emphasized the industrial nature of the claimed process and the use of a tangible apparatus to practice it, including the steps of "installing rubber in a press, closing the mold, . . . and automatically opening the press at the proper time."[329]

The majority then attempted to distinguish Diehr's claim invention from both *Benson* and *Flook*, stating that "[o]ur conclusion . . . is not

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323. Justice Powell's Conference Notes, *supra* note 321, at 1–3, *in Diehr* Case File, *supra* note 290, at 23–25.

324. First Draft, Opinion for the Court, Diamond v. Diehr (No. 79-1112) (circulated Nov. 13, 1980), *in Diehr* Case File, *supra* note 290, at 27–43.

325. *Id.* at 1 (handwritten notes of Justice Powell).

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

327. *Id.* at 181–84.

328. *Id.* at 184 (quoting Gottschalk v. Benson, 409 U.S. 63, 70 (1972)).

329. *Id.* at 187; *see also id.* at 192–93 ("Because we do not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial process for the molding of rubber products, we affirm the judgment of the Court of Customs and Patent Appeals.").

altered by the fact that in several steps of the process a mathematical equation and programmed digital computer are used."[330] It contended that *Benson* and *Flook* stood for "no more than the[] long-established principles" that "laws of nature, natural phenomena, and abstract ideas," by themselves, are not patentable.[331] In contrast, Diehr

> do[es] not seek to patent a mathematical formula. Instead, [respondents] seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.[332]

Citing *Le Roy*, *Morse*, *Mackay Radio*, and *Funk Brothers*, the Court contended that "an *application* of a law or nature or mathematical formula to a known structure or process may well be deserving of patent protection."[333] Here, "Arrhenius' equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101."[334]

Reflecting Justice Powell's concerns about conflating patent eligibility under § 101 with novelty under § 102, the Court's opinion then explained:

> In determining the eligibility of [a] claimed process for patent protection under § 101, [the] claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.
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> It has been urged that novelty is an appropriate consideration under § 101. . . . 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

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330.   *Id.* at 185.
331.   *Id.*
332.   *Id.* at 187.
333.   *Id.* at 187–88.
334.   *Id.* at 188.

> 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."[335]

The Court concluded by reiterating that Diehr's invention was patent eligible under § 101 because it was "a process for molding rubber products and not . . . an attempt to patent a mathematical formula."[336]

The four dissenting Justices, in an opinion written by Justice Stevens (who authored the majority opinion in *Flook*), contended that Diehr's process was indistinguishable from the process found ineligible in *Flook*:

> A fair reading of the entire patent application, as well as the specific claims, makes it perfectly clear that what Diehr . . . claim[s] to have discovered is a method of using a digital computer to determine the amount of time that a rubber molding press should remain closed during the synthetic rubber-curing process. . . . What they claim to have discovered, in essence, is a method of updating the original estimated curing time by repetitively recalculating that time pursuant to a well-known mathematical formula in response to variations in temperature within the mold. Their method of updating the curing time calculation is strikingly reminiscent of the method of updating alarm limits that Dale Flook sought to patent.
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> . . .
>
> The essence of the claimed discovery in both cases was an algorithm that could be programmed on a digital computer. In *Flook*, the algorithm made use of multiple process variables; in this case, it makes use of only one. In *Flook*, the algorithm was expressed in a newly developed mathematical formula; in this case, the algorithm makes use of a well-known mathematical formula. Manifestly, neither of these differences can explain today's holding.[337]

The dissent also criticized at length the CCPA's patent eligibility decisions after *Benson* and *Flook*, contending the lower court had inappropriately given both cases a narrow reading.[338] Finally, it again suggested that "[t]he broad question whether computer programs should

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335. *Id.* at 188–190.

336. *Id.* at 191; *see also id.* at 192–93 ("Because we do not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial process for the molding of rubber products, we affirm . . . .").

337. *Id.* at 208–211 (Stevens, J., dissenting).

338. *Id.* at 198–205 (Stevens, J., dissenting); *see also id.* at 204 (Stevens, J., dissenting) (noting that "*Flook* was not enthusiastically received by" the CCPA and that its "reading of *Flook* . . . trivializes [its] holding").

be given patent protection involves policy considerations" better directed to Congress than the courts.[339]

E.   Diamond v. Bradley

   1. Facts and Procedural History

On April 21, 1975, John J. Bradley and Benjamin S. Franklin (Bradley), who were both employees of Honeywell, filed a patent application for a "Switch System Base Mechanism."[340] The claimed invention covered a system for more efficiently managing the operation of a digital computer in a multiprogram format, "in which the computer is capable of executing more than one program, and thus perform more than one application at the same time, without the need to reprogram the computer for each task."[341] According to the patent application, this is achieved by storing certain information in scratchpad registers[342] located in the computer's central processing unit (CPU), rather than in main memory, which significantly improves the computer's speed of operation.[343] One drawback of this approach, however, was that information stored in the scratchpad register was difficult to change because it could not be directly accessed by software, and thus was effectively invisible to programmers.[344] Bradley's invention overcame this problem by storing system information in "firmware"[345] that controls data transfers between the scratchpad registers and main memory.[346]

The examiner rejected the claimed invention under *Benson*, on the grounds that the invention was a "data structure" or algorithm designed to control a multiprogrammed computer.[347] Following the Supreme Court's

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   339.   *Id.* at 216–17 (Stevens, J., dissenting).
   340.   *In re* Bradley, 600 F.2d 807, 808 (C.C.P.A. 1979).
   341.   *Id.*
   342.   A scratchpad register is "a plurality of multibit storage locations, usually located in the central processing unit (CPU) of a computer, used for temporary storage of program information, operands, and calculation results for use by the computer's arithmetic and logic unit, and other information of a temporary nature." *Id.* at 808 n.1.
   343.   *Id.* at 808.
   344.   *Id.*
   345.   Firmware is software that is programmed into non-volatile memory chips or devices, meaning that it is not deleted when power to a device is turned off, unlike random-access memory. *See* Jacqueline Emigh, *RAM vs. ROM Differences*, ENTERPRISE STORAGE FORUM (July 19, 2019), https://www.enterprisestorageforum.com/storage-hardware/ram-vs-rom.html [https://perma.cc/QRD8-8WYQ].
   346.   *In re Bradley*, 600 F.2d at 808–09; *see also* U.S. Patent No. 4,351,024 (issued Sept. 21, 1982) (further describing the claimed invention).
   347.   *In re Bradley*, 600 F.2d at 809–10.

decision in *Flook*, the BPAI affirmed, concluding that the only novel part of the claimed invention resided in the programming, which was directed to a method of calculation or an algorithm.[348] It reasoned that "a claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under 35 U.S.C. § 101 [and] *Flook*."[349]

On appeal, the CCPA unanimously reversed, holding that the claimed invention was a patent-eligible machine or apparatus.[350] In an opinion by Judge Rich, the CCPA contended that the "structural hardware elements" in the claimed invention, "such as registers, portions of main memory, and . . . other computer components," fall within the literal scope of § 101.[351] In other words, the invention "claim[s] a combination of hardware elements, one of which happens to be a portion of the computer's control store microprogrammed in a particular manner," and "the particular information acted upon by [the] invention is irrelevant."[352] The court found *Benson* and *Flook* distinguishable, as Bradley's invention did not preempt use of an algorithm, nor did it solve a specific mathematical equation.[353]

2. Petition for Writ of Certiorari

On December 3, 1979, the USPTO filed a petition for writ of certiorari to the Supreme Court.[354] In its petition, the USPTO argued that the CCPA's decision was "squarely at odds with *Flook*" because "Bradley's claim, however artfully described, seeks a patent on an algorithm, for everything else in his claim is old and not . . . inventive."[355] In response, Bradley argued that *Flook* was not applicable because the claimed invention "comprises a computer hardware machine . . . including a firmware element," and "no algorithm is claimed."[356]

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348.   *Id.* at 810–11.

