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Don't Cite Funk

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Cover Page Footnote

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DON'T CITE FUNK

Oskar Liivak⁺

For patent eligibility the Supreme Court continues to rely on its 1947 opinion in *Funk Brothers Seed v. Kalo Inoculant*. It is one of the most cited cases for patent eligibility and the Supreme Court relies heavily upon it. It forms one of the foundations of the current eligibility test in *Mayo v. Prometheus*. This article argues that this reliance is in error. Funk is just not appropriate for modern patent eligibility. Interestingly this view is not new. Ever since its appearance in *Flook*, the Supreme Court's use of Funk has been dogged by criticism that faults the Court for improperly using an obviousness case for subject matter eligibility purposes. The Court has noted these criticisms but has flatly dismissed them. The critiques persist but they have remained a minority view in the patent academy. This article argues that the critics have had it right all along but that they have not gone far enough. Funk is indeed an obviousness case but that alone has not been sufficient. The missing link is an argument about statutory interpretation. What has not been fully appreciated is that the 1952 Patent Act changed the meaning of the patent eligibility statute. Curiously, this is true even though the literal text of the provision did not change. But once that change is understood, it becomes clear that not only is Funk an obviousness case but more importantly it cannot be a patentable subject matter case. When properly understood, the answer is clear. The Court should no longer cite Funk for patent eligibility

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Patent eligibility remains one of the most contentious subjects in patent law. It truly involves difficult issues but unnecessary confusion has also been hindering clear thinking. One such blunder is the Supreme Court's continued reliance on its 1947 opinion in *Funk Brothers Seed v. Kalo Inoculant*. It is one of the most cited cases for patent eligibility and the Supreme Court relies heavily upon it. Starting with *Parker v. Flook* in 1978 and through to today, *Funk* lies at the heart of modern patent eligibility. It forms one of the foundations of the current eligibility test in *Mayo v. Prometheus*.

This article argues that this reliance is in error. *Funk* is just not appropriate for modern patent eligibility. Interestingly this view is not new. Ever since its appearance in *Flook*, the Supreme Court's use of *Funk* has been dogged by criticism that faults the Court for improperly using an obviousness case for subject matter eligibility purposes. The Court has noted these criticisms but has flatly dismissed them. The critiques persist but they have remained a minority view in the patent academy.

This article argues that the critics have had it right all along but that they have not gone far enough. *Funk* is indeed an obviousness case but that alone has not been sufficient. The missing link is an argument about statutory interpretation. What has not been fully appreciated is that the 1952 Patent Act changed the meaning of the patent eligibility statute. Curiously, this is true even though the literal text of the provision *did not* change. But once that change is understood, it becomes clear that not only is *Funk* an obviousness case but more importantly it cannot be a patentable subject matter case. When properly understood, the answer is clear. The Court should no longer cite *Funk* for patent eligibility.

I. INTRODUCTION

Of the five requirements for patentability, 35 U.S.C. § 101's patent eligibility requirement is the initial gatekeeper.¹ It determines what types of technological creations can be the subject of a patent. Recently, the Supreme Court has taken a serious and prolonged interest in this critically important provision. In the first fourteen years of the 21st century the Court has heard as many § 101 cases as it heard in the last fifty years of the preceding century.² This focus culminated in the test developed in *Mayo*.³ Unfortunately, despite all that effort, the law of patent eligibility is not settled. There is serious discontent with the Court's work. The *Mayo* test continues to be the center of significant criticism.⁴ The situation is bad enough that Congress is considering stepping in and just resetting all of the common law development.⁵

1. See *Bilski v. Kappos*, 561 U.S. 593, 594, 601 (2010) (noting that § 101 marks the "threshold" of the patent system and "defines the subject matter that may be patented").

2. Starting in 1948 the Court heard five § 101 cases: *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948), *Gottschalk v. Benson*, 409 U.S. 63 (1972), *Parker v. Flook*, 437 U.S. 584 (1978), *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), *Diamond v. Diehr*, 450 U.S. 175 (1981). From 2000 to 2013 the Court heard another five § 101 cases: *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124 (2001), *Bilski v. Kappos*, 561 U.S. 593 (2010), *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66 (2012), *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013), and *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014).

3. See *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66, 72–73 (2012).

4. See Brief of United States Senator Thom Tillis, et al., as Amici Curiae In Support of Petition by American Axle & Manufacturing, Inc. for a Writ of Certiorari Directed to the U.S. Court of Appeals for the Federal Circuit, *Am. Axle v. Neapco Holdings LLC*, 939 F.3d 1355 (Fed. Cir. 2019) (No. 20-891), 2021 WL 979563, at *5 (describing the current state of the law for § 101 as an "unintelligible hash").

5. See Courtenay C. Brinckerhoff, *Congress Releases Draft Patent Eligibility Legislation*, NAT'L L. REV. (May 28, 2019), <https://www.natlawreview.com/article/congress-releases-draft-patent-eligibility-legislation>; see also Press Release, Office of Senator Thom Tillis, Sens. Tillis and Coons and Reps. Collins, Johnson, and Stivers Release Draft Bill Text to Reform Section 101 of the Patent Act (May 22, 2019) (on file with author) ("Additional Legislative Provisions. . . . No implicit or other judicially created exceptions to subject matter eligibility, including 'abstract ideas,' 'laws of nature,' or 'natural phenomena,' shall be used to determine patent eligibility under section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated.").

The bulk of the debate over patentable subject matter centers on the judicially created prohibitions that exclude “laws of nature, physical phenomena, and abstract ideas” from patent protection.⁶ Though “not required by the statutory text,” these exclusions have “defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years.”⁷ The Court’s patentable subject matter discourse therefore has focused almost exclusively on understanding these prohibitions by analogizing and differentiating its own cases.⁸ Within this pantheon of cases, the 1948 case of *Funk Brothers Seed Co. v. Kalo Inoculant Co.* is one of the most influential.⁹ And recently *Funk*’s importance has been growing rapidly.¹⁰ Most notably, *Funk* is at the heart of the controversial “inventive concept” test that emerged in *Mayo*.¹¹

But there is a real problem with this central role being played by *Funk*. It is an error. Today the Court draws heavily on *Funk* to interpret § 101 but it should not. The case is just not good precedent for interpreting modern § 101 and it is distorting our view of that provision. Interestingly, criticism of *Funk* is not new. At least since *Funk* appeared prominently in the Court’s 1978 decision in *Parker v. Flook*, commentators have argued quite vociferously that *Funk* is really an obviousness case.¹² They have argued that the Supreme Court has “badly . . . confuse[d] the statutory-categories requirement of § 101.”¹³ As suggested by its title, this article largely agrees with these critiques yet they remain the minority view. And it may seem that this debate is long settled. After all, in 1978 the Supreme Court heard these very same critiques in *Parker v. Flook* and without any elaboration it swept them aside as being based on “fundamental misconceptions.”¹⁴

Yet more than forty years has passed since that exchange but the controversy over *Funk* and § 101 has still not settled. This article argues that there is something deeper going on and there is a missing, unexamined piece to this long-standing puzzle. The two sides appear to be entering the debate with unstated

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

7. *Bilski v. Kappos*, 561 U.S. 593, 601–02 (2010).

8. See *Mayo Collaborative Servs.*, 566 U.S. at 72 (“Our conclusion rests upon an examination of the particular claims before us in light of the Court’s precedents.”).

9. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 127 (1948). *Funk* has been cited by the Supreme Court 11 times. Only *Diamond v. Chakrabarty* has been cited more times with 15 citations. *Diamond v. Diehr* has been cited by the Court 7 times. *Parker v. Flook* has been cited 9 times. *Gottschalk v. Benson* has been cited 11 times.

10. *Funk* is increasingly being cited by Federal courts. Starting with the decade of 1950–1960 and ending with 2010–2020, the number of Federal court citations to *Funk* per decade are 18, 9, 13, 8, 6, 22, 124 respectively.

11. See Jeffrey A. Lefstin, *An Inventive Application: A History*, 67 FLA. L. REV. 565, 567, 624 (2015) (“[A]nd [the] 1960s carried forward the Funk Brothers doctrine to Flook, which in turn became the foundation of Mayo.”).

12. See *infra* note 151 and accompanying text.

13. *In re Bergy*, 596 F.2d 952, 962 (C.C.P.A. 1979).

14. *Parker v. Flook*, 437 U.S. 584, 592 (1978).

yet incompatible base assumptions about the basic structure of the patent system. For *Funk* critics it has been enough to simply argue that *Funk* is an obviousness case. They appear to be operating under the assumption that if *Funk* is an obviousness case then it cannot be relevant for § 101. They implicitly understand patentability as separate, distinct statutory silos for patent eligibility and for obviousness. For them, once identified as a case about obviousness, this is enough to conclude that *Funk* cannot be used for eligibility.

Meanwhile the Court (at least in *Flook* and *Mayo*) appears to see things differently. For it, § 101 lays out a general omnibus requirement for patentability while subsequent provisions like § 102 and § 103 further elaborate on the general requirement set out in § 101. With such a view, the Court may well readily accept that there is close kinship between *Funk* and obviousness but, in its view, this does not imply that *Funk* cannot be used for patent eligibility. For the Court, overlap between § 101 and § 103 is built into the system. And to see it otherwise would indeed appear to the Court as evidencing “fundamental misconceptions.”

This debate has remained unresolved because the two sides appear to be operating with fundamentally different understandings of the basic structure of the patent system. And just as importantly, the Court and its critics have never properly aired the difference. This article aims to unearth that unstated divide.

This article argues that their difference can be both understood and ultimately resolved when it is seen as a debate over statutory construction.¹⁵ In particular, the fight over *Funk* is actually a fight over the impact of the 1952 Patent Act and its creation of the obviousness requirement. Prior to the 1952 Patent Act, the term “invention” incorporated much of what we today separate out into distinct requirements of patentability. In that earlier era, the conclusion that something rose to the standard of an “invention” largely meant that the thing could merit a

15. The two scholars, Prof. Jeffrey Lefstin and Prof. Joshua Sarnoff, have also been exploring statutory interpretation and the “invention.” Prof. Jeffrey Lefstin hints that the “invention” may well be the source of the conflict. See Lefstin, *supra* note 11 at 645 (“[T]oday’s Court continues to reach back to an older paradigm of patent law, one with a different conception of ‘the invention’ and perhaps one with more fluidity between the various doctrines of patentability . . .”). This article takes Lefstin’s suggestion and shows that indeed the understanding of the invention is a central aspect of the § 101 debate, and it shows that the Court’s understanding cannot be squared with the text of the modern patent act. In his work and especially in his advocacy work, Prof. Joshua Sarnoff has been even more explicit about interpreting the “invention” and argues that the meaning of the “invention” did *not* change with the passage of the 1952 Patent Act. As a result, in his view, *Funk* and therefore *Flook*’s “inventive application” requirement are still part of modern § 101. See Brief of Nine Law Professors as Amici Curiae Supporting Petitioners, *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66 (2012) (No. 10-1150) (Joshua Sarnoff as Counsel of Record for Amici Curiae), 2011 WL 4071921; Joshua D. Sarnoff, *Patent-Eligible Inventions After Bilski: History and Theory*, 63 HASTINGS L.J. 53 (2011). Though this article disagrees with Prof. Sarnoff’s ultimate conclusion, his work remains notable as it is one of the few that focuses attention on statutory interpretation and the “invention.”

patent.¹⁶ Not only did it mean that the thing was a complete solution to some technical problem, but it also denoted the cleverness and creativeness of that solution. The main statutory provision of that era required that a successful patentee must “invent” in order to receive a patent.¹⁷ This one term was understood to incorporate two distinct requirements. An invention denoted both that the patentee had actually solved a technical problem (the inventor had invented an invention) and that the solution was creative enough (the invention that the inventor invented was inventive). This latter aspect of invention came to be called the “requirement of invention.” It was hard to define and harder to adjudicate. In the late 1940s, this unwieldy test caught the eye of Congress and one of the central aims of the 1952 Patent Act was to rectify the muddied requirement of invention.¹⁸ Congress did so by introducing an obviousness requirement into patent law.¹⁹ This requirement resides today in 35 U.S.C. § 103.²⁰ But the precise impact of § 103 on the overall structure of patent law has not been fully examined or decided. The structural relationship between § 101 and § 103 has not been clarified. This article argues that the fight over *Funk* and the modern fight over an “inventive application” in modern § 101 can be understood in part as confusion over statutory construction.

On one side, the Court’s embrace of *Funk* and its “inventive application,” has without much discussion implicitly taken the view that the meaning of “invents” in § 101 did not change with the 1952 Patent Act. Pre-1952 cases like *Funk* interpreted language that looks nearly identical to the present day § 101. Both require that the patentee “invents or discovers.” Initially it certainly seems reasonable for the Court to rely on a case like *Funk* to understand modern § 101. After all, the relevant statutory language literally did not change. In contrast, the *Funk* critics have implicitly taken an opposing view. For them, even though the language of the statute did not change, they nonetheless understand the 1952 Patent Act as changing the meaning of “invents or discovers.” That change in meaning results in *Funk* being wholly inappropriate for modern § 101.

A purpose of this article is to air this interpretive divide. So far neither side has fully articulated their interpretive commitments and that lack of clarity has fueled misunderstanding. For example, there still exists confusion and uncertainty related to the relationship between *Parker v. Flook* and *Diamond v. Diehr*. The two cases seem to be in significant tension and it has never been

16. Giles S. Rich, *Laying the Ghost of the “Invention” Requirement*, 14 FED. CIR. B.J. 163, 167 (2004) (“What it all came down to, in final analysis, in the Patent Office or in court, was that if the Office or a judge was persuaded that an invention was *patentable* (after hearing all the praise by the owners and all the denigration by the opposition) then it was an ‘invention.’”).

17. 35 U.S.C. § 31, R.S. § 4886.

18. See *Graham v. John Deere*, 383 U.S. 1, 14 (1966) (“Congress has emphasized ‘nonobviousness’ as the operative test of . . . [§ 103], rather than the less definite ‘invention’ language of Hotchkiss that Congress thought had led to ‘a large variety’ of expressions in decisions and writings.”).