349.   *Id.* at 811.

350.   *Id.* at 812.

351.   *Id.*

352.   *Id.*

353.   *Id.* at 813.

354.   Petition for Writ of Certiorari, Diamond v. Bradley, 450 U.S. 381 (1981) (No. 79-855), 1979 U.S. S. Ct. Briefs LEXIS 1363.

355.   *Id.* at *11; *see also id.* at *13 ("Bradley's program . . . is no more patentable than the algorithms involved in *Benson* and *Flook*. Like programs generally, Bradley's program is a set of directions to the computer. It commands the switching of data, of whatever type, untied to any particular end use.").

356.   Brief in Opposition to Writ of Certiorari, Diamond v. Bradley, 450 U.S. 381 (1981) (No. 79-855), 1980 WL 339233, at *11, *19.

A memorandum circulated by the cert pool clerk recommended granted certiorari.[357] After summarizing the facts, the procedural history, and the parties' arguments, the memorandum contended that "[a]ssuming that the directions on the firmware are unpatentable, . . . *Flook* seems to require rejection of the application under [§] 101, if the rest of the claimed invention is old in the art."[358] After raising and quickly dismissing two other options—holding *Bradley* and *Diehr* for *Chakrabarty* (which was pending) or summarily reversing the CCPA (as an "indication . . . that insubordination will not be tolerated")—the memorandum argued that granting certiorari was the "best solution" because "[t]he CCPA has gone far out on a limb in expressing its view that the Court did not anticipate the consequences of *Flook*," and "[s]uch strong statements of disagreement from a court with some expertise in the area probably merit full plenary consideration."[359] In a handwritten note on the first page of the memorandum, Justice Powell's own law clerk appeared to agree with this assessment, stating: "I would grant. The CCPA is purposefully disregarding *Flook*."[360] Justice Powell's own handwritten note on the memorandum noted that "[Solicitor General] says [CCPA] failed to follow *Parker v. Flook*" and that he would vote to grant certiorari.[361]

In a conference on March 14, 1980, Justices Blackmun, Powell, Stevens, and White voted to grant certiorari.[362] Justice Stewart voted to "join three," while Chief Justice Burger and Justices Brennan, Marshall, and Rehnquist voted to deny certiorari.[363] The Supreme Court formally granted the petition for certiorari on March 17, 1980, and ordered the case to be set for oral argument in tandem with *Diehr*.[364]

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357.   Supreme Court Case File, Diamond v. Bradley, No. 79-855 (1981), *in* Lewis F. Powell Jr. Archive,   Box   531/Folder   8   [hereinafter   *Bradley*   Case   File], https://scholarlycommons.law.wlu.edu/casefiles/646/ [https://perma.cc/ PB2A-KVUK].

358.   Preliminary Memorandum, Diamond v. Bradley (No. 79-855), at 7 (Feb. 27, 1980), *in Bradley* Case File, *supra* note 357, at 8.

359.   *Id.* at 8.

360.   *Id.* at 1 (handwritten notes of Justice Powell's law clerk).

361.   *Id.* (handwritten note of Justice Powell).

362.   Certiorari Vote Tally Sheet, Diamond v. Bradley (No. 79-855) (Mar. 14, 1980), *in Bradley* Case File, *supra* note 357, at 10.

363.   *Id.*

364.   Diamond v. Bradley, 445 U.S. 926, 926 (1980).

3. Merits Stage

In its briefing, the government argued that under *Benson* and *Flook*, "traditional computer programs—i.e., software—are unpatentable."[365] Citing Stephen Breyer's now-famous article on the copyrightability of software,[366] it contended that every algorithm implemented by a computer is the expression of a fundamental idea, and permitting the patenting of a computer program would be akin to permitting a patent on the idea itself.[367] The fact that Bradley's invention stored the program "in firmware rather than traditional software is of no legal significance," it asserted, because "[t]he algorithm is no less abstract when being claimed as part of firmware."[368] Second, the government argued that under *Flook*, the claimed invention is not patentable because, after stripping the unpatentable program, all of the remaining hardware components were old, according to both the examiner and the BPAI.[369]

In response, Bradley argued that the claimed invention is a machine, rather than a computer program or algorithm, and thus is patentable subject matter under § 101.[370] Bradley contended that the claimed invention "is one of a series of inventions which collectively define an entirely new computer machine which is now being commercially marketed worldwide," and the specific invention at issue is a machine under § 101 because it consists of a variety of hardware, including "register elements, hardware gates, logic circuits, and memory elements," that are "permanently incorporated into . . . the computer" and improve its efficiency.[371] Respondent argued the USPTO erred in contending that the invention was merely an unpatentable algorithm or method of calculation, and in fact the patent application does not claim any particular algorithm.[372] Furthermore, Bradley contended the USPTO was effectively denying patent protection for any computer-related invention, which is contrary to *Benson* and *Flook*.[373] Finally, Bradley asserted that the USPTO

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365. Brief for Petitioner, Diamond v. Bradley, 450 U.S. 381 (1981) (No. 79-855), 1980 WL 339235, at *12.

366. Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 341–42 (1970).

367. Brief for Petitioner, *supra* note 365, at *12–14.

368. *Id.* at *19.

369. *Id.* at *20–22.

370. Brief for Respondents, Diamond v. Bradley, 450 U.S. 381 (1981) (No. 79-855), 1980 WL 339238, at *2–5.

371. *Id.* at *1–2.

372. *Id.* at *6–8.

373. *Id.* at *22–32.

improperly imported novelty and nonobviousness issues into the § 101 analysis.[374]

In a bench memorandum, one of Justice Powell's law clerks concluded that "[a]lthough this case and *Diehr* involve different fact[s] . . . the cases are very similar" because "they each have elements apart from the computer that, when applied, perform useful functions."[375] The clerk recommended that this case reach the same outcome as *Diehr* and "clarify *Flook* and explain that novelty is irrelevant under § 101."[376] In a handwritten note on the first page of this memorandum, Justice Powell noted that this is "a close [and] difficult [question] whether [the] CCPA has misapplied *Flook*."[377] In addition, in a separate handwritten note before conference, Justice Powell noted that "[t]here is troublesome language in *Flook* suggesting that § 101 is concerned both with patentability <u>and</u> novelty . . . [b]ut [the] structure of [the Patent] Act indicates these are separate issues."[378]

During a conference on October 17, 1980, after oral argument, the Justices initially voted to affirm 5–3, but Justice Brennan subsequently switched his position, ultimately resulting in a 4–4 tie.[379] Chief Justice Burger recused himself from the case.[380] Below are each Justice's votes on patent eligibility,[381] along with a summary of Justice Powell's notes from the conference:

<u>Chief Justice Burger</u>: Recused.

<u>Justice Brennan</u>: Not patent eligible. Initial vote to "[a]ffirm tentatively." "Await [Justice Stevens]'s views, but [he] thinks *Flook* is distinguishable" because the "[i]nvention here is a machine." "After further consideration, [Justice Brennan] voted to reverse."

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374.   *Id.* at *32.

375.   Bench Memorandum to Justice Lewis F. Powell, Jr., Diamond v. Bradley (No. 79-855), at 5–6 (Oct. 11, 1980), *in Bradley* Case File, *supra* note 357, at 15–16.

376.   *Id.* at 6.

377.   *Id.* at 1 (handwritten notes of Justice Powell).

378.   Justice Powell's Pre-Conference Handwritten Note, Diamond v. Bradley (No. 79-855), *in Bradley* Case File, *supra note* 357, at 20.

379.   Justice Powell's Conference Notes, Diamond v. Bradley (No. 79-855), at 1–3 (Oct. 17, 1980), *in Bradley* Case File, *supra note* 357, at 21–23. The handwritten notes at the top of Justice Powell's notes on this conference state "Affirm 5–3," which is then crossed out, and "Affirmed 4–4" is written immediately below, with a note that "WJB [Justice Brennan] changed vote." *Id.* at 1.

380.   *Id.* at 1. The reason for Chief Justice Burger's recusal in *Bradley* are not clear from Justice Powell's records—his notes on the conference simply mention that the Chief Justice was "out." *Id.*

381.   For *Bradley*, a vote in favor of patent eligibility was a vote to affirm the CCPA, while a vote against patent eligibility was a vote to reverse.

Justice Stewart: Patent eligible. "[Government]'s view of *Flook* is far too broad. It is that whenever an invention involves computer programming, it is not patentable. Too extreme. Novelty issue not here."

Justice White: Patent eligible. "Untenable to say can't patent anything if a computer program is involved. J[udge] Rich misinterpreted *Flook*—but we don't need to decide [the] case on this basis. We certainly have not said all computer programs are unpatentable."

Justice Marshall: Not patent eligible. "*Flook* controls. It means what it says."

Justice Blackmun: Not patent eligible. "The original claims didn't embrace a machine, and amend[ed] claims didn't change this. This is a computer program." He also stated that "*Flook* should not be reconsidered."

Justice Powell: Patent eligible. "I am respectful of the expertise of [the] CCPA—an expertise I do not have. Thus, if five other Justices think we can fairly distinguish *Flook*—as I think we can—I'll affirm. My own inexpert judgment is that this <u>is</u> different from Flook. Here this is a machine according to claims accepted, and patent is <u>narrowly</u> limited."

Justice Rehnquist: Patent eligible. This is a "[s]tatutory area—<u>stare decisis</u> usually applies. Problem is in [*Benson*]. Decision in *Flook* is in accord with that case." He also noted that "an 'algorithm is a 'problem,'" and "[a]n answer or solution should be patentable."

Justice Stevens: Not patent eligible. He voted to "[r]everse or [r]emand." This is a "[d]ifficult case to understand. J[udge] Rich at CCPA has misapplied *Flook*. . . . In *Flook*, a non-patentable principle can't be the sole basis of what is claimed as an invention. Should remand for CCPA to reconsider (again) in light of *Flook*."[382]

4. Resolution

Following the tied vote at conference, the Court issued a short *per curiam* order on March 9, 1981, stating that the CCPA's judgment was affirmed by an equally divided Court, and that Chief Justice Burger took no part in considering or deciding the *Bradley* case.[383] As a result, the Court's decision lacked precedential value.[384]

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382. *Id.* at 1–3.

383. Diamond v. Bradley, 450 U.S. 381, 381 (1981) (per curiam).

384. "[A]n affirmance by an equally divided Court is not entitled to precedential weight." Ark. Writers' Project, Inc. v. Ragland, 481 U.S. 221, 234 n.7 (1987) (citing Neil v. Biggers, 409 U.S. 188, 192 (1972)); *see also* Justin Pidot, *Tie Votes in the Supreme Court*, 101 MINN. L. REV. 245, 252

IV. 1982 AND BEYOND: THE CONTINUING SIGNIFICANCE OF THE BURGER COURT'S PATENT ELIGIBILITY DECISIONS

This Part summarizes the development of the law regarding patent eligibility since the Burger Court's decisions. It begins with the Federal Circuit, which stepped into the gap after *Diehr* and significantly broadened patent eligibility in a series of decisions.[385] It then addresses the Supreme Court's return to the issue of patent eligibility and its heavy reliance on the Burger Court decisions to find patents on methods of financial transactions and genetic information ineligible. Finally, it summarizes lower court citations to the Burger Court's patent eligibility decisions as another measure of their continuing impact in current patent eligibility jurisprudence.

A. The Federal Circuit Takes Charge

As the Supreme Court retreated from the issue of patent eligibility after *Diehr* for over 25 years, the Federal Circuit stepped in to fill the void. Created in 1982 in the wake of longstanding complaints that the regional circuits reached inconsistent outcomes and were often hostile to patentees, Congress intended the Federal Circuit to "insure[] a more uniform interpretation of the patent laws and thus contribut[e] meaningfully and positively to predicting the strength of patents."[386] The Federal Circuit is the successor to the CCPA, and upon its enactment, all of the judges on the CCPA court became judges on the new Federal Circuit.[387]

Following *Flook* and *Diehr*, the CCPA articulated a two-part test regarding the patenting of inventions that included an algorithm known as the *Freeman–Walter–Abele* test.[388] As subsequently explained by the Federal Circuit:

(2016) ("The Supreme Court has long applied the rule that where the Justices reach a tie vote on the judgment in a case, the lower court's opinion is affirmed. Such a decision binds the parties, but has no precedential value.").

385. *See, e.g.*, State St. Bank & Tr. Co. v. Signature Fin. Grp., 149 F.3d 1368 (Fed. Cir. 1998).

386. Ryan T. Holte & Christopher B. Seaman, *Patent Injunctions on Appeal: An Empirical Study of the Federal Circuit's Application of* eBay, 92 WASH. L. REV. 145, 165 (2017) (quoting *Hearings on H.R. 6033, H.R. 6934, H.R. 3806, and H.R. 2414, Before the Subcomm. on Courts, Civil Liberties, & the Admin. of Justice of the H. Comm. on the Judiciary*, 96th Cong. 797 (1980), http://njlaw.rutgers.edu/collections/gdoc/hearings/8/81602054/81602054_5.pdf [https://perma.cc/PGA5-JUVL]; *see also* Richard H. Seamon, *The Provenance of the Federal Courts Improvement Act of 1982*, 71 GEO. WASH. L. REV. 543, 551–73 (2003) (describing the creation and purpose of the Federal Circuit).

387. Seamon, *supra* note 386, at 570.

388. *In re* Freeman, 573 F.2d 1237, 1245 (C.C.P.A. 1978); *In re* Walter, 618 F.2d 758, 765–68 (C.C.P.A. 1980); *In re* Abele, 684 F.2d 902, 905–07 (C.C.P.A. 1982).

> It is first determined whether a mathematical algorithm is recited directly or indirectly in the claim. If so, it is next determined whether the claimed invention as a whole is no more than the algorithm itself; that is, whether the claim is directed to a mathematical algorithm that is not applied to or limited by physical elements or process steps. Such claims are nonstatutory. However, when the mathematical algorithm is applied to one or more elements of an otherwise statutory process claim, . . . the requirements of section 101 are met.[389]

In one of its first acts, the Federal Circuit adopted the CCPA's decisions as binding precedent.[390] The Federal Circuit continued to periodically employ the *Freeman–Walter–Abele* test[391] until it was criticized in *State Street Bank*[392] and ultimately rejected by the en banc decision in *In re Bilski*.[393]

In 1994, the Federal Circuit further broadened the patenting of computer software in *In re Alappat*, holding that an apparatus that used mathematical calculations to help render smooth and continuous lines on an display screen was patentable subject matter.[394] It reasoned that under *Diehr*, patent protection was barred when "the claimed subject matter as a whole is a disembodied mathematical concept."[395] If the claim included "a specific machine to produce a useful, concrete, and tangible result," it could be patent eligible.[396] The following year, the USPTO issued examination guidelines that effectively made any computer software patentable, so long as it was embodied in a storage medium.[397]

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389.   *In re* Schrader, 22 F.3d 290, 292 (Fed. Cir. 1994).

390.   S. Corp. v. United States, 690 F.2d 1368, 1370–71 (Fed. Cir. 1982).

391.   *See, e.g.*, *In re Schrader*, 22 F.3d at 290 (Fed. Cir. 1994); Arrythmia Research Tech., Inc. v. Corazonix Corp., 958 F.2d 1053, 1058 (Fed. Cir. 1992); *In re* Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989).