19. See *id.*

20. See 35 U.S.C. § 103.

clear if *Diehr* overruled critical parts of *Flook*. To some this could just be a result of differing policy commitments. This article argues that *Flook/Diehr* question can be understood instead as confusion over the proper interpretation for the “invents” language in § 101. *Flook* adopts the older, pre-1952 interpretation while *Diehr* seems to adopt the newer, post-1952 interpretation.

This is an important question as it implicates the basic structure of the patent system. For all involved, it is clear that the 1952 Patent Act aimed to clarify the then existing “requirement of invention.” But exactly how the Act did this remains (some seventy years later) opaque. Certainly obviousness was added in § 103. But what remains of the “invents or discovers” language in § 101. Did its meaning stay that same or did the creation of obviousness necessarily change the meaning of that language?

In the Court’s pro-*Funk* view, the 1952 Act aimed to clarify the requirement of invention but it did not intend to change the understanding of the “invention” or “invents.”²¹ Rather the purpose of the new Act was to give *a new test for invention*. For the Court, the requirement of invention was central to patent law but had become muddled and confusing.²² The obviousness requirement of § 103 was added as a test that would help determine the presence or absence of invention. Invention still combined all the general standards of patentability but now patent law was given a test to help determine if the “requirement of invention” was or was not present in a particular case. In other words, in this view, if a patent claim failed the obviousness requirement of § 103, then this would confirm that lack of invention and the claim would be invalid. Section 103 can be seen as one way of establishing a lack of invention. Importantly, this view also structures how we talk about and describe patent law. In this view, it is redundant to use the term nonobvious invention while it is incoherent or at least confusing to talk about an obvious invention.

This understanding leads to its own particular structure of the patent system. In it, § 101 is an omnibus general statutory statement on patentability just as had been the case for its predecessor, 35 U.S.C. § 31. The added sections of § 102 and § 103 are just further statutory elaborations on what is meant for something to be “new” and to be an “invention” respectively. And accordingly, if a court can conclude (perhaps by turning to precedent) that a patent is claiming something that does not rise to an “invention” even without explicitly considering obviousness then that court could still invalidate the patent claim based on § 101. This interpretation has a direct impact on § 101 and *Funk*. As § 101 still requires that a patentee “invents” and as the invention still means what it meant prior to 1952, and because *Funk* spends significant time discussing what it means to “invent” then *Funk* is still seen as perfectly good precedent for

21. *Graham*, 383 U.S. at 17.

22. *Id.* at 15 (quoting H.R. Rep. No. 1923 at 7, 82d Cong., 2d Sess. (1952) (“That provision paraphrases language which has often been used in decisions of the courts, and the section is added to the statute for uniformity and definiteness. This section should have a stabilizing effect and minimize great departures which have appeared in some cases.”)).

understanding modern § 101. And accordingly, there is then nothing amiss with inquiring about the cleverness of the technical solution for § 101 because the term “invents” still allows that inquiry in § 101 even when a separate provision (i.e. § 103) provides *a* particular test for invention.

The critics of *Funk* have implicitly interpreted the 1952 Act quite differently. For them, obviousness was meant to fully replace the old requirement of invention that had preceded it. The “requirement of invention” was to be surgically removed from “invention” and moved to its new home in § 103 and was to be renamed as obviousness. The “invents” language in § 101 remained behind yet because of the surgery, that critically important terminology changed its meaning. Prior to 1952, “invention” did a lot of work in patent law encompassing both the thing created as well as the cleverness of that thing. The critics of *Funk* have implicitly adopted an interpretation where the 1952 Act moved these two duties into separate statutory provisions and in doing so “invention” changed its meaning. Invention no longer concerned cleverness or obviousness. It now only referred to the complete technical solution conceived and disclosed by the patent applicant. This understanding has important implications for the modern use of *Funk* for § 101 purposes.

Even though the critical “invents or discovers” text remained unchanged in modern § 101, its meaning nonetheless changed.²³ And as *Funk* focused on whether the patentee had met the requirement of invention, it just cannot be appropriate for modern § 101’s requirement that the patentee “invents.” At best *Funk* could *only* be relevant for understanding whether an invention is obvious. This view provides a different way to talk about and describe patent law. In this view, an obvious invention would be a perfectly coherent description of subject matter that satisfied § 101 but failed § 103. Similarly, a nonobvious invention is a perfectly sensible (non-redundant) description of subject matter that satisfied both § 101 and § 103.

This article will further detail these two interpretations and show that some (but not all) of the Court’s § 101 patent opinions in the past seventy years have implicitly adopted the former view while other opinions of the Court and the Court of Appeals for the Federal Circuit have adopted the latter view. The analysis presented here is impeded in part by the fact that these court opinions have adopted these positions without clearly acknowledging or discussing this divide. By opening up this interpretative issue, this article hopes to bring the ambiguity to the forefront so it can be finally decided.

Ultimately the article weighs the arguments on either side of the interpretative divide and finds that the pro-*Funk* interpretation cannot stand. Its older, outdated understanding of the “invention” just did not survive the 1952 Act. The 1952 Patent Act redefined the “invention.” The Act simplified the meaning of the invention such that *Funk* is, at best, relevant only for interpreting § 103’s obviousness requirement, not for modern § 101. As a result, the “inventive

23. Compare the modern 35 U.S.C. § 101 with 35 U.S.C. § 31, R.S. § 4886.

application” test from *Mayo* loses its precedential support. The courts should stop citing to *Funk* and the Supreme Court needs to reassess the continued vitality of its test from *Mayo*.

Though the bulk of this article argues that the Court has made an error, it concludes on a softer tone toward the Court. The Court should not shoulder all the blame for this error. In a number of cases, the Court has made clear that it will not allow a rule that can be subverted simply by clever drafting by patent attorneys.²⁴ The Court seems to be deeply concerned that patentable subject matter should depend on what in fact the patentee did or did not create rather than it becoming a matter of the patent “draftsman’s art.”²⁵ Thus far, the critics of *Funk* have yet to offer a compelling, non-*Funk* vision for § 101 that safeguards § 101 from becoming “a dead letter.”²⁶

In this regard no better example can be found than Judge Giles Rich. While clearly and vehemently disagreeing with the Court’s continued use of *Funk*, Judge Rich offered an alternative vision that certainly did not assuage the Court’s worries that § 101 had to maintain real substantive punch. Rather, his views, though clearly removing *Funk* from § 101, also made compliance with § 101 trivial and the Court just could not abide so permissive and toothless a vision for patentable subject matter.²⁷

There is a better way. The article concludes by highlighting a viable, alternative understanding of § 101 that already exists and one that, rather ironically, exists in *Funk* itself. A long string of cases draws an important distinction between the specific *means* conceived by an inventor with the useful *ends* that the inventor hoped to achieve.²⁸ In these cases, the invention is the specific means not the ends. And curiously there is a well-known case that applies this distinction though unfortunately it does so not in the majority opinion. In *Funk* itself Justice Frankfurter penned a prescient concurrence that provides a very useful and insightful exposition of this issue, and it provides a good starting point for understanding the “invention” for modern § 101. It provides a vision free from the errors present in today’s embrace of *Funk* but it also provides a substantive vision for § 101 that is far from toothless.

II. THE CONVENTIONAL VIEW OF FUNK AND ITS LEGACY

Before getting to its criticisms, this section introduces the conventional understanding of *Funk*, the patent at issue as well as the legal reasoning in the majority opinion. The section then describes the continued importance of the case for today’s patentable subject matter jurisprudence.

24. *Parker v. Flook*, 437 U.S. 584, 590, 593 (1978); *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 77 (2012).

25. *Mayo Collaborative Servs.*, 566 U.S. at 72 (quoting *Flook*, 437 U.S. at 593).

26. *Id.* at 89.

27. See *infra* note 286-293 and accompanying text.

28. See *infra* note 294.

A. *Funk*, as Understood by the Majority

In 1948, the Supreme Court heard *Funk Brothers Seed Co. v. Kalo Inoculant Co.*²⁹ The case revolved around root inoculant technology. Plants need nitrogen and if it is depleted in the soil, farmers must supply it for their crops. Most often farmers would supply nitrogen directly by using fertilizers spread directly onto their fields. Of course, this is an added expense for farmers. Yet there is an alternative, plentiful source of free nitrogen. The Earth's atmosphere is 78% nitrogen and some plants, most notably legumes like alfalfa, beans, clover, peanuts, soybeans, have developed a clever way to access this atmospheric nitrogen. These plants have evolved to have a symbiotic relationship with specific *Rhizobium* and *Bradyrhizobium* bacteria that enables atmospheric nitrogen to be fixed and made available to the plants. The plants form special root nodules specifically to host the bacteria. The bacteria fix atmospheric nitrogen making it available to the plants. This allows these plants to grow and thrive in otherwise nitrogen depleted and unfertilized soils.

When farmers want to take advantage of this free nitrogen, they needed to ensure that the roots of their legumes were properly colonized by these beneficial bacteria. For that, agronomists developed inoculants containing these special bacteria. Well before the patent at issue in *Funk* was filed, it was known that not all species of the genus *Rhizobium* would infect all the plants of genus *Leguminosae*.³⁰ The existing commercial inoculants contained a single strain of bacteria designed for a single, specific crop.³¹ If a farmer had multiple crops, then multiple unique inoculants would have to be employed.³²

A mixed, universal inoculant would certainly have been useful for farmers but such a composite inoculant that contained each of the specific bacteria needed for each of the legumes was not thought possible.³³ As relayed by the Court in *Funk*, attempts to provide such an inoculant "had proved generally

29. 333 U.S. 127 (1948).

30. U.S. Patent No. 2,200,532, p. 1, col. 1, ll. 31–33 (filed Aug. 24, 1938).

31. '532 Patent. p. 2, col. 2, ll. 4–7. "The so-called Bible of the inoculant art, 'Root Nodule Bacteria and Leguminous Plants,' by Fred, Baldwin and McCoy, University of Wisconsin Studies in Science, Number 5, 1932, reported that composite cultures 'offer advantages and many disadvantages' and that 'it is desirable to have only the one type of organism in the culture.'" *Kalo Inoculant Co. v. Funk Bros. Seed Co.*, 161 F.2d 981, 985 (7th Cir. 1947), *rev'd*, 333 U.S. 127 (1948).

32. '532 Patent. p. 2, col. 2, ll. 8–14 ("The use of a single species of bacteria in a culture presents a serious difficulty in the manufacture and distribution of bacterial inoculants, since it is therefore necessary to distribute a separate culture contained in a separate package for the inoculation of seeds of plants belonging to the various cross-inoculation groups.").

33. '532 Patent. p. 2, col. 1, ll. 70–col. 2, ll. 7 ("It has heretofore been considered impracticable to prepare a composite culture inoculant containing organisms which will cause nodulation on more than one of the cross-inoculation groups. This has not been done because it was generally believed that one species produced an inhibitory effect on another species within the same culture, whereby symbiotic nitrogen fixation by the plant and the organism was inhibited or even prevented. For this reason it has been considered desirable to use a culture containing a single species of organism rather than one containing a mixture.").

unsatisfactory because the different species of the Rhizobia bacteria produced an inhibitory effect on each other when mixed in a common base, with the result that their efficiency was reduced.”³⁴

In June of 1937, Varley Bond, a researcher at the Kalo Inoculant Company, discussed the desirability of a composite inoculant with Kalo’s president.³⁵ In the face of the failure of others and indeed contrary to the collective wisdom of the field, Bond set out to see if an effective composite inoculant could be found. Through his efforts Bond overthrew that conventional wisdom by “discover[ing] that there are strains of each species of root-nodule bacteria which do not exert a mutually inhibitive effect on each other.”³⁶ Bond applied for a U.S. Patent on August 24, 1938, relating to this discovery and the patent issued on May 14, 1940.

When Kalo sued the Funk Brothers Seed Company for their use of a mixed inoculant, the District Court invalidated Kalo’s patent claims “for want of invention” while yet also finding that “if they were valid, [the] defendant infringed.”³⁷ The Court of Appeals reversed on invalidity. It held that Bond’s patent did not represent “so-called ‘aggregation,’” but rather that, “[i]t is inventive conception.”³⁸

This set the stage for the now famous Supreme Court patent case of *Funk Bros. Seed Co. v. Kalo Inoculant Co.* The Court took the case to consider the issue of validity.³⁹ After reviewing the background to Bond’s work, the Court summarized that Bond “provided a mixed culture of Rhizobia capable of inoculating the seeds of plants belonging to several cross-inoculation groups.”⁴⁰ The Court emphasized that its sole focus was on the validity of the “product claims” to the mixed culture.⁴¹

Having laid out its understanding of the scientific background and of the patent, the Court began its legal analysis. To start, the Court emphasized that a scientific discovery itself could not be the subject of a patent. And in this case, that meant that the discovery alone where some mixtures of bacteria do not inhibit each could not be patented. With eloquent and oft quoted language the Court noted that 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.”⁴² With that fundamental limitation noted, the Court went

34. *Funk Bros. Seed Co.*, 333 U.S. at 129–30 .

35. *Funk Bros. Seed Co.*, 161 F.2d at 984.

36. *Funk Bros. Seed Co.*, 333 U.S. at 130.

37. *Funk Bros. Seed Co.*, 161 F.2d. at 982.

38. *Id.* at 988.

39. *Funk*, 333 U.S. at 128.

40. *Id.* at 130.