392.   State St. Bank & Tr. Co. v. Signature Fin. Grp., 149 F.3d 1368, 1374 (Fed. Cir. 1998). ("After Diehr and Chakrabarty, the *Freeman–Walter–Abele* test has little, if any, applicability to determining the presence of statutory subject matter.").

393.   *In re* Bilski, 545 F.3d 943, 959 (Fed. Cir. 2008) (en banc).

394.   *In re* Alappat, 33 F.3d 1526, 1543–44 (Fed. Cir. 1994).

395.   *Id.* at 1544 (emphasis removed).

396.   *Id.*; *see also id.* at 1545 ("We have held that [software] programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software. . . . Consequently, a computer operating pursuant to software *may* represent patentable subject matter, provided, of course, that the claimed subject matter meets all the other requirements of Title 35.").

397.   *See* John R. Thomas, *Patenting the Liberal Professions*, 40 B.C. L. REV. 1139, 1154–55 (1999); Robert Greene Sterne & Lawrence B. Bugaisky, *The Expansion of Statutory Subject Matter Under the 1952 Patent Act*, 37 AKRON L. REV. 217, 223 (2004) (explaining that court decisions and USPTO guidance "opened the doorway to patentability so wide that inventors can now, in effect, patent any computer software provided that it is embodied in a medium such as a diskette").

In 1999, the Federal Circuit held in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* that methods of doing business were eligible for patent protection.[398] The claimed invention in *State Street* was a data processing system for implementing a hub and spoke investment structure, where mutual funds (spokes) pooled their assets in a portfolio (hub), which offered efficiency and tax advantages.[399] This patent was found invalid by the district court as an ineligible mathematical algorithm in light of *Benson* and the *Freeman-Walter-Abele* test.[400] As an alternative ground, the district court also invalidated the patent-in-suit as an unpatentable business method.[401] On appeal, however, the Federal Circuit reversed on both issues. First, it held the transformation of data by a machine constitutes a practical application of an algorithm because it produces a "useful, concrete, and tangible result."[402] Second, it rejected the "so-called 'business method' exception to [patentable] subject matter," holding that "[s]ince the 1952 Patent Act, business methods have been . . . subject to the same legal requirements of patentability as any other process or method."[403] These decisions helped open the floodgates to the patenting of computer-related inventions.[404] Ultimately, the USPTO issued thousands of patents for computer software, including data structures, methods for performing calculations, data compression algorithms, and software-based encryption.[405]

Regarding biotechnology, the lower courts and the USPTO adhered to an expansive view of patent eligibility following *Chakrabarty*. In 1987, the BPAI overturned the examiner's rejection of a patent application for a genetically-modified oyster under § 101,[406] which the Federal Circuit allowed to stand.[407] The following year, the USPTO granted a patent on the first transgenic animal, the "Harvard Mouse,"[408] which is widely used

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398.   State St. Bank & Tr. Co. v. Signature Fin. Grp., 149 F.3d 1368, 1375–76 (Fed. Cir. 1998).

399.   *Id.* at 1370.

400.   State St. Bank & Tr. Co. v. Signature Fin. Grp., 927 F. Supp. 502, 508–14 (D. Mass. 1996).

401.   *Id.* at 514–17.

402.   *State St.*, 149 F.3d at 1375.

403.   *Id.*

404.   *See* Osenga, *supra* note 25, at 1089–90; Thomas, *supra* note 397, at 1153.

405.   *See* Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 9–12 (2001).

406.   *Ex parte* Allen, 2 U.S.P.Q.2d 1426 (BPAI 1987) (holding that the claimed polyploid oysters were patent eligible under § 101 and *Chakrabarty* because they were "non-naturally occurring manufactures or compositions of matter," but affirming the examiner's rejection of the claims as obvious under § 103).

407.   *In re* Allen, 927 F.2d 1565 (Fed. Cir. 1988). The Court's unpublished opinion in *Allen* focused on the nonobviousness issue.

408.   Transgenic Non-human Mammals, U.S. Patent No. 4,736,866 (issued Apr. 12, 1988).

in clinical trials for cancer research. This was followed by patents on other transgenic animals, including chickens, cows, dogs, and monkeys.[409] In addition, the USPTO granted patents on genetically-modified crops[410] and embryonic stem cells.[411] Ultimately, thousands of biotechnology patents were granted each year during the 1990s.[412]

In sum, the Federal Circuit's decisions in the 1980s and 1990s seemingly eviscerated any meaningful limits on patent eligibility.[413] The broad conception of patent eligibility adopted by the Court in *Chakrabarty* and *Diehr* had apparently won out, and the USPTO rarely denied patents on grounds that they were drawn to ineligible subject matter.[414]

B.   *The Supreme Court Returns to the Bar of Patent Eligibility*

Yet even as patent eligibility reached its high-water mark in the late 1990s and early 2000s, the tide begun started to shift, led by the Supreme Court. Consistent with its increased engagement with patent law more generally,[415] in 2006, several members of the Court expressed an interest in re-examining the scope of patentable subject matter in *Laboratory Corp. of America v. Metabolite Laboratories, Inc.*[416] The Supreme Court granted a writ of certiorari in *LabCorp* on the issue of whether the claimed method—which detected a deficiency of certain vitamins in warm-

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409.   *See, e.g.*, Avian Embryonic Stem Cells, U.S. Patent No. 5,656,479 (issued Aug. 12, 1997) (chicken); Transgenic Non-human Mammal Milk Comprising 2'-fucosyl-lactose, U.S. Patent No. 5,750,176 (issued May 12, 1998) (cow); Chimeric Protein that has a Human Rho Motif and Deoxyribonuclease Activity, U.S. Patent No. 5,489,524 (issued Feb. 6, 1996) (monkey).

410.   *See, e.g.*, Estrification Process of Fats and Oils and Ezymatic Prepartion to Use Therein, U.S. Patent No. 4,940,845 (issued Jul. 10, 1990); Glyphosphate-resistant Plants, U.S. Patent No. 5,188,642 (issued Feb. 23, 1993) (crops).

411.   *See, e.g.*, Primate Embryonic Stem Cells, U.S. Patent No. 6,200,806 (issued Mar. 13, 2001).

412.   *See* Robinson & Medlock, *supra* note 30, at 13.

413.   One widely-cited article succinctly summarized this with its title, "Everything is Patentable." *See* Michael Risch, *Everything is Patentable*, 75 TENN. L. REV. 591 (2008).

414.   One of the few exceptions is *In re* Nuijten, 500 F.3d 1346 (Fed. Cir. 2007), where the examiner rejected a claim for including "watermarks" into digital audio files. This outcome was upheld on appeal by the Federal Circuit, which found in a 2–1 decision that the claimed invention did not fit into any of the statutory categories for patent eligibility in § 101. *Id.* at 1348.

415.   *See* John F. Duffy, *The* Festo *Decision and the Return of the Supreme Court to the Bar of Patents*, 2002 SUP. CT. REV. 273, 283 (explaining that although the Court had decided very few patent cases in the second half of the twentieth century, the Court's increased number of patent cases since then reflected that it was "increasingly comfortable in reviewing patent decisions and increasingly interested in directing the development of the law in the field"); *see generally* Paul R. Gugliuzza, *The Supreme Court Bar at the Bar of Patents*, 95 NOTRE DAME L. REV. 1233 (2020) (examining the Supreme Court's increased involvement in patent case and potential drivers of that trend).

416.   Lab. Corp. of Am. v. Metabolite Labs., Inc., 548 U.S. 124, 125–39 (2006) (Breyer, J., dissenting).

blooded animals using an assay of bodily fluid for an elevated level of
total homocysteine, and correlating that elevated level with the amount of
vitamin deficiency—was patent eligible because it was drawn to a "basic
scientific relationship in used in medical treatment such that any doctor
necessarily infringes merely by thinking about the relationship after
looking at a test result,"[417] but it later dismissed the writ as improvidently
granted, apparently due to a procedural flaw that the patentable subject
matter issue had not been adequately raised and analyzed by the lower
courts.[418] In a lengthy dissent, Justice Breyer, joined by Justices Stevens
and Souter, argued that the patent eligibility issue was important and
should be decided.[419] Citing *Benson, Flook*, and *Diehr*, Justice Breyer
asserted that the patent merely claimed a "natural phenomenon" because
it "amount[ed] to a simple natural correlation" between the measured
value of an amino acid and the amount of vitamin deficiency.[420] Justice
Breyer then raised various policy concerns about patent rights for medical
diagnostic and treatment methods more generally, including the financial,
transactional, and social costs of such patents.[421]

    Between 2010 and 2014, the Court decided four major patent
eligibility decisions, starting with *Bilski v. Kappos*[422] and culminating
with *Alice Corp. v. CLS Bank*.[423] Much ink has already has spilled in the
scholarly literature on these decisions and their ramifications,[424] so this

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    417.   Petition for Writ of Certiorari at i, Lab. Corp. of Am. v. Metabolite Labs., Inc., 548 U.S.
124 (2006) (No. 04-607), 2004 WL 2505526; Lab. Corp. of Am. v. Metabolite Labs., Inc., 546 U.S.
999, 999 (2005) (granting certiorari on question 3 of the petition).
    418.   *Lab. Corp.*, 548 U.S. at 125.
    419.   *Id.* at 125–39 (Breyer, J., dissenting).
    420.   *Id.* at 135–37 (Breyer, J., dissenting).
    421.   *Id.* at 132–34, 138–39 (Breyer, J., dissenting).
    422.   Bilski v. Kappos, 561 U.S. 593 (2010).
    423.   Alice Corp. v. CLS Bank, 573 U.S. 208 (2014).
    424.   *See generally* J. Jonas Anderson, *Applying Patent-Eligible Subject Matter Restrictions*, 17
VAND. J. ENT. & TECH. L. 267 (2015); Bernard Chao, *Moderating* Mayo, 107 NW. U. L. REV.
COLLOQUY 82 (2012); Tun-Jen Chiang, *Competing Visions of Patentable Subject Matter*, 82 GEO.
WASH. L. REV. 1858 (2014); Andrew Chin, *Ghost in the "New Machine": How* Alice *Exposed
Software Patenting's Category Mistake*, 16 N.C. J.L. & TECH. 623 (2015); Rochelle C. Dreyfuss &
James P. Evans, *From* Bilski *Back to* Benson*: Preemption, Inventing Around, and the Case of Genetic
Diagnostics*, 63 STAN. L. REV. 1349 (2011); John F. Duffy, *Why Business Method Patents?*, 63 STAN.
L. REV. 1247 (2011); Eisenberg, *supra* note 15; Robin Feldman, *Whose Body Is It Anyway? Human
Cells and the Strange Effects of Property and Intellectual Property Law*, 63 STAN. L. REV. 1377
(2011); Golden, *supra* note 2; Holman, *supra* note 15; Lefstin, *supra* note 18; Mark A. Lemley et al.,
Life After Bilski, 63 STAN. L. REV. 1315 (2011); Kevin Madigan & Adam Mossoff, *Turning Gold
Into Lead: How Patent Eligibility Doctrine is Undermining U.S. Leadership in Innovation*, 24 GEO.
MASON L. REV. 939 (2017); Peter S. Menell, *Forty Years of Wondering in the Wilderness and No
Closer to the Promised Land:* Bilski*'s Superficial Textualism and the Missed Opportunity to Return
Patent Law to Its Technology Mooring*, 63 STAN. L. REV. 1289 (2011); Osenga, *supra* note 18; Joshua
D. Sarnoff, *Patent-Eligible Inventions After* Bilski*: History and Theory*, 63 HASTINGS L.J. 53 (2011);

Article will not duplicate this work by recounting each case in full. But it will briefly discuss how the Court applied and/or relied upon Burger Court precedents to reach its decisions.

Bilski involved a patent application claiming a method of hedging against risk through a series of transactions involving commodities.[425] The examiner rejected the application because it "merely manipulates [an] abstract idea" that was "not implemented on a specific apparatus," and the BPAI affirmed.[426] Sitting en banc, the Federal Circuit overruled its "useful, concrete, and tangible result" test in *State Street*, instead holding that a claimed process was patent eligible if "(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing."[427] The Federal Circuit majority's opinion extensively discussed and relied on *Benson*, *Flook*, and especially *Diehr*, in adopting the machine-or-transformation test for patent eligibility.[428] The Supreme Court unanimously held Bilski's claimed method was not patentable subject matter.[429] Citing *Benson*, *Flook*, *Chakrabarty*, and *Diehr*, the majority held that the Federal Circuit's machine-or-transformation test was an "important and useful clue" regarding patent eligibility, but it was not the "exclusive test."[430] Ultimately, the Court resolved *Bilski* "narrowly on the basis of this Court's decisions in *Benson*, *Flook*, and *Diehr*, which show that [Bilski's] claims are not patentable processes because they are attempts to patent abstract ideas."[431] *Bilski*'s impact was limited, however, because no majority emerged to outright prohibit business method patents, as Justice Stevens advocated,[432] or to adopt a clear alternative to the machine-or-transformation test.[433]

In 2002, the Court unanimously held in *Mayo Collaborative Services v. Prometheus Laboratories* that a patent claiming a method for the use of

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Sherkow, *supra* note 2; Taylor, *supra* note 61; Rachel E. Sachs, Note, *Diagnostic Method Patents and Harms to Follow-On Innovation*, 126 HARV. L. REV. 1370 (2013).

    425.   *See Bilski*, 561 U.S. 593, 599 (2010) (quoting Claim 1).

    426.   *Id.* at 599–600.

    427.   *In re* Bilski, 545 F.3d 943, 954–55 (Fed. Cir. 2008) (en banc).

    428.   *Id.* at 950–58.

    429.   *Bilski*, 561 U.S. at 613.

    430.   *Id.* at 602–04.

    431.   *Id.* at 609.

    432.   *See id.* at 613–57 (Stevens, J., concurring in the judgment).

    433.   *Id.* at 612–13. However, five Justices rejected *State Street Bank*'s "useful, concrete, and tangible result" test for patent eligibility. *See id.* at 644–48 (Stevens, J., concurring in the judgment); *id.* at 659–60 (Breyer & Scalia, JJ., concurring in the judgment); *see also* Dennis Crouch, Bilski v. Kappos *and the Anti-*State Street *Majority*, PATENTLY-O (June 28, 2010), https://patentlyo.com/patent/2010/06/bilski-v-kappos-and-the-anti-state-street-majority.html [https://perma.cc/X4YE-5RAL] ("Although not rejected by the majority opinion, it is clear that the broad 'useful, concrete, and tangible result' test is dead.").

thiopurine drugs in the treatment of autoimmune diseases was not patentable subject matter.[434] The claimed process involved administering a drug, subsequently determining the level of metabolized drug in a patient's body, and then indicating whether the amount of the drug given needed to be increased or decreased in subsequent administrations.[435] The district court held the patent invalid because it effectively claimed a natural law or physical phenomena—"the correlations between thiopurine metabolism levels and the toxicity and efficacy of thiopurine drug dosages"[436]—but the Federal Circuit reversed, holding that the claimed steps satisfied the machine-or-transformation test because it involved transformation of the human body or blood taken from the body.[437] The Supreme Court reversed, agreeing with the district court that the claimed process was nothing more than an attempt to claim a law of nature.[438] The addition of "well understood, routine, conventional activity" as part of the claims, such as administering a drug and drawing blood from a patient, were insufficient to "transform unpatentable natural correlations into patentable applications."[439] Part II of the Court's opinion then discussed *Flook* and *Diehr* at length, ultimately concluding that "[t]he claim before us presents a case for patentability that is weaker than the (patent-eligible) claim in *Diehr* and no stronger than the (unpatentable) claim in *Flook*."[440] The Court also relied on *Benson*, asserting that, as in that case, simply implementing an unpatentable claim using a machine "was not a patentable application of that principle."[441]

The following year, the Court held in *Association for Molecular Pathology v. Myriad Genetics, Inc.* that isolated, naturally occurring DNA is not patentable subject matter, but synthetically-created DNA known as complementary DNA (cDNA) was patent eligible.[442] Myriad owned several patents related to the location and sequence of the BRCA1 and BRCA2 genes, which were highly correlated with a marked increase in breast and ovarian cancer in women.[443] After invalidity challengers

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434. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 72 (2012).