41. *Id.*

42. *Id.*

on to state that “[i]f 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.”⁴³

Notably the Court of Appeals found that Bond did more than just discover the fact that there exists some mixtures that do not inhibit each other. In its view, Bond had gone further and “made a new and different composition of non-inhibitive strains which contributed utility and economy to the manufacture and distribution of commercial inoculants.”⁴⁴ This, according to the Court of Appeals, was enough to secure patentability.⁴⁵

The Court agreed with the appellate court that Bond’s “aggregation of select strains of the several species into one product is an application of that newly-discovered natural principle.”⁴⁶ But the Court felt that this was not enough to sustain the patent. Bond’s “aggregation of species fell short of invention within the meaning of the patent”⁴⁷ Citing to the 1941 case of *Cuno Engineering Corp. v. Automatic Devices Corp.*, the Court emphasized that the individual strains that constituted Bond’s mixture were not new.⁴⁸

Each of the species of root-nodule bacteria contained in the package infects the same group of leguminous plants which it always infected. No species acquires a different use. The combination of species produces no new bacteria, no change in the six species of bacteria, and no enlargement of the range of their utility. Each species has the same effect it always had. The bacteria perform in their natural way. Their use in combination does not improve in any way their natural functioning. They serve the ends nature originally provided and act quite independently of any effort of the patentee.⁴⁹

By bringing those pre-existing, unchanged bacteria together in the mixture, the Court found that Bond had provided “hardly more than an advance in the packaging of the inoculants.”⁵⁰ The Court held that “the product claims do not disclose an invention or discovery within the meaning of the patent statutes” and therefore the patent claim was invalid.⁵¹

B. *Funk’s Legacy*

Though more than seventy years old, *Funk* continues to be one of the most important patentable subject matter cases from the Court. Of the modern patentable subject matter cases only *Diamond v. Chakrabarty* has been cited

43. *Id.*

44. *Id.* at 130–31.

45. *Id.*

46. *Id.* at 131.

47. *Id.*

48. *Id.* at 131–32.

49. *Id.*

50. *Id.*

51. *Id.* at 132.

more times by the Court. And rather than fading into the hoary past, *Funk* is actually gaining prominence. Starting in 1950, the number of Federal court citations to *Funk* per decade were 18, 9, 13, 8, 6, 22, 124 respectively.⁵² An even more dramatic rise is seen in the overall literature. Citations to *Funk* per decade since 1950 were 46, 31, 85, 175, 288, 678, and 1140 respectively.⁵³ *Funk* is a foundational part of modern patentable subject matter whose importance is only growing. It is playing a central role at the heart of the *Mayo* test.

In *Mayo*, the Court collected its precedents and tried to synthesize them into a workable test. The Court held that its precedents “insist that a process that focuses upon the use of a natural law also contain other elements or a combination of elements, sometimes referred to as an ‘inventive concept,’ sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself.”⁵⁴ For this proposition, the Court cited to its 1978 opinion in *Parker v. Flook*. Admittedly, *Flook* itself does not directly cite to *Funk* when it holds that “the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.”⁵⁵ But the connection is clear.⁵⁶

In particular the connection is most evident from the Solicitor General’s briefing in *Parker v. Flook*. The brief cited *Funk* and explained that the *Funk* Court invalidated the patent because it “‘fell short of invention within the meaning of the patent statutes.’ The reason, as the Court explained, was that there was nothing inventive in preparing the mixture of bacteria to carry out the discovery, once the scientific discovery (unpatentable in itself) was grasped”⁵⁷ Of further note, the Solicitor General’s brief in *Flook* adds to its discussion of an inventive concept by again citing to *Funk* and arguing that it requires something “*beyond the routine, conventional, or uninventive applications* that follow once the applicant possesses the idea.”⁵⁸ That particular passage is strikingly similar to *Mayo*’s requirement that a patentee engage in more than “well-understood, routine, conventional activity.”⁵⁹

Via the Solicitor General’s briefing for *Flook*, the inventive application requirement born in *Funk* was brought into the post-1952 case law via *Flook* and has now reemerged as the center piece of the test in *Mayo*.

52. Searches conducted using Google Scholar.

53. *Id.*

54. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. at 72–73 (2012).

55. *Parker v. Flook*, 437 U.S. 584, 594 (1978)

56. See Lefstin, *supra* note 11 at 623–24 (detailing the connection between *Funk*’s requirement of an inventive application to *Flook*, and from there to today’s *Mayo* test).

57. Brief for Petitioner at 8, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 978 WL 206636, at *19–20.

58. *Id.* (emphasis added).

59. *Mayo Collaborative Servs.*, 566 U.S. 66, 73 (2012).

III. FUNK AS A § 103 CASE: A PERSISTENT YET UNSUCCESSFUL CRITICISM

There is no doubt that *Funk* is a foundational case for modern patentable subject matter. It provides the precedential support for the general test announced in *Mayo*. But *Funk* should not play such an out-sized role in today's § 101 jurisprudence. This article argues that there is a fundamental problem with *Funk*. To begin, and echoing earlier works, *Funk* is at best an obviousness case not a patentable subject matter one.⁶⁰ And even as an obviousness case, *Funk* is highly questionable as it relied upon the one case that was explicitly overruled by the 1952 Patent Act. Furthermore, *Funk* is inconsistent with the Court's post-1952 cases like *United States v. Adams*.⁶¹

Interestingly, the criticism that *Funk* is really an obviousness case is not new. Though it has recently resurfaced after *Mayo* resurrected *Funk*, the arguments have been around for some time. In fact, the criticism was presented directly to the Court in 1978 when the Court heard *Parker v. Flook*. The Court in *Flook* noted the argument but then swept it aside without any real discussion.

This section will first lay out the argument that *Funk* is really an obviousness case and it will conclude by revisiting *Flook* to highlight where this argument was already heard and ultimately dismissed by the Court.

A. At Best, *Funk* is Relevant for § 103

When students learn about patentable subject matter and the landmark cases from the past seventy years, *Funk Brothers Seed Co. v. Kalo Inoculant Co.* figures prominently.⁶² At first nothing seems out of place. It seems indeed to be a patentable subject matter case focusing on products of nature and the case is simply following fairly standard statutory interpretation. In *Funk* the majority

60. Earlier works have argued that *Funk* should be understood as an obviousness case; but this article expands on and combines that argument and extends it to establish that *Funk* is not appropriate for interpreting § 101. See Shine Tu, *Funk Brothers – An Exercise in Obviousness*, 80 UMKC L. REV. 637, 637 (2012) (“[T]his article argues that *Funk Brothers* is erroneously relied upon by judges and juries alike to determine the limits of patentable subject matter, and that in reality, *Funk Brothers* is a case that outlines the obviousness standard.”); 1 DONALD S. CHISUM, CHISUM ON PATENTS § 1.02(7)(b) (2022) (“The *Funk Bros. Seed* decision is perhaps best viewed as an interpretation of the non-obviousness or ‘invention’ requirement.”); Janice M. Mueller, *Facilitating Patient Access to Patent-Protected Genetic Testing*, 6 J. BUS. & TECH. L. 83, 87 (2010) (arguing that *Funk* is a non-obviousness case based on the requirement of invention); Herbert H. Jervis, *Seduced by the Sequence: An Analysis of Association of Molecular Pathology v. Myriad Genetics*, 16 FL. COASTAL L. REV. 65, 104 (2014) (“With the benefit of sixty plus years of hindsight, the holding in *Funk Bros.* can be best understood if one considers it not to be a decision grounded in § 101 but one grounded in the pre-1952 ‘want of invention’ standard.”); Matthew W. Siegal and Etan Chatlynne, *In Myriad, Did Supreme Court Confuse Its Own Precedent?*, LAW360 (Aug. 5, 2013), <https://www.law360.com/articles/459177> (“Although the Supreme Court treats *Funk Brothers* as a patent-eligibility case, arguably, *Funk Brothers*, like other ‘lack of invention’ cases, may be more accurately classified as an obviousness case.”).

61. See generally *United States v. Adams*, 383 U.S. 39 (1966).

62. 1 PETER MENNEL ET AL., *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 279 (2020).

cites only one statutory provision. Importantly, it does *not* cite today's § 101. That is not surprising; § 101 did exist until 1952. Instead, *Funk* cites 35 U.S.C. § 31, R.S. § 4886. But reassuringly, a quick turn to the history books finds that that provision had language that is quite familiar to anyone acquainted with modern § 101.⁶³ Section 31 reads:

SECTION 31. INVENTIONS PATENTABLE. *Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvements thereof, or who has invented or discovered and asexually reproduced any distinct and new variety of plant, other than a tuber-propagated plant, not known or used by others in this country, before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceeding had, obtain a patent therefor.*⁶⁴

The initial (italicized) portion is nearly identical to today's § 101. A quick look at the case and even a quick check with the history books seems to confirm that indeed *Funk* was, and can still be, used as a patentable subject matter case.

But that first impression is not correct. At the time *Funk* was written § 31 covered a significant amount of patent law.⁶⁵ And furthermore, and critically important for this article, even the rather short phrase “invented or discovered” from § 31 (that is still found in today's “invents or discovers” in § 101) covered quite a lot of ground. Looking to a leading treatise of the time, WALKER ON PATENTS, reveals that there were two quite distinct sections dealing with the words “invented or discovered” from § 31.⁶⁶ The statutory language is dealt with in Chapter 2 entitled “The Subject Matter of Patents” and in Chapter 3 entitled “Invention.”⁶⁷

It is worthwhile to give an overview of these two chapters while working through the legal analysis in *Funk*. As will be clear, the *Funk* opinion works

63. Today's patentable subject matter provision in 35 U.S.C. reads: “Section 101. Inventions patentable. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101 (2018).

64. 35 U.S.C. § 31, R.S. § 4886.

65. Even aside from the words “invented or discovered,” a lot of patent law was being packed into § 31. It certainly included the language of today's § 101, but it also clearly explicitly included utility and novelty as well. In fact, other than the disclosure requirements, all of the major requirements for patentability were packed into § 31.

66. 1 ANTHONY WILLIAM DELLER, WALKER ON PATENTS § 16 at 58, § 23 at 109 (Deller's ed. 1937).

67. To understand Walker's organization, note that chapters include “Novelty” and “Utility” among others.

through an analysis that spans both chapters. Chapter 2, “The Subject Matter of Patents,” begins by detailing the specific classes of things that are patentable subject matter including arts, machines, manufactures, compositions of matter or improvements thereof.⁶⁸ The chapter goes on to define the limits of patentable subject matter listing prohibitions on patents covering naked laws of nature and scientific principles,⁶⁹ and abstract ideas.⁷⁰ These classes of permitted and prohibited subject matter are still the same ones attached to today’s § 101.⁷¹

Furthermore, sections of this chapter on patentable subject matter discuss famous cases including *The Telephone Cases*,⁷² *LeRoy v. Tatham*,⁷³ and *DeForest Radio v. General Electric*.⁷⁴ That whole chapter still resonates today and would be quite familiar as a discussion of today’s § 101. And indeed, *Funk* begins its analysis in similar fashion. *Funk* dutifully cites to *Le Roy v. Tatham*, *The Telephone Cases*, and *DeForest Radio*.⁷⁵ Eloquently summing up those cases, the Court noted their central thrust:

[P]atents cannot issue for the discovery of the phenomena of nature. 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. . . . 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.⁷⁶

After laying out this foundational rule of patentable subject matter, the Court goes on to consider whether Bond, the patentee in the case, had satisfied this requirement. And in what may be surprising to many only casually acquainted with *Funk*, the Court acknowledges that Bond’s work overcomes it. The *Funk* Court credits Bond with the idea that “[d]iscovery of the fact that certain strains of each species of these bacteria can be mixed without harmful effect to the properties of either is a discovery of their qualities of non-inhibition.”⁷⁷ Of course such a discovery alone without more cannot qualify for a patent—that is the point of cases like *Le Roy*. As noted above, the patent applicant must “apply” her discovery.⁷⁸ Importantly, the Court concedes that Bond has met this standard; he did apply his discovery. The Court acknowledges that Bond’s

68. DELLER, *supra* note 64, §§ 11–14, 17, at 38, 51, 52, 55, 60, 62.

69. *Id.* §§ 18–19 at 62.

70. *Id.* § 21 at 68.

71. *See Chakrabarty*, 447 U.S. at 307.

72. DELLER, *supra* note 64, § 19, at 65 (discussing *The Telephone Cases*, 126 U.S. 1 (1888) and its relation to patentable subject matter).

73. *Id.* at 64 (discussing *LeRoy v. Tatham*, 55 U.S. 156 (1852) and its relation to patentable subject matter).

74. *Id.* (discussing *DeForest Radio Co. v. General Electric Co.*, 283 U.S. 664 (1931) and its relation to patentable subject matter).

75. *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

76. *Id.*

77. *Id.* at 130–31.

78. *See supra* note 73.

mixture “is an application of that newly-discovered natural principle.”⁷⁹ In short, the *Funk* Court agrees with the appellate court that Bond’s work is patentable subject matter insofar as those foundational cases are concerned. In the Court’s eyes Bond had applied his discovery.

But this of course is not the end of the Court’s analysis in *Funk*. The Court did ultimately find that Bond’s patent was invalid, and it did so by looking to an additional requirement that went beyond those outlined above. The second chapter in WALKER ON PATENTS which deals with “invented or discovered” material is entitled “Invention.”⁸⁰ To the modern student of patent law this chapter heading may at first appear unfamiliar but on closer examination its contents soon become recognizable. As seen below, without a doubt that chapter describes what we today call “obviousness.”

As related in WALKER, this requirement of “invention” is something that goes beyond utility and novelty.⁸¹ It requires determining the “prior art,” and focuses on distinguishing between results that required “mere skill” in contrast to creations that required “invention.”⁸² And in trying to delineate that boundary, the treatise pays particular attention to the Supreme Court’s 1851 decision in *Hotchkiss v. Greenwood*.⁸³ The case famously required patentees to go beyond strict novelty to be able to obtain a patent.⁸⁴ In *Hotchkiss* the Court noted that “unless more ingenuity and skill in applying [an] old method . . . were required . . . than [that] possessed by an ordinary mechanic[,] . . . there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention.”⁸⁵ And though this chapter is titled “Invention,” modern students will unmistakably recognize this requirement as today’s obviousness requirement from § 103. Further cementing this conclusion, WALKER notes that this determination can be aided by “strong circumstance[s] to establish the quality of invention”⁸⁶ including objective criteria like “long-felt want,”⁸⁷ “failure of others,”⁸⁸ and “commercial success.”⁸⁹ For anyone familiar with modern

79. *Id.*; see also Norman Siebrasse, *The Rule Against Abstract Claims: A Critical Perspective on U.S. Jurisprudence*, 27 CAN. INTELL. PROP. REV. 3, 10 (2011) (“The Court acknowledged that the patent was for an ‘application of this newly-discovered natural principle.’”).