435. *Id.* at 74–75.

436. *Id*. at 76.

437. Prometheus Labs., Inc. v. Mayo Collaborative Servs., 581 F.3d 1336, 1345–47 (Fed. Cir. 2009).

438. *Id.* at 77–80.

439. *Id.* at 80.

440. *Id.* at 80–82.

441. *Id.* at 84–85.

442. Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 580 (2013).

443. *Id.* at 582–83; *see also* U.S. Patent No. 5,747,282 (issued May 5, 1998) (BRCA1); U.S. Patent No. 5,837,492 (issued Nov. 17, 1998) (BRCA2); U.S. Patent No. 5,693,473 (issued Dec. 2, 1997) (BCRA1); U.S. Patent No. 5,709,999 (issued Jan. 20, 1998) (BCRA1); U.S. Patent No.

prevailed at the district court, the Federal Circuit reversed, relying heavily on *Chakrabarty* to conclude that Myriad's claimed DNA sequences were patent eligible because they had been isolated from a larger DNA segment through human intervention and therefore were patentable.[444] After a remand from the Court in light of *Mayo*,[445] the Federal Circuit again held both isolated natural DNA and cDNA were patent eligible.[446] The Supreme Court unanimously reversed on the former issue, holding that naturally occurring DNA sequences, even if isolated, were a product of nature and thus not patentable.[447] The Court noted that "*Chakrabarty* is central to this inquiry," and reasoned that this case was distinguishable because, unlike Dr. Chakrabarty's genetically-modified bacteria, "Myriad did not create anything. To be sure, it found a useful and important gene, but separating that gene from its surrounding genetic material is not an act of invention."[448]

Finally, in 2014, the Court held in *Alice Corp. v. CLS Bank International* that patent claims for a computer-implemented method for mitigating settlement risk by using a third-party intermediary were not patent eligible.[449] The district court held that the relevant claims were ineligible "because they are directed to the abstract idea of 'employing of a neutral intermediary to facilitate simultaneous exchange of obligations in order to minimize risk.'"[450] A highly fractured Federal Circuit, sitting en banc, affirmed in a one-paragraph *per curiam* opinion, with seven separate opinions spanning 135 pages.[451] The Supreme Court unanimously affirmed, holding that the claims "are drawn to the abstract idea of intermediated settlement, and that merely requiring generic computer implementation fails to transform that abstract idea into a patent-eligible invention."[452] In an opinion written by Justice Thomas, the Court articulated a two-step framework for evaluating whether an invention is ineligible for patenting. The first step is assessing "whether the claims at issue are directed to one of th[e] patent-ineligible concepts"—"laws of nature, natural phenomena, and abstract ideas."[453] If

5,710,001 (issued Jan. 20, 1998) (BCRA1); U.S. Patent No. 5,753,441 (issued May 19, 1998) (BCRA1); U.S. Patent No. 6,033,857 (issued Mar. 7, 2000) (BCRA2).

444. Ass'n for Molecular Pathology v. USPTO, 653 F.3d 1329, 1350–55 (Fed. Cir. 2011).

445. Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 568 U.S. 1045, 1045 (2012).

446. Ass'n for Molecular Pathology v. USPTO, 689 F.3d 1303, 1309 (Fed. Cir. 2012).

447. *Myriad*, 569 U.S. at 579.

448. *Id.* at 590–91.

449. Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 212 (2014).

450. *Id.* at 214 (quoting CLS Bank Int'l v. Alice Corp., 768 F. Supp. 2d 221, 252 (D.D.C. 2011)).

451. CLS Bank Int'l v. Alice Corp., 717 F.3d 1269 (Fed. Cir. 2013).

452. *Alice*, 573 U.S. at 212.

453. *Id.* at 217.

so, the second step is to "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application"—that is, whether there is "an 'inventive concept'" that "amounts to significantly more than a patent upon the [ineligible concept] itself."[454] Applying this test, the Court held that under the first step, the claimed method was drawn to "the abstract idea of intermediated settlement."[455] It cited *Benson* and *Flook*, as well as *Bilski*, in support of this conclusion.[456] For step two, the Court held that "[t]he introduction of a computer into the claims" was insufficient to render it eligible.[457] The Court again relied on both *Benson* and *Flook*, as well as *Diehr*, in support.[458]

C.   Lower Court Citations

Another measure of the continuing impact of the Burger Court's patent eligibility decisions are lower federal court citations to these cases. To examine this, we used the "Citing References" feature in WestlawNext to identify court decisions that cited *Benson*, *Flook*, *Chakrabarty* and *Diehr*.[459] We limited the results to federal circuit and district court cases between 1980 and 2019. Figure 1 below depicts a graphic representation of the number of citations to each of these cases, grouped into five-year intervals.

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454.   *Id.* at 217–18 (quoting Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 72 (2012)).

455.   *Id.* at 218.

456.   *Id.* at 218–20.

457.   *Id.* at 222.

458.   *Id.* at 222–25.

459.   *Bradley* was omitted from the search results, as only six federal court cases have cited it since 1980, according to WestlawNext.
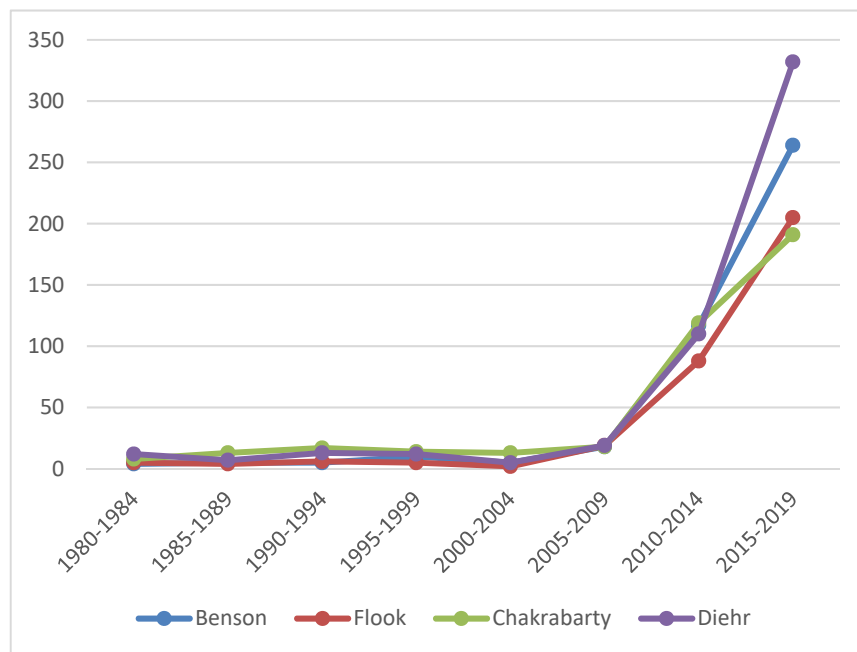
Figure 1. Citations to Burger Court Patent Eligibility Decisions

As can be seen, *Benson*, *Flook*, *Chakrabarty*, and *Diehr* were cited only infrequently between 1980 and 2009, with no more than 20 citations for any half-decade for these cases. But as the Supreme Court returned to the issue of patent eligibility starting with *Bilski*, these cases took on renewed importance. From 2010 to 2014, *Benson* was cited 117 times, *Flook* was cited 88 times, *Chakrabarty* was cited 119 times, and *Diehr* was cited 110 times. From 2015 through 2019, court citations to these cases again markedly increased, as *Benson* was cited 264 times, *Flook* was cited 205 times, *Chakrabarty* was cited 191 times, and *Diehr* was cited 332 times. Thus, even as attention has focused on the impact of recent cases like *Mayo* and *Alice*, the Burger Court patent eligibility decisions continue to have significance.

V. IMPLICATIONS

In this final section, we offer some implications based upon this Article's deep dive into the history of patentable subject matter jurisprudence.

First, the internal deliberations of the Court in *Diehr* (and its companion case, *Bradley*) help shed light on the ongoing debate about

whether *Flook* and *Diehr* can be reconciled.[460] The evidence from the Powell Archive suggests they cannot, and that *Diehr* should be viewed as superseding *Flook*.[461] Justice Powell—who provided the critical fifth vote in *Diehr*—ultimately came to view his vote in *Flook* as a mistake.[462] In particular, Justice Powell concluded that language in *Flook* suggesting that novelty and nonobviousness under §§ 102 and 103 were relevant in determining patent eligibility under § 101 was erroneous.[463] This has continuing importance today, as the *Mayo* decision expressly cited *Flook* in declaring that "well understood, routine, conventional activity engaged by scientists who work in the field" was insufficient "to transform an unpatentable law of nature into a patent-eligible application of such a law."[464] This reasoning is directly contradicted by *Diehr*, which held that "[t]he 'novelty' of any elements or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter."[465] Similarly, Justice Powell expressed the view in *Diehr* that "[c]laims embracing [a] process must be viewed as a whole,"[466] refuting language in *Flook* that seemingly parsed the claims into an unpatentable algorithm and a series of well-known, prior art steps, then declared the entire patent invalid.[467]

The Burger Court also warned about the ramifications of a broad reading of the judicially-created exceptions to patent eligibility, noting that such an approach, "if carried to its extreme, [would] make all inventions unpatentable because all inventions can be reduced to

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460.   *See* Chao, *supra* note 424, at 430 ("[T]he Court's failure [in *Mayo*] to acknowledge that *Flook* and *Diehr* are simply irreconcilable."); Kevin Emerson Collins, *Propertizing Thought*, 60 SMU L. REV. 317, 349 (2007) ("*Flook* and *Diehr* are difficult to reconcile."); Golden, *supra* note 2, at 1781 (noting "the clear tensions . . . between the differing language and holdings of *Diehr* and its predecessor *Flook*"). *But see* Diamond v. Diehr, 450 U.S. 175, 192 n.14 (1981) ("Our reasoning in *Flook* is in no way inconsistent with our reasoning here.").

461.   *Cf.* Athena Diagnostics, Inc. v. Mayo Collaborative Servs., 927 F.3d 1333, 1346 (Fed. Cir. 2019) (Chen, J., concurring with denial of petition for en banc rehearing) ("Given *Diehr*'s evident disagreement with *Flook*'s analysis, *Diehr*, as the later opinion, was widely understood to be the guiding, settled precedent on § 101 for over three decades.").

462.   *See* authorities cited *supra* notes 317–19 and accompanying text.

463.   *See* authorities cited *supra* notes 317–19 and accompanying text; *see also supra* text accompanying note 378 (expressing the view in *Bradley* that patent eligibility and novelty/nonobviousness are separate issues).

464.   Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 79 (2012) (citing Parker v. Flook, 437 U.S. 584, 590 (1978)).

465.   Diamond v. Diehr, 450 U.S. 175, 188–89 (1981); *see also* Taylor, *supra* note 61, at 181 (also noting the apparent conflict between *Diehr* and *Mayo*).

466.   First Draft, Opinion for the Court, Diamond v. Diehr (No. 79-1112), *supra* note 324, at 1 (handwritten note of Justice Powell).

467.   *Flook*, 437 U.S. at 594.

underlying principles of nature which, once known, make their implementation obvious."[468] The Roberts Court expressed a similar view in *Mayo*, declaring that "too broad an interpretation of" judicially-created exceptions to patent eligibility "could eviscerate patent law" because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."[469] Despite these concerns, § 101 has been applied to strike down hundreds of issued patent claims in court,[470] and to reject many more at the USPTO, particularly for computer software and medical diagnostics.[471] Patent eligibility issues have even reached into formerly "safe" areas like mechanical engineering. In a recent decision, a divided Federal Circuit panel struck down a method of manufacturing propeller shafts because the claimed method applied Hooke's law to help dampen vibrations,[472] despite a sharp dissent by Judge Moore that "[t]he majority's decision expands § 101 well beyond its statutory gate-keeping function."[473]

In addition, the archival material recounted in this paper illustrates the Burger Court's struggle to understand complex and highly technical matters like computer software and biotechnology and to reconcile these emerging technologies with a patent law framework originally designed for other industries. A reoccurring sentiment from the clerks and Justices involved in these cases was that Congress should act to provide patent applicants and the USPTO with clearer guidance about the scope of patent eligibility for these new technologies. But as Congress had failed to do so, it fell to the Court to address these issues. As a result, several of the Justices cast their votes tentatively in the decision-making process (sometimes subsequently switching sides) and tried to limit the impact of their holdings. The Court's difficulty in grasping the complexities of cutting-edge technologies that are often at issue in patent eligibility

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468.   *Diehr*, 450 U.S. at 189 n.12.

469.   Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 71 (2012).

470.   *See* Sachs, *supra* note 11 ("In the past five years [2014–2019], 781 unique patent claims have been held invalid in whole or in part by federal courts.").

471.   *See* Colleen Chien & Jiun Ying Wu, *Decoding Patentable Subject Matter*, 2018 PATENTLY-O PAT. L.J. 1, 17 (2018) (analyzing bulk data on USPTO decisions from 2008–2017 and finding that "the data confirm that [§] 101 is playing an increasingly important role in the examination of software and medical diagnostic patents").

472.   Am. Axle & Mfg., Inc. v. Neapco Holdings LLC, 939 F.3d 1355, 1359–68 (Fed. Cir. 2019). "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 (vibrates)." *Id.* at 1362.

473.   *Id.* at 1368 (Moore, J., dissenting); *see also id.* at 1375 ("Section 101 simply should not be this sweeping and this manipulable. It should not be used to invalidate claims under standards identical to those clearly articulated in other statutory sections, but not argued by the parties.").

disputes is echoed by Justice Scalia's concurrence in *Myriad*, which candidly raises a similar concern.[474]

Ultimately, the failure of two different Courts—the Burger Court and now the Roberts Court—to articulate clear boundaries and rules regarding the scope of patent eligibility suggests legislative action by Congress is desirable. Members of Congress, intellectual property scholars, and private organizations have offered a variety of different proposals to amend § 101 to bring greater clarity and certainty to this issue.[475]

One option is to eliminate the judicially-created exceptions to patent eligibility entirely, and instead rely on the statutory categories listed in § 101—process, machine, manufacture, or composition of matter—and a rigorous enforcement of the remaining requirements for patentability, including novelty, nonobviousness, and adequate disclosure of the invention.[476] The principal benefit of this approach would be eliminating the ongoing confusion and uncertainty created by the *Mayo*/*Alice* two-step test, which has been widely criticized as unclear, unpredictable, and unworkable.[477] However, this would be a drastic change, as it would effectively overturn over 150 years of deeply-rooted tradition regarding the common-law role of courts in determining the scope of patent eligibility. In addition, it may undermine the view that basic knowledge and fundamental scientific principles should be "part of the storehouse of knowledge . . . free to all . . . and reserved exclusively to none."[478]

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474.   *See* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 596 (2013) (Scalia, J., concurring in part and concurring in the judgment) (declining to join parts of the Court's opinion "going into fine details of molecular biology" because he was "unable to affirm those details on my knowledge or even my own belief").