80. DELLER, *supra* note 64, § 23, at 109–110. Just as patentable subject matter had, this requirement of invention was seen as flowing from the words “invented” and “discovered” from Section 4886.

81. *Id.* § 24, at 112.

82. *Id.* § 27, at 138.

83. *Id.* § 28, at 150.

84. See *Graham v. John Deere*, 383 U.S. 1, 4 (1966).

85. *Id.* at 11.

86. DELLER, *supra* note 64, § 25, at 123.

87. *Id.* § 25, at 119.

88. *Id.* § 25, at 123.

89. *Id.* § 44, at 236.

obviousness from 35 U.S.C. § 103 the resemblance is undeniable.⁹⁰ This chapter is describing not some facet of patentable subject matter, but rather it is describing the pre-1952 case law that formed the requirement of “invention” that went on to be codified in § 103 and is now known as the requirement of non-obviousness.

Before returning to the analysis in *Funk*, it is important to notice that near the end of the chapter on “Invention,” Walker includes a subsection titled “Aggregation” that deals with what we would today call the obviousness of combination patents.⁹¹ That section makes clear that combinations of prior art elements can often fail the overall requirement of “invention,” and indeed, obviousness still works that way today.⁹² Some combinations of prior art elements may well be obvious, while some combinations are not.⁹³ In WALKER, such prior art combinations that failed to satisfy the invention requirement were called “mere aggregation[s].”⁹⁴ An aggregation was a term of art which simply denoted a combination that had not risen to the level of the requirement of invention. Today we would call an aggregation simply an obvious combination. Though no longer used today, this focus on the requirement of “invention” and the even more archaic term “aggregation” is necessary since that archaic terminology figures prominently in the second half of the majority opinion in *Funk*.

As previously noted, the *Funk* Court found Bond’s work to be “an application of that newly-discovered natural principle”⁹⁵ and therefore it met the patentable subject matter requirement as laid out by the Court and by WALKER’s chapter on “Patentable Subject Matter.” Yet the *Funk* opinion makes clear that this is not enough. The Court found that Bond’s work was a mere “aggregation of species [that] fell short of invention with the meaning of the patent statutes.”⁹⁶ In other words, *Funk* clarified that the Court faulted Bond not with failing patentable subject matter but instead with failing the “requirement of invention.”

If there was any doubt remaining, note that *Funk* cites to only one case for its ultimate conclusion that “the product claims do not disclose an invention or discovery within the meaning of the patent statutes.”⁹⁷ The majority opinion cites to Justice Douglas’s 1938 opinion in *Cuno Engineering Corp. v. Automatic*

90. See *Graham*, 383 U.S. at 17–18 (describing secondary considerations that “may” be relevant for § 103 obviousness determinations).

91. DELLER, *supra* note 66, § 42, at 218.

92. See *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415–17 (2007).

93. *Id.*

94. The court in *Keystone Driller v. Nw. Eng’g Corp.*, 294 U.S. 42, 50 (1935) held that where parts of a combination are “all old in the art and that the combination of them and adaptation of the combined results were a mere aggregation of old elements requiring no more than mechanical skill, [they] were not, therefore patentable invention.” DELLER, *supra* note 66, § 42, at 219–20.

95. *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 131 (1948).

96. *Id.* at 130–31

97. *Id.* at 132.

*Devices Corp.*⁹⁸ *Cuno* is certainly not a patentable subject matter case. It was a mechanical creation involving an automatic cigarette lighter that combined prior art components. It is most definitely a requirement of invention/obviousness case and it is a far cry from any of cases typically associated with patentable subject matter.

The *Cuno* Court, though still focused on 35 U.S.C. § 31; R.S. § 4861, invalidated a patent for an automatic cigarette lighter for failing to meet the requirement of “invention.”⁹⁹ The automatic lighter in the case was made from existing components each of which were already in the prior art separately. But those components had never before been brought together for an automatic cigarette lighter for a car. The Court held that “however useful” the combination, to be patentable that combination “must reveal the flash of creative genius, not merely the skill of the calling” and it could not allow “any relaxation of the rule of the *Hotchkiss* case.”¹⁰⁰ The Court invalidated the patent for failing this requirement of “invention.” This was the sole case that the Court cited to invalidate Bond’s patent in *Funk*.

Importantly though, note that these requirement of “invention” cases like *Cuno* and *Funk* did not of course cite to § 103 and its codified obviousness requirement. Again, they could not as the requirement was not codified into the statute until 1952. Instead, the Court-developed “requirement of invention” was described as an additional requirement that the courts of that era rooted in the era’s statutory requirement of “invented or discovered.”

There is an easy explanation for WALKER’S decision to have two distinct chapters, one for “Patentable Subject Matter” and one for “Invention” even though courts applying either requirement cited to the same “invented or discovered” statutory language. There were two distinct chapters because there were two distinct requirements that had distinct histories and purposes. One was patentable subject matter along with its prohibitions. The other was the “requirement of invention” that, after 1952, become known as the obviousness requirement. Comparing the analysis in *Funk* with the discussion in WALKER, it is clear that the Court’s analysis covers both chapters.

And in so far as traditional patentable subject matter was concerned, Bond’s work cleared that hurdle. It was (as the Court concluded) an application of his discovery. And it was only when the Court went on to consider the second sense of “invents or discovers” that the patentee ran into trouble. In short, the Bond patent in *Funk* was held to be invalid not because it was not patentable subject matter, but because the Court, following *Cuno*, held that Bond’s combination

98. *Id.*; *Cuno Eng’g Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 84 (1941).

99. *Cuno Eng’g Corp.*, 314 U.S. at 85, 88.

100. *Id.* at 91–92. *Hotchkiss* is widely seen as the origin of the obviousness requirement. *Id.* at 91.

failed the requirement of “invention.” To use the parlance of our times, *Funk* was decided on the grounds of obviousness *not* patentable subject matter.¹⁰¹

B. Even as a § 103 case was Funk overruled?

Even if viewed as a § 103 case, *Funk* is highly suspect. Again, the analysis revolves around the 1952 Act. As discussed above, Congress reorganized the patent statute moving the requirement of “invention” from its previous shared home in § 31 and creating a new specific home for it in § 103.¹⁰² Yet this raises another question: When Congress enacted the 1952 Act, did Congress intend to import wholesale all the caselaw that made up the requirement of “invention” into the new standard of obviousness or was Congress also intending to change or modify that standard?

This question percolated for a number of years as courts tried to apply the new statutory language.¹⁰³ Finally, in 1966 the Supreme Court provided some guidance in *Graham v. John Deere Co.*¹⁰⁴ Reviewing the 1952 Act and the standard now housed in § 103, the Court held that:

We believe that this legislative history, as well as other sources, shows that the revision was not intended by Congress to change the general level of patentable invention. We conclude that the section was intended merely as a codification of judicial precedents embracing the *Hotchkiss* condition, with congressional directions that inquiries into the obviousness of the subject matter sought to be patented are a prerequisite to patentability.¹⁰⁵

In other words, *in general* the standard for getting a patent had not changed.

Though the “general” level for patentability was the same, that does not mean that there was not some change on the margins. The Court did go on to note that §103 was “added to the statute for uniformity and definiteness. This section should have a stabilizing effect and minimize great departures which have appeared in some cases.”¹⁰⁶ In other words, cases following the general level for obviousness that embraced the “*Hotchkiss* condition” were still good

101. Others have already made this argument in varying ways. *See supra* note 53.

102. *See supra* notes 18-20 and accompanying text.

103. Note, *Standard of Patentability. Judicial Interpretation of Section 103 of the Patent Act*, 63 COLUM. L. REV. 306, 323-24 (1963) (“The language of the act itself makes it difficult to determine congressional intent, and its legislative history, while evincing some intent to liberalize the law, provides ample material to support a contrary construction. The numerous standards of patentability applied by the courts have been classified according to one of two prevalent interpretations of the first sentence of section 103: (1) The statute merely codified the case law existing on the effective date of the act; or (2) The statute sought to relax the standard of patentability and to restore the law to what it was at the time of *Hotchkiss v. Greenwood*.”).

104. *Graham v. John Deere*, 383 U.S. 1, 3, 17 (1966).

105. *Id.*

106. *Id.* at 15 (quoting S. Rep. No. 1979, 82d Cong., 2d Sess. (1952) at 7; H. R. Rep. No. 1923, 82d Cong., 2d Sess. (1952) at 6).

guidance but cases which represented “great departures” from the general level were not.¹⁰⁷ Though the Court did not list all the cases that constituted improper “great departures,” the Court in *Graham* went on to single out one case in particular. The Court noted that “[i]t also seems apparent that Congress intended . . . to abolish the test it believed this Court announced in the controversial phrase ‘flash of creative genius’ used in *Cuno Corp. v. Automatic Devices Corp.*”¹⁰⁸

Yet *Cuno* was the only case that *Funk* relied upon for its holding that Bond’s patent had failed the requirement of “invention” and the Court in *Graham* held that *Cuno* had been overruled by the 1952 Act. As a result, even when correctly understood as a precedent for § 103, *Funk* may not represent good law as it might not have survived the 1952 Act. Note that, as relayed by the Court in *Graham*, Congress intended to avoid the “departures” represented by “cases.”¹⁰⁹ That plural usage suggests that more than *Cuno* alone was on the chopping block. Any significant departure from *Hotchkiss* should be handled cautiously if at all. Notably, *Funk* itself is certainly seen as a significant shift that raised the bar for the requirement of invention.¹¹⁰

Lastly, further evidence that *Funk* is no longer good law even for § 103 comes not from *Graham*, rather it comes from one of *Graham*’s companion cases—*Adams*—decided the same day as *Graham*.¹¹¹ For *Funk*, *Adams* is of particular importance. It pitted the inventor Adams against the United States government. The case focused on the obviousness of a non-rechargeable water activated battery made of magnesium and cuprous chloride electrodes.¹¹² The prior art had disclosed batteries using zinc and silver chloride electrodes.¹¹³ And the prior art had also alluded to magnesium and cuprous chloride as electrodes.¹¹⁴ Taken

107. *Id.*

108. *Id.* (quoting *Cuno Eng’g Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941)).

109. *Id.* at 15.

110. See Norman Siebrasse, *The Rule Against Abstract Claims: A Critical Perspective on U.S. Jurisprudence*, 27 CAN. INTELL. PROP. REV. 3, 9–10 (2011) (arguing that Funk Brothers was the first modern departure from the rule that any practical application was patent eligible); Norman J. O’Malley, *Recent Decisions, Patents—The Discovery and Application of a Principle of Nature Is Not Inventive if the Application Would be Obvious to Anyone Knowing the Principle*, 36 GEO. L.J. 703, 706 (1948) (“The only way the Court could hold, as it did, that the ingenuity shown was not inventive, was to consider that the fictitious mechanic had more knowledge than existed in the prior art. The mechanic had to be aware of the characteristics of the bacteria discovered. Though an advance may seem simple in retrospect, its very simplicity coupled with the fact that the prior art is void of sufficient teaching to light the way has almost universally been considered an inventive step. Previously, it was only the discoverer who was allowed to patent means-made simple and obvious by his discovery.”); Lefstin, *supra* note 11, at 623 (describing *Funk* as a departure from prior law).

111. *United States v. Adams*, 383 U.S. 39, 40 (1966).

112. *Id.* at 41–42, 48.

113. *Id.* at 45.

114. *Id.* at 46.

together, the United States argued that the prior art rendered the Adams battery obvious.¹¹⁵ The Court disagreed. The Court explained:

We conclude the Adams battery was also nonobvious. As we have seen, the operating characteristics of the Adams battery have been shown to have been unexpected and to have far surpassed then-existing wet batteries. Despite the fact that each of the elements of the Adams battery was well known in the prior art, to combine them as did Adams required that a person reasonably skilled in the prior art must ignore that (1) batteries which continued to operate on an open circuit and which heated in normal use were not practical; and (2) water-activated batteries were successful only when combined with electrolytes detrimental to the use of magnesium. These long-accepted factors, when taken together, would, we believe, deter any investigation into such a combination as is used by Adams. This is not to say that one who merely finds new uses for old inventions by shutting his eyes to their prior disadvantages thereby discovers a patentable innovation. We do say, however, that known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness.¹¹⁶

Despite the conventional wisdom that regarded his battery design as folly, Adams continued to push ahead despite the nay-saying prior art.¹¹⁷ He proved them wrong and developed a battery that worked so well that the Army ultimately understood its innovative design and adopted it.¹¹⁸ In the case, the Supreme Court underscored the importance of teaching away in the prior art and it instructed that “disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness.”¹¹⁹

But note what the Court *did not* do in *Adams*. The Court in 1966 did not cite to *Funk* and it did not assume into the prior art the basic scientific discovery made by Adams. The *Adams* Court did not assume that magnesium and cuprous

115. *Id.* at 48.

116. *Id.* at 51–52.

117. *Id.* at 52 (noting that “long-accepted factors, when taken together, would, we believe, deter any investigation into such a combination as is used by Adams”).

118. *Id.* at 44 (“[I]n November 1943, at the height of World War II, the Signal Corps concluded that the battery was feasible. The Government thereafter entered into contracts with various battery companies for its procurement. The battery was found adaptable to many uses. Indeed, by 1956 it was noted that ‘there can be no doubt that the addition of water activated batteries to the family of power sources has brought about developments which would otherwise have been technically or economically impractical.’ Surprisingly, the Government did not notify Adams of its changed views nor of the use to which it was putting his device, despite his repeated requests. In 1955, upon examination of a battery produced for the Government by the Burgess Company, he first learned of the Government’s action. His request for compensation was denied in 1960, resulting in this suit.”).