475.   *See* USPTO, PATENT ELIGIBLE SUBJECT MATTER: REPORT ON VIEWS AND RECOMMENDATIONS FROM THE PUBLIC (July 2017); *Sens. Tillis and Coons and Reps. Collins, Johnson, and Stivers Release Section 101 Patent Reform Framework*, THOM TILLIS (Apr. 17, 2019), https://www.tillis.senate.gov/2019/4/sens-tillis-and-coons-and-reps-collins-johnson-and-stivers-release-section-101-patent-reform-framework [https://perma.cc/CQD4-VLC9]; Taylor, *supra* note 18; *see also* authorities cited *supra* note 17. For a helpful summary of these proposals, see Lefstin, *supra* note 18, at 563–66.

476.   *See* Lefstin, *supra* note 18, at 565 ("Another proposal is to eliminate the doctrine of patent eligibility as a separate patentability requirement in favor of the other existing statutory patentability requirements . . . ."); Risch, *supra* note 413, at 606–07 ("Attention to rigorous application of the patentability standards would replace unclear and undefined subject matter rules based on unsupportable statutory interpretations of the Patent Act."); Taylor, *supra* note 18, at 2209 ("[T]o correct the problems with the modern patent eligibility requirement, Congress might eliminate any eligibility requirement in § 101 in favor of the patentability and specification requirements included in the remainder of the patent statute.").

477.   *See, e.g.*, USPTO, *supra* note 475, at 29–31; Mossoff, *supra* note 18, at 2; Osenga, *supra* note 18, at 1195–97; Taylor, *supra* note 18, at 2154–57; Taylor*, supra* note 61, at 158–62.

478.   Bilski v. Kappos, 561 U.S. 593, 602 (2010) (quoting Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948)).

A second option is replace the existing judicially-created exceptions to patent eligibility with a list of specific exclusions defined by statute.[479] This alternative, which David Taylor has called the "laundry list" approach,[480] could be based on the framework adopted by the European Patent Convention, which sets forth a list of ineligible patent subject matter:

(a) discoveries, scientific theories and mathematical methods;
(b) aesthetic creations;
(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers; [and]
(d) presentations of information.[481]

The EPC further clarifies that these exceptions "shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a . . . patent application . . . relates to such subject-matter or activities as such."[482] As a result, "claims directed only to scientific theories are ineligible," while "practical applications of scientific theories would be eligible."[483] The USPTO has also recently adopted regulations that move a bit closer toward this approach by delineating certain grouping of patent subject matter as presumptively ineligible, including "mathematical concepts"; "certain methods of organizing human activity" such as "fundamental economic principles or practices" and "managing personal behavior or relationships or interactions between people"; and "mental process . . . performed in the human mind."[484] The main benefit of this approach is that it will (hopefully) bring greater clarity and certainty regarding the scope of patent eligibility. The potential downsides are that it lacks flexibility because all exceptions must be enacted—and in the future, amended—by Congress,[485] and that it may render ineligible some categories of subject matter that are currently patentable.[486]

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479.   Lefstin, *supra* note 18, at 564; Taylor, *supra* note 18, at 2198–2201.

480.   Taylor, *supra* note 18, at 2198.

481.   Convention on the Grant of European Patents (European Patent Convention) art. 52(2), 1065 U.N.T.S. 271–72 (Oct. 5, 1973).

482.   *Id.* art. 52(3).

483.   Taylor, *supra* note 18, at 2199.

484.   2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 52 (Jan. 7, 2019).

485.   *See* Taylor, *supra* note 18, at 2201 ("Where the laundry list approach does not fare well, however, is the principle of flexibility.").

486.   *See id.* at 2199–2200 (noting that methods for doing business and computer programs are categorically ineligible under the European approach but potentially eligible under U.S. law).

A third possibility is for Congress to adopt a new, more workable standard for patent eligibility, and then leave its implementation to the courts. For example, some scholars have proposed codifying the "anything under the sun made by man" language in the 1952 Patent Act's legislative history, which would "eliminate from eligibility anything that is not the result of human effort."[487] Alternatively, Congress could modify the existing *Mayo*/*Alice* test to make eligible any "practical application" of an abstract idea, law of nature, or physical phenomenon, assuming the claim falls within one of the statutory categories.[488] The main potential drawback of such an approach is that if the new standard is not well defined, it may simply shift the battle over patent eligibility from the *Mayo/Alice* framework to the new, statutory language.[489]

Based upon our in-depth study of the history of patent eligibility, we think that some combination of the second and third approaches is most likely to bring greater clarity and certainty to the thorny question of patent eligibility. A list of clearly defined categorical exceptions to patentable subject matter, such as purely mental activities, algorithms standing alone, and fundamental scientific principles as such, would protect the basic building blocks of knowledge from exclusivity.[490] Perhaps more controversially, Congress could also eliminate the possibility of patent protection for products existing solely in nature, such as naturally-occurring DNA (thus codifying *Mayo*), as well as methods of doing business (thus adopting the position of the four dissenting Justices in *Bilski*). In addition, Congress should consider articulating and adopting a more workable test regarding patent eligibility for all other inventions, such as those described in the previous paragraph. Finally, Congress should codify some of the key reasoning in *Diehr*, including that considerations of novelty and nonobviousness under § 102 and § 103 are irrelevant to patent eligibility, and that each claim must be evaluated as a

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487. *Id.* at 2202.

488. Lefstin, *supra* note 18, at 564; *see also* Letter from Donna P. Suchy, Section Chair, Am. Bar Ass'n, Section of Intellectual Prop. Law, to the Hon. Michelle K. Lee, Under Sec'y of Commerce for Intellectual Prop. & Dir. of the U.S. Patent & Trademark Office (Mar. 28, 2017), https://patentdocs.typepad.com/ files/letter-5.pdf [https://perma.cc/HTT8-35CW] (proposing a similar approach).

489. *See The State of Patent Eligibility in America: Part I: Hearing Before the Subcomm. on Intellectual Prop.*, *S. Comm. on the Judiciary*, 116th Cong. (June 4, 2019) (statement of Professor Joshua D. Sarnoff, Professor of Law, DePaul University College of Law, at 21–22) (contending that new statutory language regarding patent eligibility "is unlikely to generate greater certainty than current eligibility doctrine when adjudicators subsequently interpret and apply the new legislative language").

490. *See* TILLIS, *supra* note 475 (proposing similar exceptions).

whole to determine whether it is eligible.[491] While not perfect, such an approach would help reduce the confusion and lack of clarity endemic to the current *Mayo/Alice* framework.

VI. CONCLUSION

The archival materials examined in this Article regarding the Burger Court's patent eligibility jurisprudence offer several important insights regarding the scope of patentable subject matter. In particular, they reveal that Justice Powell, whose vote was critical in *Diehr*, ultimately came to view his decision against patent eligibility in *Flook* to be a mistake, suggesting that the Court implicitly superseded that decision. In addition, they candidly reveal the Court's struggles with understanding the intricacies of emerging, cutting-edge technology and then applying, and in some cases modifying, the law to address them. Finally, the failure of two different Courts, with almost thirty years in between, to clearly delineate the scope of patent eligibility suggest that Congress may be best suited to finally resolving this issue and providing greater clarity and certainty to inventors, the USPTO, and the courts.

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491.   *See id.* (proposing to amend the Patent Act to "[m]ake clear that eligibility is determined by considering each and every element of the claim as a whole and without regard to considerations properly addressed by 102, 103 and 112").