119. *Id.* at 52.

chloride electrodes could operate as a water activated battery. If the Court had followed *Funk* and had assumed (as instructed by *Funk*) that the core scientific fact at the heart of the work was already in the prior art, the Court would have easily reached the opposite conclusion that the battery was obvious. The Court in *Adams* did not take that route. Instead, it credited Adams with uncovering something that was largely thought impossible, and the Court instructed that the researcher's unlikely discovery aided his clearing of the obviousness barrier rather than being hindered by it.¹²⁰

Adams is quite inconsistent with *Funk*.¹²¹ Bond showed that the impossible was in fact possible. Rather than using that conventional wisdom-breaking insight to help Bond's efforts toward a patent, the Court in *Funk* instead assumed that fact into the prior art. This then lead inexorably to the conclusion that Bond's creation was the result of mere skill and was not patentable.

Comparing the two cases, it becomes clear that *Funk* is incompatible with the Court's own interpretation of § 103 and indeed the overall view of patentability in *Adams*. If the two cases conflict, which should yield? As developed above, *Funk* is already suspect under *Graham* for relying on *Cuno* and for being a case marking a "significant departure" from past requirement of invention cases. And as *Adams* is a companion case of *Graham* that is explicitly "controlled on the merits by . . . *Graham*," clearly *Funk* should yield.¹²² In short, even as an obviousness case, the majority opinion in *Funk* should have little to no relevance to the modern patent act.

C. The Court Hears Then Dismisses the Criticism

The core argument that *Funk* really should be seen as a case about obviousness has been made before. Once *Funk*'s "inventive application" was resurrected and brought to the fore by *Mayo*, patent commentators have been making these

120. *Id.* at 44 ("Dr. George Vinal, an eminent government expert with the National Bureau of Standards, still expressed doubts [about the Adams battery]. He felt that Adams was making 'unusually large claims' for 'high watt hour output per unit weight,' and he found 'far from convincing' the graphical data submitted by the inventor showing the battery's constant voltage and capacity characteristics. He recommended, 'Until the inventor can present more convincing data about the performance of his [battery] cell, I see no reason to consider it further.'").

121. See Brief Amici Curiae for American Patent Law Association and Los Angeles Patent Law Association, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 223449, at *16 ("If as Petitioner would have it, an inventor's idea is, in effect, used as prior art against him, the result is a hindsight approach to the issue of patentability which this Court has many times condemned, most recently in *United States v. Adams*, 383 U.S. 39, 50 (1966), where, in the course of determining that a patent directed to a battery was invalid, this Court ruled that it 'begs the question' to state that the battery components claimed in combination were known to have been used individually as such components in other batteries. Rather, this Court pointed out that the issue was whether 'bringing them together' was patentable. However, given the idea of bringing them together, the implementation of that idea could not be said to be unobvious since it involved nothing more than putting the components together in a conventional manner to construct a battery.").

122. See *Adams*, 383 U.S. at 41.

criticisms of *Funk*.¹²³ Yet these criticisms predate *Mayo* by decades. Similar criticisms were already part of the debate surrounding the 1978 case of *Parker v. Flook*. And the Court has already weighed in on these criticisms and rejected them. This Section rewinds to 1978 and *Flook* to explore how *Funk* entered into § 101 jurisprudence, and how criticisms of *Funk* were dismissed.

1. *Funk & the Solicitor General's Brief in Flook*

To understand how *Funk* found its way into modern § 101, it is best to begin with the *Flook* briefings, and the most important brief in this regard was the Solicitor General's brief. It is the epicenter of *Funk*'s entry into modern § 101.¹²⁴ The brief begins by first noting that § 101 requires that the patentee "invents or discovers" and it notes that nearly identical language reaches back continuously to the Patent Act of 1790.¹²⁵ The brief then argues that this statutory provision prohibits patents on abstract ideas "absent invention in the application of the idea."¹²⁶ The brief supports this argument by pointing to the Supreme "Court's precedents and 35 U.S.C. 101, codifying them."¹²⁷ Importantly the brief then particularly aims to justify citation to pre-1952 cases like *Funk*. The brief elaborates:

As this Court implicitly recognized in *Benson* . . . by its reliance on early cases, enactment of the 1952 Patent Code did not change the prior law. See *Aro Manufacturing Co. v. Convertible Top Co.*, 365 U.S. 336, 347 n. 2 (Black, J., concurring) (noting that, immediately before the vote in the Senate, the Chairman of the Judiciary Committee stated, in response to the question whether "the bill change[s] the law in any way or only codif[ies] the present patent laws," that the bill "codifies the present patent laws"). As noted . . . , Congress has not altered the statutory language requiring "invention or discovery" in the section enumerating the classes of patentable subject matter since the inception of the patent system. Nor did the addition of 35 U.S.C. 103, defining and codifying the standard for "non-obvious subject matter," change the existing body of law denying patentability for abstract ideas. Section 103 was enacted to codify the law regarding the degree of advance over prior art that would justify a monopoly grant, not to deal with the patentability of ideas or abstractions or of processes incorporating them.

123. See *supra* note 60.

124. Brief for Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636 at *11, *11 n.9; see Lefstin, *supra* note 11, at 641-42 (noting that "inventive application" was at core of the petitioner's brief).

125. Brief for Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636, at *11, *11 n.9.

126. *Id.* at *13.

127. *Id.*

In any event, since the Board concluded that respondent's claims did not contain patentable subject matter as defined in Section 101, it did not reach the question whether the process was barred from patentability by Section 103. Therefore, the question whether the claim embodied a sufficient advance over the prior art to merit a patent was not before the court below and is not before this Court.¹²⁸

Here, the brief set the stage to focus on pre-1952 cases. Having justified turning to "requirement of invention" cases like *Funk* even for modern § 101, the brief then directly cites to *Funk*.¹²⁹ It cites to *Funk* for a rule that a claim not only "embod[ies] a concrete, tangible application of a mathematical or scientific principle; it must also extend beyond *the routine, conventional, or uninventive applications* that follow once the applicant possesses the idea."¹³⁰ As an aside, this passage is eerily similar to today's rule, adopted in *Mayo*, prohibiting patents which involved only "well-understood, routine, conventional activity."¹³¹ The brief then explains that the *Funk* Court invalidated the patent because it "'fell short of invention within the meaning of the patent statutes.' . . . [And] there was nothing inventive in preparing the mixture of bacteria to carry out the discovery, once the scientific discovery (unpatentable in itself) was grasped."¹³²

To allay any doubts about relying on *Funk* itself, the brief further noted that "[i]n *Benson*, the Court held that the principle of *Funk* applies to process claims (like those at issue in both *Benson* and the present case) as well as to claims for "'products' (involved in *Funk*)."¹³³ It is notable that the Solicitor General felt the need to bolster *Funk*'s *bona fides* as if they too recognized that pulling *Funk* into modern § 101 was possibly suspect. Recall that the analysis in *Funk* proceeded in two parts. The first part required "an application of a law of nature," while the second went further and held that the patentee's "aggregation of species fell short of invention."¹³⁴ Critically, *Benson*'s citation to *Funk* did not incorporate the second part of *Funk*'s with its requirement of an inventive application. Rather, *Benson* cited *Funk* only for the first part and its perfectly correct and benign proposition that a patentee had to apply their scientific discovery.¹³⁵ Yet in their brief, the Solicitor General improperly implied that all of *Funk*'s reasoning had already been approved by the Court in *Benson*.¹³⁶

128. *Id.* at 13 n.11.

129. *Id.*

130. *Id.* at 19 (emphasis added).

131. *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 73 (2012).

132. Brief for Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636, at *19-20 (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 131 (1948)).

133. *Id.* at 20.

134. *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130-31 (1948).

135. *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (quoting *Funk*, 333 U.S. at 130) ("As we stated in *Funk* . . . If there is to be invention from . . . a discovery [of a phenomenon of nature], it must come from the application of the law of nature to a new and useful end.").

136. See generally Brief for Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636.

In addition, the brief pointed to other more modern cases that applied *Funk*'s rule that "the application of the law [of nature] must be novel and inventive in character."¹³⁷ The brief cited to three cases *Davison Chemical Corp. v. Joliet Chemicals*, *National Lead Co. v. Western Lead Co.*, and *Armour Pharmaceutical Co. v. Richardson-Merrell, Inc.* The brief stated that "[i]n each of these cases the courts held that no patent should have been granted, because there was no invention in devising the claimed embodiment once the patentee had possession of the idea (which was unpatentable as such)."¹³⁸

Though these three cases will be examined in greater detail below, for now it suffices to note that all three of these cases, like *Funk*, are really obviousness cases. *Davison Chemical* was a pre-1952 case so clearly did not cite to § 103 but *National Lead* and *Armour Pharmaceutical Co.* both explicitly examine § 103 alone. There is nothing in these last two cases tied to a patentable subject matter rejection, yet the brief nonetheless ties them directly into *Flook* and its focus on § 101.¹³⁹

2. Respondent's Brief: Don't Pull Obviousness into § 101

The respondents took aim at these arguments and warned that the Petitioners "[s]eek[] to Borden [sic] Section 101 with a Requirement for 'Invention', Unintended by Congress for That Provision of Title 35"¹⁴⁰ The brief goes on to detail their criticism along lines that sound very familiar to current critiques of *Mayo*. The Respondent argued that the Petitioner

has, improperly, injected considerations of inventiveness into the Section 101 definition of categories of patentable subject matter. The application of Section 101 is not dependent in any way upon non-obviousness. Yet, the Brief for the Petitioner is repetitive throughout with those expressions of language which are only properly applicable to the conditions and requirements of non-obvious subject matter under 35 U. S. C. § 103 (1952).¹⁴¹

137. *Id.* at *21 n.19.

138. *Id.*

139. *See infra* notes 197-223.

140. Respondent's Brief, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 223450, at *7.

141. *Id.* at *1; *see also id.* at n.16 ("The Brief for the Petitioner is improperly burdened with a litany of 'invention' terminology inapplicable to and wholly absent from Section 101: 'Advance over the prior art' (at 9); 'must be implemented in an inventive manner' (at 10); 'only the inventive use . . . warrants patent protection' (at 10); 'predictable in light of the prior art' (at 13); 'a novel and inventive manner' (at 14); 'the non-inventive application of a mathematical result' (at 19); 'must extend beyond the routine, conventional, or uninventive' (at 21); 'new combinations of old elements are patentable only if they are inventive' (at 21, n. 20); 'inventive contribution' (at 22); 'straightforward and conventional implementations' (at 22); and, 'non-inventive computer applications' (at 24). Similarly, the inclusion of the Appendix at the conclusion of the Brief for Petitioner is an irregular excursion made entirely outside the record. The purported prior art there

The thrust was crystal clear. The Solicitor General was improperly burdening § 101 with requirements that were now actually housed in § 103. Importantly for this article, the Respondent's brief explicitly presented the Court with the argument that historic requirement of invention cases like *Funk* have no proper role to play in modern patentable subject matter.

3. Solicitor General's Reply Brief

As these criticisms featured so prominently in respondent's brief, the Solicitor General addressed them straight away in their reply brief. They immediately opened their brief arguing that contrary to the Respondent's claims, they had focused wholly on § 101 and in particular its requirement that the patentee "invents or discovers":

Respondent errs in asserting that our argument confuses the standard of non-obviousness prescribed in 35 U.S.C. 103 and the requirement of statutory subject matter under 35 U.S.C. 101. As respondent recognizes, the patent examiner's sole ground for rejection of the claims at issue was that they did not cover statutory subject matter under 35 U.S.C. 101. We do not contend that respondent's particular algorithm for computing updated alarm-limits is not novel or is obvious within the meaning of 35 U.S.C. 102 or 103. We simply contend that the subject matter he seeks to patent is unpatentable under 35 U.S.C. 101, because it is not an "invention or discovery" within the meaning of that Section.¹⁴²

The Solicitor General makes clear to the Court in *Flook* that they are pushing for a rule where § 101 incorporates the requirement of "invention" standard from *Funk*.¹⁴³ For them the argument was straightforward. They simply pointed to

gratuitously discussed is uncited in the proceedings of record. The entirety of such inappropriate advocacy zeal may be disregarded by the Court.").

142. Reply Brief for the Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 223446, at *1-2.

143. Notably, right at the end of their rebuttal time in oral arguments the Government again put significant emphasis on *Funk* and its "inventive application" requirement:

Now, the *Funk* case, I have to emphasize, was a case in which this Court held that the standard of invention under Section 101 must be applied to the application of the phenomenon of nature. This is not a novel question before this Court. This is the significance of the holding in *Funk*. The claim in *Funk*, was not on the discovery that these bacteria do not inhibit one another; the claim in *Funk* was on the product of a mixed inoculant that was commercially valuable, that was being marketed to farmers for use on their leguminous plants in which these bacteria were intermixed, and that, the Court said, was the application of the phenomenon of nature. It used the very word "application," And then it said, "However ingenious the discovery of the underlying natural principle may have been in this case, the application of it is hardly more than an advance in the packaging of the inoculants." The application didn't meet the standard of invention. And the very last paragraph of the opinion says, "We conclude that the product claims do not disclose an invention or discovery within the meaning of the patent statutes." And at that time Section 103 was not in the patent statute. That was merely common law about

the statutory language in § 101, noting that the language and “overall standard of patentability had not changed” and then just citing to all of *Funk* and its requirement of an “inventive application.”¹⁴⁴

4. *The Supreme Court Requires an “Inventive Application”*

After taking in the briefing the Court ultimately rejected the critiques of *Funk* and the Court sided with the Government adopting its position to include *Funk*'s requirement for “inventive application” in modern § 101. The criticisms from the respondents were noted but dismissed by the Court: “[r]espondent argues that this approach imports into § 101 the considerations of ‘inventiveness’ which are the proper concerns of §§ 102 and 103.”¹⁴⁵ The Court swept those concerns aside finding that they were “based on . . . fundamental misconceptions.”¹⁴⁶

The Court held that independent of § 102 and § 103, patent law required that the patentee “invents or discovers” and therefore the Court’s inquiry was squarely within § 101 and that “[t]he obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is, in fact, new or obvious.”¹⁴⁷ In other words, the Court followed the Government’s lead noting that § 101 should focus on the statutory language. If cases can illuminate that statutory language, then it is the end of the story and those cases were consulted. Ultimately the Court conceptually connected with *Funk* requiring not just an application of a phenomena of nature but rather it had to be “an inventive application of the principle [to] be patented.”¹⁴⁸

Notably, not every Justice agreed with the majority. Justice Stewart’s dissent was joined by Chief Justice Berger and Justice Rehnquist.¹⁴⁹ Their dissent takes up some of the criticisms and warns that “[t]he Court today . . . strikes what seems to me an equally damaging blow at basic principles of patent law by importing into its inquiry under 35 U. S. C. § 101 the criteria of novelty and inventiveness.”¹⁵⁰

5. *“Inventive Application” Flares Up then Goes Dormant*

With *Flook*, the immediate debate ended and the “inventive application” from *Funk* was for the time being a prominent part of § 101. Yet it was soon to flare

obviousness. What was in the patent statute was that it must be an invention or discovery of a new and useful product, and it wasn’t because there was no novelty in the application of the phenomenon. Transcript of Oral Argument at 41–42, *Parker v. Flook*, 437 U.S. 584 (1978) (No.77-642).

144. Reply Brief for the Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 223446, at *1–3.

145. *Parker v. Flook*, 437 U.S. 584, 592 (1978).

146. *Id.*

147. *Id.* at 593.

148. *Id.* at 594.

149. *Id.* at 598 (dissent by Justice Stewart, Justice Rehnquist and Chief Justice Berger).

150. *Id.* at 600.

up again in spectacular fashion. Right after *Flook*, the Supreme Court remanded a § 101 case back to the Court of Custom and Patent Appeals in order to reconsider the impact of *Flook*. In its reconsideration, the lower court found little in *Flook* that changed their reasoning in the remanded case, but the lower court nonetheless engaged in a very strongly worded criticism of *Flook*.¹⁵¹ Judge Rich writing for the majority in the case observed:

with regret that the briefs filed by the Solicitor General for Acting Commissioner Parker in *Parker v. Flook*, a case which, as the Court noted, “turns entirely on the proper construction of § 101,” *badly, and with a seeming sense of purpose, confuse the statutory-categories requirement of § 101 with a requirement for the existence of “invention.”* This they do by basing argument on the opening words of § 101, “Whoever invents or discovers,” thereby importing into the discussion of compliance with § 101 a requirement for “invention” in a patentability sense. But there has not been a requirement for “invention” in the patentability sense in the laws since 1952—the requirement was replaced by the § 103 requirement for nonobviousness. Furthermore, when one has only compliance with § 101 to consider, the sole question, aside from utility, is whether the invention falls into a named category, not whether it is patentable. Falling into a category, does not involve considerations of novelty or nonobviousness and only those two considerations involve comparison with prior art or inquiry as to whether all or any part of the invention is or is not in, or assumed to be in, the prior art or the public domain. Prior art is irrelevant to the determination of statutory subject matter under § 101. An invention can be statutory subject matter and be 100% old, devoid of any utility, or entirely obvious. This is our understanding of the statute and the basis on which we proceed to the further consideration of these appeals.¹⁵²

This missive is notable for a number of reasons. It was not only a somewhat gratuitous detour unnecessary for deciding the case, but it also went beyond disagreement to further alleging a malevolent intent behind the Solicitor General’s brief.

Judge Rich’s rather public rebuke did not go unanswered. It reappeared in 1982 when the Supreme Court decided *Diamond v. Diehr*.¹⁵³ As opposed to the unpatentable method of updating alarm limits in *Flook*, *Diehr* dealt with a case for an improved method for curing cast rubber parts by continuously monitoring the temperature of the mold and thereby continuously recalculated the

151. In re Bergy, 596 F.2d 952, 965 (C.C.P.A. 1979) (noting that “the *Flook* holding appears to have no bearing” on the present case).

152. *Id.* at 962–63 (emphasis added).

153. *Diamond v. Diehr*, 450 U.S. 175, 176 n.23 (1981).

appropriate cure time.¹⁵⁴ As with *Benson* and *Flook* before it, *Diehr* focused on the patent eligibility of the method which “include[d] in several of its steps the use of a mathematical formula and a programmed digital computer.”¹⁵⁵

Unsurprisingly *Diehr* cited to both *Flook* and *Funk*. But what is surprising is that there was no mention of “inventive application” in *Diehr*. Surveying its prior cases while citing to *Funk* and *Flook* the Court summarized *Mackay Radio v. Radio Corp. of America*: “While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.”¹⁵⁶ The Court added this standard from *Mackay* “takes us a long way toward the correct answer.”¹⁵⁷ Applying the standard, the Court said, “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.”¹⁵⁸

Certainly, *Funk* played a role in the case but note that it was again only the first half of the analysis in *Funk* that was being used. What is notable in the opinion is what the Court does not say. Recall in *Funk* the application of a law of nature was not enough. *Funk* required that “it must also satisfy the requirements of invention.”¹⁵⁹ This later “inventive application” part of *Funk* that became a central feature in *Flook* is not cited nor applied. It is just ignored.

That omission did not go unnoticed by Justice Stevens, the author of the Court’s opinion in *Flook*. Justice Stevens dissented in *Diehr* criticizing the majority for ignoring the main thrust in *Flook*.¹⁶⁰ It also gave Justice Stevens a chance to respond to Judge Rich’s blistering criticism from *In re Bergy*.¹⁶¹ Justice Stevens lamented that:

In *Flook*, this Court clarified *Benson* in . . . significant respects. . . . [T]he Court explained the correct procedure for analyzing a patent claim employing a mathematical algorithm. Under this procedure, the algorithm is treated for § 101 purposes as though it were a familiar part of the prior art; the claim is then examined to determine whether it discloses “some other inventive concept.” . . . [I]n general *Flook* was not enthusiastically received by that court. In *In re Bergy*, the majority engaged in an extensive critique of *Flook*, concluding that this Court had erroneously commingled “distinct statutory provisions which are conceptually unrelated.” In subsequent cases, the court

154. *Id.* at 177.

155. *Id.*

156. *Id.* at 188 (quoting *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939)).

157. *Id.*

158. *Id.*

159. *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 131 (1948).

160. *See generally* *Diamond v. Diehr*, 450 U.S. 175, 193-220 (1981) (Stevens, J., dissenting).

161. *Diamond*, 450 U.S. at 204-05.

construed *Flook* as resting on nothing more than the way in which the patent claims had been drafted, and it expressly declined to use the method of claim analysis spelled out in that decision. The Court of Customs and Patent Appeals has taken the position that, if an application is drafted in a way that discloses an entire process as novel, it defines patentable subject matter even if the only novel element that the inventor claims to have discovered is a new computer program. The court interpreted *Flook* in this manner in its opinion in this case. In my judgment, this reading of *Flook* . . . trivializes the holding in *Flook*, the principle that underlies *Benson*, and the settled line of authority reviewed in those opinions.”¹⁶²

Justice Stevens did have reason to dissent. The majority in *Diehr* did seemingly ignore the “inventive application” from *Flook*.

After *Diehr*, “the Supreme Court took a hiatus from addressing patentable subject matter.”¹⁶³ Without an explicit directive to continue to look for an “inventive application,” the soon to be created Court of Appeals for the Federal Circuit did not, on its own initiative, go looking for it.¹⁶⁴ Yet its dormancy was not permanent. Forty years after *Diehr* sidelined it, the *Mayo* Court resurrected “inventive application.”¹⁶⁵ As noted above, criticisms rooted in *Funk*’s connection to § 103 have now reappeared to attack *Mayo*.

Yet, the Court is unlikely to be any more sympathetic to those criticisms than when they first appeared in *Flook*. Nor have the arguments taken hold in scholarship.¹⁶⁶ In fact, as noted above, *Funk* is actually enjoying a renaissance and its profile is dramatically rising.¹⁶⁷ The § 103 based critiques are still unfortunately seen only as the “minority” view.¹⁶⁸ Yet the debate has persisted, as argued in the next two sections, statutory interpretation may well be a critical missing piece of this debate.

162. *Id.*

163. 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, 1298 (2011).

164. *Id.* (“The Federal Circuit, formed shortly after the *Diehr* decision, gradually relaxed the standards for patentable subject matter.”).

165. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 81 (2012).

166. See Rachel Sachs, *The Uneasy Case for Patent Law*, 177 *MICH. L. REV.* 499, 523 n.148 (2018) (“Some scholars view *Funk Brothers* as a case fundamentally about obviousness under 35 U.S.C. § 103. . . . However, the courts themselves view it as a § 101 case and most scholars analyze it in this way.”).

167. See *supra* notes 52-53 and accompanying text.

168. Lefstin, *supra* note 11, at 628 (“A number of commentators, albeit a minority, have therefore taken the view that *Funk Brothers* should properly be regarded as an obviousness case.”).

IV. THE MISSING LINK: UNSTATED, DIVERGENT VIEWS ON THE STRUCTURE OF THE PATENT ACT

Though debate exists in many corners of patent law, the disagreement over the reliance on *Funk* for § 101 feels different. It feels different in kind from a garden variety policy disagreement. Both sides are more vehement and haven't seemingly understood the opposing side. Recall that the *Flook* Court responded to the *Funk* critics by waving the critiques off as being "based on . . . fundamental misconceptions."¹⁶⁹ But the specifics of the misconception are never identified. Likewise the lower court countered that the pro-*Funk* forces had "badly, and with a seeming sense of purpose, confuse[d] the statutory-categories requirement of § 101 with a requirement for the existence of 'invention.'"¹⁷⁰ Such adamant fervor leaves open the possibility that both sides are actually disagreeing on some deeper, yet unidentified level. This section takes up that suggestion and argues that indeed there might be a deeper disagreement fueling this persistent debate. Both sides are disagreeing over basic patent terminology and the core structure of the patent act. The disagreement revolves around the statutory term "the invention." In particular, the disagreement revolves around the relationship between § 101 and § 103.

As argued below, the *Funk* critics see § 101 and § 103 as two independent, distinct hurdles that both need to be cleared.¹⁷¹ And if *Funk* is a § 103 case then it cannot be a § 101 case. The Court (at least in *Flook* and *Mayo*) seems to be operating under a very different understanding where the requirements of patentability are not unique, wholly distinct tests. The Court may well be accepting the argument that *Funk* is best understood as a § 103 case, yet in their view, this is not dispositive. For them, a case like *Funk* might still be relevant for § 101 as their view of the system understands § 103 as a subtest for § 101. In short, even as a § 103 case, *Funk* could still be highly relevant to modern § 101.

As described in more detail above, prior to the 1952 Act, the invention denoted both the technological solution that the patentee had conceived but it also denoted the cleverness of that solution.¹⁷² In the modern parlance, the pre-1952 moniker the "invention" defined both the thing created as well as the non-obviousness of that invention. A technological creation did not earn the label of an invention unless that creation was also non-obvious. And it is that old definition that the Court is still using. With that definition, *Funk* is still relevant for modern § 101.

In contrast, the critics of *Funk* have implicitly adopted a view where the "invention" defines just what was created by the inventor. The novelty or nonobviousness of that invention are regulated by other, separate statutory

169. *Parker v. Flook*, 437 U.S. 584, 592 (1978).

170. *In re Bergy*, 596 F.2d 952, 962 (C.C.P.A. 1979).

171. *See infra* Section IV.C.

172. *See supra* notes 66-74, 80-83 and accompanying text.

requirements. In this view, § 101's requirement that the patentee "invents" relates only to their creation of a technical solution to some problem. The obviousness of that invention is not a matter for § 101. In that view, *Funk* is not relevant for understanding if a patentee has invented and thus is not relevant for modern § 101.

A. Background on "Invention" and the 1952 Act

Starting in the late 1940s, Congress embarked on a major revamp of the patent statute and that work ultimately led to the 1952 Patent Act.¹⁷³ It had two main objectives:

one, the making of various revisions and amendments in the patent law, and the other the codification of the patent statutes and some prior case law. The aspect of codification involves organization, language, arrangement, and matters of that sort, which make the new patent law easier to follow and understand, and hence a better working tool, than the prior statutes.¹⁷⁴

As to codification and clarification, one area that needed attention was the term "invention." By the 1940s, invention "came to be used to refer to the thing invented and also to some vague quality necessary to patentability."¹⁷⁵ And this dual, layered usage led to confusion. It led to a patent system where it was entirely possible that an "invention (in the concrete sense) [might be found] unpatentable because it is not an invention (in the abstract sense)."¹⁷⁶ The concrete invention referred to the thing that the patentee had created while the requirement of "invention" addressed the quality or merits of that creation. This latter hurdle examining whether the purported advance was new enough and clever enough relative to the prior art came to be known as "the requirement of invention." This unfortunate usage naturally led to confusion where it was acceptable to say that an invention was not patentable because it lacked invention.¹⁷⁷

Importantly, this dual usage appears in *Funk*. Recall that the analysis in *Funk* proceeded in two stages. First, did the patentee apply the discovery of the noninhibition of bacterial strains? There the Court found that indeed the patentee had applied the discovery in creating the mixture of non-inhibiting strains. In other words, when considering the concrete usage of the term invention, the patentee in *Funk* had actually invented. A discovery alone is not

173. P. J. Federico, *Commentary on the New Patent Act*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 167 (1993).

174. *Id.* at 170.

175. Giles S. Rich, *Principles of Patentability*, in NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY, at 2:9 (John F. Witherspoon ed., 1980).

176. Giles S. Rich, *The Vague Concept of "Invention" as Replaced by § 103 of the 1952 Patent Act*, 14 FED. CIR. B.J. 147, 162 (2004/2005).

177. Giles S. Rich, *Why and How Section 103 Came to Be*, 14 FED. CIR. B.J. 181, 191 (2004).

an invention but an application of it for a useful purpose is. Bond had applied his insight and non-inhibiting mixture of pre-existing bacteria was an invention (in the concrete sense). But *Funk* required more. In the second part of the analysis, the Court took the concrete thing created by the patentee (i.e. the mixture of noninhibiting bacteria) and asked further does that concrete invention satisfy “invention.” As noted above, it is here that Bond’s patent faltered. The Court held that the patent did not meet this requirement of “invention.”

Importantly, of the two usages, it was the latter one that was causing confusion for patent law in the late 1940s. The requirement of “invention” was a wholly ill-defined standard. As early as 1891, the Court even admitted that:

What shall be construed as invention within the meaning of the patent laws has been made the subject of a great amount of discussion in the authorities, and a large number of cases, particularly in the more recent volumes of reports The truth is the word cannot be defined in such manner as to afford any substantial aid in determining whether a particular device involves an exercise of the inventive faculty or not. In a given case, we may be able to say that there is present invention of a very high order. In another we can see that there is lacking that impalpable something which distinguishes invention from simple mechanical skill.¹⁷⁸

And some sixty years later the issue had not been clarified. In fact, the confusion had worsened. Judge Learned Hand famously commented at the time that “[the requirement of invention] is as fugitive, impalpable, wayward, and vague a phantom as exists in the whole paraphernalia of legal concepts.”¹⁷⁹

This confusion did catch the eye of the drafters of the new patent act. The ill-defined requirement of “invention” was one of the two major “changes” of the 1952 Act.¹⁸⁰ In particular the requirement of “invention” was codified into the new obviousness provision of § 103. The Senate Report relates that:

Section 103, for the first time in our statute, provides a condition which exists in the law and has existed for more than 100 years, but only by reason of decisions of the courts. An invention which has been made, and which is new in the sense that the same thing has not been made before, may still not be patentable if the difference between the new thing and what was known before is not considered sufficiently great to warrant a patent. That has been expressed in a

178. *McClain v. Ortmayer*, 141 U.S. 419, 426–27 (1891).

179. *Harries v. Air King Prods. Co., Inc.*, 183 F.2d 158, 162 (2d Cir. 1950).

180. S. REP. NO. 82-1979, at 4 (1952) (“The major changes or innovations in the title consist of incorporating a requirement for invention in § 103 and the judicial doctrine of contributory infringement in § 271.”).

large variety of ways in decisions of the courts and in writings. Section 103 states this requirement in the title.¹⁸¹

Later, in *Graham*, the Court recognized the import of the 1952 Act:

The first sentence of [§ 103] is strongly reminiscent of the language in *Hotchkiss*. Both formulations place emphasis on the pertinent art existing at the time the invention was made and both are implicitly tied to advances in that art. The major distinction is that Congress has emphasized “nonobviousness” as the operative test of the section, rather than the less definite “invention” language of *Hotchkiss* that Congress thought had led to “a large variety” of expressions in decisions and writings. In the title itself the Congress used the phrase “Conditions for patentability; non-obvious subject matter,” thus focusing upon “non-obviousness” rather than “invention.”¹⁸²

The Court recognized that indeed its prior precedents that had created the requirement of “invention” had now been renamed and codified into the patent statute in § 103.

In light of that history, the multitude of cases that preceded the 1952 Act that, like *Funk*, were decided based on the requirement of “invention” might be relevant for understanding § 103.¹⁸³ But, that still leaves open the question whether any of those older cases like *Funk* are still appropriate for understanding modern § 101.¹⁸⁴ In other words, all of *Funk*'s analysis purports to be interpreting the requirement that a patentee “invented or discovered,” and today's § 101 still requires that a patentee “invents or discovers.” We need more to conclude that *Funk* should not be used for today's § 101.

B. SCOTUS: Obviousness as a Test for Invention

The one way that *Funk* could be still relevant for modern § 101 is if the term “invents” did not change meaning with the 1952 Act. Examining *Flook* as well as other cases makes clear that the Court was, at times, operating under the assumption that “invents” had not changed meaning. *Flook* is the primary route by which *Funk* has entered into modern § 101 jurisprudence, and as discussed

181. *Id.* Already in this particular quote it is clear that Congress was using “invention” only in the sense of the thing created. The usage makes clear that invention may not be patentable if it is obvious. Earlier, a conclusion that something was an invention or exhibited invention was a conclusion that the thing was nonobvious and patentable.

182. *Graham v. John Deere*, 383 U.S. 1, 13–14 (1966).

183. See generally Shine Tu, *Funk Brothers—An Exercise in Obviousness*, 80 UMKC L. REV. 637 (2012) (arguing that *Funk* is a § 103 case).

184. All the prior commentators that have rightfully identified *Funk* as a proto-obviousness case have done so generally with the hope of further implying that *Funk* should not be used for § 101. This later hope, without more, does not necessarily follow and indeed courts have continued to follow *Funk*, despite strong evidence from commentators that *Funk* is a requirement of invention case. What is needed instead is not just that *Funk* is a proto-§ 103 case, but rather, the additional result that *Funk* should not be used for modern § 101.

above, the briefing in *Flook* was critically important in this regard.¹⁸⁵ And though *Flook* does not come out and explicitly detail its interpretation of “invents,” examination of the briefing and especially how the statutory term the “invention” was used in those briefs is quite important. On inspection it becomes clear that the Solicitor General was utilizing the term using the old pre-1952 definition. Furthermore, this is not the only evidence of the Courts views on the invention. Other contemporaneous Supreme Court cases similarly prove that the Court was indeed continuing to use the older definition of the invention.

As mentioned above, the Solicitor General relied on three contemporary cases to justify reliance on *Funk* for modern § 101.¹⁸⁶ The brief focused on *Davison Chemical*,¹⁸⁷ *National Lead*,¹⁸⁸ and *Armour Pharmaceutical Co.*¹⁸⁹ These cases were pivotal in bringing *Funk* into § 101. Examination of these cases makes clear that they were utilizing the older interpretation of the invention that included the requirement of invention.

Davison Chemical was a 1950 Seventh Circuit case confronting a patent for an improved method of making silica gels.¹⁹⁰ A general process existed in the prior art, but the patentee “discovered for the first time that a definite relationship exists between the temperature of the wash water and the porosity of the final product.”¹⁹¹ Armed with that new understanding, the patentee applied for patent claiming a process for making gels with the improvement that the new process could control the gel porosity by adjusting the temperature of the heated water.¹⁹² In finding the patent invalid, the appellate court cited *Funk*.¹⁹³ The court noted that “[t]he application of the law must be novel and *inventive* in character.”¹⁹⁴ The court held that the claimed process was not patentable because “[i]nvention was not involved.”¹⁹⁵ Notably asking for requirements beyond an application of a law of nature and especially asking for something “inventive” in character clearly is still utilizing the older notion of the invention.

In *Davison*, this usage is not surprising. Importantly the case was decided *prior* to the 1952 Patent Act. One would expect the lower courts to follow the Supreme Court. And indeed, as noted above, this case was a fairly straightforward application of *Funk* and accordingly the court in *Davison* held

185. See *supra* notes 56-58 and accompanying text.

186. See *supra* note 138 and accompanying text.

187. *Davison Chem. Corp. v. Joliet Chems.*, 179 F.2d 793, 794 (7th Cir. 1950). Note that the C.C.P.A. followed *Davison* in *In re Arnold*, 185 F.2d 686 (C.C.P. A. 1950).

188. *Nat'l Lead Co. v. W. Lead Prods. Co.*, 324 F.2d 539, 542 (9th Cir. 1963).

189. *Armour Pharm. Co. v. Richardson-Merrell, Inc.*, 264 F. Supp. 1013, 1015 (D. Del. 1967), *aff'd*, 396 F.2d 70 (3d Cir. 1968).

190. *Davison Chem.*, 179 F.2d. at 793.

191. *Id.* at 794.

192. *Id.*

193. *Id.* at 795.

194. *Id.* at 795 (emphasis added).

195. *Id.* (quoting *Am. Lecithin Co. v. Warfield Co.*, 128 F.2d 522, 526 (7th Cir. 1942)).

that the patent failed the requirement of “invention.”¹⁹⁶ Nonetheless, when relied upon in 1978, the Court should have understood that the older usage of invention was at the heart of the court’s decision.

The next case that was important in the *Flook* decision was the 1963 Ninth Circuit case of *National Lead*.¹⁹⁷ It dealt with a patent claiming a process for producing a mixture of differing lead crystals where the color of the resulting mixture was determined by the ratio of the two crystal types.¹⁹⁸ Similar to *Davison*, a generalized process existed in the prior art for creating a lead particle mixture.¹⁹⁹ The patentee was the first to discover that the temperature of one of the processing steps “has a direct effect upon the amounts and relative proportions [of the crystal components].”²⁰⁰ And accordingly, the patentee claimed the improved process that enabled control of the resulting mixture by better controlling the temperature of the one processing step. The court invalidated the patent.²⁰¹ It explicitly cited the obviousness requirement of 35 U.S.C. § 103, noting that it provided the “determinative principle to be applied in the deciding the issue before us.”²⁰² In making its obviousness analysis, the court examined not only the prior art, but also issues like “commercial success” and “long felt need.”²⁰³ Yet ultimately, the Court cited the “strikingly similar” *Davison* case and concluded that the “patent is invalid for lack of invention.”²⁰⁴

Decided in 1963, *National Lead* is obviously a post-1952 case and it explicitly cited § 103. The court found that the patent was obvious, but it described this as a “lack of invention.”²⁰⁵ And the court did not seem hesitant to apply *Funk* and *Davison* to the new § 103 even though *Funk* and *Davison* were both pre-1952 cases. In other words, the court understood a finding of obviousness as a lack of invention.²⁰⁶ The court in this case is operating under the assumption that invention meant what it meant prior to 1952 and that a finding of obviousness meant that the patent lacked invention.

Lastly the briefing in *Flook* also relied on *Armour Pharmaceutical Co.* It is a 1968 case decided in the Third Circuit.²⁰⁷ This case revolved around a patent

196. *Id.* A similar conclusion was reached by the C.C.P.A based on *Funk*, finding that the patentee’s work once compared against the prior art was “not invention.” See *In re Arnold*, 185 F.2d 686, 691 (C.C.P.A. 1950).

197. *Nat’l Lead*, 324 F.2d at 541.

198. *Id.* at 540.

199. *Id.* at 541.

200. *Id.*

201. *Id.* at 545–46.

202. *Id.* at 544.

203. *Id.* at 545–46.

204. *Id.* at 541, 545–46.

205. *Id.* at 544–46.

206. See Note, *Standard of Patentability-Judicial Interpretation of Section 103 of the Patent Act*, 63 COLUM. L. REV. 306, 323–325 (1963).

207. *Armour Pharm. Co. v. Richardson-Merrell, Inc.*, 264 F. Supp. 1013, 1015 (D. Del. 1967).

for orally administrable trypsin used as an anti-inflammatory agent.²⁰⁸ Trypsin had already been used as an anti-inflammatory agent but in those cases trypsin had been delivered by injection and other methods but not orally.²⁰⁹ Oral administration was thought to be unworkable for numerous reasons.²¹⁰ Undaunted, the patentee performed some experiments on rats discovering that trypsin could in fact be effectively absorbed by mammalian small intestines and could treat inflammation in the rats.²¹¹ Furthermore, those experiments identified that “the optimal point for absorption was the ileum—the lower third of the small intestine”²¹² In order for an orally administered agent to reach the ileum, prior art methods taught the use of an enteric coating on the agent to enable the agent to survive the trip through the low pH environment of the stomach through to the small intestines.²¹³ Consequently, the patentee, armed with his new discovery, combined these ideas and filed a patent application on an enterically coated trypsin composition designed to release the trypsin in the ileum.²¹⁴

The District Court examined the patent and found that it did not meet “the requisite standard of invention set forth in 35 U.S.C.A. § 103 (1952).”²¹⁵ As in *National Lead*, the court noted that “*Davison* is strikingly analogous to the present case” and the court held that the new use of trypsin in the patent “was not invention under § 103.”²¹⁶ The Third Circuit affirmed.²¹⁷ In its opinion, the appellate court spent significant space discussing the patentee’s work while considering the fundamental prohibitions on patents on discoveries of nature established by cases like *LeRoy v. Tatham*.²¹⁸ Accepting that basic rule as sound, the Court of Appeals distinguished the work of the patentee, noting:

On the other hand, [the patentee] has not based his patent on the discovery that the ileum will absorb trypsin. He claims an enterically coated trypsin for use as an anti-inflammatory agent. *Thus, it would seem that allowing a patent on the restricted use Martin made of his discovery of a natural phenomenon would not only be consistent with our patent laws, but would further their purpose.* The employment of the newly discovered principle of nature would remain open to all those desiring to utilize it. We discern no requirement in the policy of

208. *Id.* at 1014.

209. *Id.* at 1013–14.

210. *Id.*

211. *Id.* at 1014–15.

212. *Id.* at 1015.

213. *Id.* at 1016.

214. U.S. Patent 3,004,893 claim 1 (filed Oct. 21, 1959).

215. *Armour Pharm. Co.*, 264 F. Supp. at 1017.

216. *Id.* at 1016–17.

217. *Armour Pharm. Co.*, 396 F.2d at 75.

218. *Id.* at 71–73.

the patent law that the method by which the discovery be utilized also be a new method.²¹⁹

In other words, judged against the letter and spirit of the traditional rule drawn by cases like *LeRoy*, the patentee's work cleared the hurdle. But the court did not stop there. It went on to note that it was further bound by subsequent cases. In particular, the court stated, "the Supreme Court [citing *Funk*] and several courts of appeals have held to the contrary."²²⁰ The court then launched into an extended discussion of *Funk*, and it distilled the following rule:

Our reading of the Supreme Court's opinion in *Funk* leads us to conclude that the test of patentability of a natural phenomenon is as follows: Would an artisan, knowing the newly discovered natural phenomenon require more than ordinary skill to discover the process by which to apply that phenomenon as the patentee had done?²²¹

And based on that rule, the appellate court affirmed the judgment below finding the patent invalid.²²² The appellate court affirmed that the patent was invalid because, as held by the district court, it was "not invention under § 103."²²³ Critically for this article, this usage indicates that both the district court and appellate court understood obviousness just as a test for the lack of invention. Again, invention included nonobviousness.

These three cases were central features in the Solicitor General's briefing in *Flook* and those cases clearly are interpreting invention in its pre-1952 understanding. And in addition to those particular cases, the Solicitor General's brief itself further makes clear its interpretation embracing the older usage of the invention. Summing up those cases, the brief argued, "[i]n each of these cases the courts held that no patent should have been granted, because there was no invention in devising the claimed embodiment once the patentee had possession of the idea (which was unpatentable as such)."²²⁴ And with that understanding, the brief clearly sees *Funk* as appropriate for § 101 as *Funk* is instructive about the lack of invention.

But even outside *Flook*, other Supreme Court cases from the 1960s and 1970s make it even more clear that the Court on occasion still used "invention" in patent law to include a non-obviousness component. Most notably, in 1969, the Court in *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.* concluded that "to those skilled in the art the use of the old elements in combination was *not an invention by the obvious-nonobvious standard*. Use of the radiant-heat burner in this important field marked a successful venture. But as noted, more than that

219. *Id.* at 73 (emphasis added).

220. *Id.* at 74.

221. *Id.*

222. *Id.* at 75.

223. *Armour Pharm. Co.*, 264 F. Supp. at 1017; *Armour Pharm. Co.*, 396 F.2d at 75.

224. Brief for the Petitioner, *Parker v. Flook*, 437 U.S. 584 (1978) (No. 77-642), 1978 WL 206636, at *21 n.19.

is needed for invention.”²²⁵ Here, the Court is conceptualizing obviousness as a test for invention. The Court is using the older, pre-1952 understanding of the invention.

In 1976, the Court heard *Dann v. Johnston*, a case explicitly focusing only on § 103. In that case, the Court declared that “[a]s a judicial test, ‘invention’—i.e., ‘an exercise of the inventive faculty,’—has long been regarded as an absolute prerequisite to patentability.”²²⁶ Here, the Court again is weaving an obviousness component into the concept of the invention.

And later that year, the Court in *Sakraida* went even further. The district court in the case held that the patent

does not constitute invention, is not patentable, and is not a valid patent, it being a combination patent, all of the elements of which are old in the dairy business, long prior to 1963, and the combination of them as described in the said patent being neither new nor meeting the test of non-obviousness.²²⁷

It further concluded that “to those skilled in the art, the use of the old elements in combination was not an invention by the obvious-nonobvious standard. Even though the dairy barn in question attains the posture of a successful venture, more than that is needed for invention.”²²⁸ The district court was understanding obviousness as a test for invention. The district court was surely still using the old interpretation of the invention.

When *Sakraida* reached the Supreme Court, it too used that same interpretation, and it even raised the “invention” standard to a Constitutional requirement.²²⁹ In discussing obviousness and § 103 the Court held that “[i]t has long been clear that the Constitution requires that there be some “invention” to be entitled to patent protection.”²³⁰ And the Court concluded by holding that “without invention will not make patentability.”²³¹

In all these cases it is clear that the Court was operating under the assumption that the term “invention” includes a non-obviousness component. The Court was clinging to the pre-1952 concept of the invention even for cases decided well after 1952. With that understanding the Court would feel perfectly at ease citing to *Funk* in interpreting § 101 and its requirement that the patentee “invents.” What the Court has not yet confronted is whether its implicit

225. *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62–63 (1969) (emphasis added).

226. *Dann v. Johnston*, 425 U.S. 219, 225 (1976).

227. *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 274 (1976).

228. *Id.* at 278–279.

229. *Id.* at 279.

230. *Id.* at 278–279. A look to Article I § 8 clause 8 of the United States Constitution indeed finds that the United States patent system is limited to “Inventors.” Yet the Court does not make clear what is actually required to be an inventor. U.S. Const. art. I § 8 cl. 8.

231. *Sakraida*, 425 U.S. at 282–83 (quoting *Great A. & P. Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 153 (1950)).

interpretation that was so important in *Flook* (and therefore in *Mayo*) can be correct in the light of the text of the 1952 Act. As shown in more detail below, when the structure of the Act is considered it becomes clear that the Court cannot be interpreting the “invention” correctly.

C. The Patent Bar & the Federal Circuit: The 1952 Patent Act Redefined the Invention

As described above, the Court (on occasion) has used the old understanding of the “invention” even for post-1952 cases. In particular, in that view, obviousness (though housed in its own statutory provision) is still be understood as a test for “invention.” As such, *Funk* and its focus on “invention” would still appear highly relevant and appropriate for modern § 101 and its requirement that the patentee “invents.”

But not all courts have seemed to use that interpretation. In other places, the Supreme Court appears to assume that “invents” did change meaning after 1952. Lower courts (like the C.C.P.A and later the Federal Circuit) have also embraced that view. For them, not only did the 1952 Patent Act create the obviousness requirement but the Act also redefined the “invention.” Rather than continuing to incorporate an obviousness component into its definition, the “invention” was now stripped down to identify only the thing created. P.J. Frederico, one of principle drafters of the 1952 Patent Act, emphasized in his commentary that “The word ‘invent’, as used in section 101 for example, does not incorporate ‘new’ within its meaning.”²³² And as a corollary, if novelty is no longer implied by the “invention” then obviousness is certainly no longer implied either.²³³

From the point of view of terminology, this clarified discourse. Prior to the Act, it was possible to state that an “invention (in the concrete sense) [might be found] unpatentable because it was not an invention (in the abstract sense).”²³⁴ By removing the requirement of invention from the statutory term the “invention” and moving it entirely to the newly created obviousness requirement, the Act improved what had been a confusing linguistic structure.

232. Frederico, *supra* note 173, at 180 (later reiterating that “The words ‘invent’ and ‘inventor’ as used in sections 101 and 102, as has been stated, do not in themselves import any meaning of novelty, and are used in the sense of ‘is the author of’ and ‘author’. . .”).

233. See 35 U.S.C. § 103 (structuring obviousness such that nonobvious inventions are a proper subset of novel inventions). In other words, the structure of § 103 makes plain that an invention that is “identically disclosed as set forth in section 102” would be always obvious as there would be zero difference between the invention and the explicit teachings of the prior art. Consequently, if the invention no longer implies novelty, it also certainly no longer implies non-obviousness.

234. Giles S. Rich, *Principles of Patentability*, in NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY, at 2:1, 2:9 (John F. Witherspoon ed., 1980).

Now a similar sentiment about unpatentability could be communicated with more clarity by stating that an invention is not patentable because it is obvious.²³⁵

This understanding of the invention clarified discourse but it also suggested an inherent structure to the patent act. Section 101 requires that the patentee “invents.” Then § 102 winnows down all the inventions further allowing only novel inventions to pass through. Lastly, § 103 then winnows novel inventions further allowing only non-obvious inventions to emerge as patentable inventions.

This view was emphasized by the lower courts in part in response to cases like *Anderson’s Black Rock*. For example, in 1973 the Court of Customs and Patent Appeals heard *Application of Fielder*. The court dealt with an obviousness dispute and a brief in the case quoted from *Anderson’s-Black Rock* for the proposition that commercial success or long felt want “without invention will not make patentability.”²³⁶ If argument presented here is correct and the lower courts did indeed think that “invents” had changed in 1952, then these lower courts would be troubled by the language in *Anderson’s-Black Rock*. And indeed, even before getting to the substance of the argument the lower court went out of its way to correct what it perceived was an error in terminology. It noted that “[t]his court has sought to move away from the language of ‘invention’ and focus on the conditions of patentability prescribed in title 35 of the United States Code, specifically § 103 thereof, in accordance with the mandate in *Graham*.”²³⁷

Around the same time scholarly commentary in response to *Anderson’s Black Rock* also emphasized the view that the 1952 Patent Act had redefined the “invention.” It no longer involved any connotation of cleverness. Instead, those descriptors were left for the separate requirement of obviousness. They argued that “the Act retained the term ‘invention,’ but assigned to it a meaning wholly inconsistent with the previous usage of the phrase. ‘Invention’ was defined as the thing discovered or created and sections 101-103 set forth the conditions for ascertaining whether a particular invention was patentable.”²³⁸

And though multiple Supreme Court cases like *Anderson’s-Black Rock*, *Sakraida*, and *Dann v. Johnston* seem to rely on the pre-1952 idea of the “invention,” other Supreme Court cases have seemingly taken the opposite understanding and have agreed with the Federal Circuit and the general consensus from the Patent Bar. In its most important opinion exploring the 1952 Act and § 103, the Supreme Court in *Graham v. John Deere* notably used the

235. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983) (discussing secondary factors and noting that “may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious was not”).

236. *In re Fielder*, 471 F.2d 640, 645 (C.C.P.A. 1973).

237. *Id.*

238. Herbert Mintz & Charles L. O’Rourke, *After Black Rock: New Tests of Patentability—The Old Tests of Invention*, 39 GEO. WASH. L. REV. 123, 137 (1970).

term “invention” only when referencing the thing created by the patentee.²³⁹ In addition the Court ultimately found Graham’s invention to be obvious under § 103. In other words, labeling something as an invention did not imply that it was nonobvious. This usage is further cemented when the Court outlined that the purpose of the obviousness requirement had been “to develop some means of weeding out those inventions which would not be disclosed or devised but for the inducement of a patent.”²⁴⁰ Again, the Court makes clear that some inventions would fail this test—a thing could be an invention, yet it could still be obvious. In the eyes of the *Graham* court, an obvious invention is a coherent description of a patent eligible creation that failed § 103. Furthermore, where the Court did directly quote from *Hotchkiss* and its “degree of skill and ingenuity which constitute essential elements of every invention” the Court went out of its way to make clear that as used in *Hotchkiss* “invention” was “a word of legal art signifying patentable invention[.]”²⁴¹ The *Graham* Court seemed to be operating under the assumption that “invention” had changed meaning with the 1952 Act.

And perhaps most importantly the Court also seemed to adopt the new, refined view of “invention” in *Diamond v. Diehr*. In explaining the purpose and construction of the patent statute, the Court explained that § 101 has distinct concerns from § 102 and § 103. Most importantly for this discussion, the Court made clear that an obvious invention is not just cogent use of terminology but that it is something that is clearly contemplated by the statute. The Court explained:

In this case, it may later be determined that the respondents’ process is not deserving of patent protection because it fails to satisfy the statutory conditions of novelty under § 102 or nonobviousness under § 103. A rejection on either of these grounds does not affect the determination that respondents’ claims recited subject matter which was eligible for patent protection under § 101.²⁴²

The Court is making it quite clear that something can pass § 101 and yet it could fail to survive novelty or nonobviousness. In other words, in the Court’s understanding of the statutory language, an invention (i.e. something that survives § 101), can be old and it can be obvious. The “invention” as used in *Diehr* does not include creativeness. In *Diehr* the Court has implicitly concluded that the 1952 Patent Act changed the meaning of the “invention” and the meaning of “invent or discovers” in modern § 101.

239. *Graham v. John Deere*, 383 U.S. 1, 4 (1966) (describing Graham’s “invention” as “a combination of old mechanical elements, involves a device designed to absorb shock from plow shanks as they plow through rocky soil and thus to prevent damage to the plow.”).

240. *Id.* at 11.

241. *Id.*

242. *Diamond v. Diehr*, 450 U.S. 175, 191 (1981).

D. The Question Resurfaces in Mayo

As mentioned above, after *Diehr* the Supreme Court took a long hiatus from patentable subject matter. It was not until 2006 that the Court showed a renewed interest with its grant of certiorari in *LabCorp v. Metabolite*.²⁴³ Though the case was ultimately dismissed as certiorari improvidently granted, it does shed a light onto the perceived status quo at the time. In their brief recommending denial of certiorari, the Solicitor General described its understanding of patentable subject matter and especially the relationship between *Flook* and *Diehr*.²⁴⁴

The brief laid out a hypothetical claim and described how it would have fared under the tests from *Flook* and *Diehr*. The brief described a claim that “necessarily involved the transformation of matter and did not comprise every substantial practical application of a natural phenomenon.”²⁴⁵ From that hypothetical the brief posed “the next question . . . whether compliance with those criteria alone would suffice to bring the claim within the scope of patentable subject matter under Section 101.”²⁴⁶

The brief argued that the answer depended on which case still prevailed. It explained that “[a]t least before this Court decided *Diehr*, the answer would appear to have been no. In *Flook*, this Court held that ‘the discovery of a natural phenomenon cannot support a patent unless there is some other *inventive* concept in its application.’”²⁴⁷ But the brief went on to explain that (in its understanding) *Diehr* had changed that. The brief noted that “[t]his Court’s subsequent decision in *Diehr* . . . appears to have taken a broader view of patentable subject matter than some language in *Flook* might have been read to suggest, and it has been viewed as being in tension with *Flook*.”²⁴⁸ And the brief relayed that “[s]ince this Court decided *Diehr* almost 25 years ago, PTO has generally followed the Federal Circuit’s understanding that *Diehr* substantially limited *Flook*.”²⁴⁹ The brief from the Solicitor General simply argued that the status quo was fine, and therefore certiorari should be denied. There was nothing amiss as the PTO was simply following the latest pronouncement from the Court on § 101. And notably in that last word on the subject, *Diehr* never mentions (but also never overturns) *Flook*’s “*inventive application*” requirement.²⁵⁰

Though it seems accurate to describe this as the consensus view of § 101 around 2006, it would be wrong to think that the consensus was built on a solid foundation. After all, *Flook* and *Funk* were never overruled. Instead, they were

243. *LabCorp v. Metabolite, Inc.*, 548 U.S. 124 (2006).

244. *See generally* Brief for the United States as Amicus Curiae, *LabCorp v. Metabolite, Inc.*, (2005) (No. 03-1120), 2005 WL 2072283.

245. *Id.* at *11.

246. *Id.*

247. *Id.*

248. *Id.* at *12.

249. *Id.* at *14.

250. The only mention is in the dissent where Justice Stevens argues that the test in *Flook* has been largely ignored in *Diehr*.

both approvingly (if only selectively) cited in *Diehr*. There were real questions as to the continued relevance of *Funk* and *Flook*. As emphasized in this article, a very helpful way to understand the *Flook/Diehr* confusion would be to see it as confusion over the exact definition of the “invention” in § 101. And as demonstrated above, there was ample evidence of confused usage of the term.

A few years after *Metabolite*, a new case arrived that provided a glimmer of hope that perhaps these issues about § 101 would be finally resolved. In 2011, the Court agreed to hear *Mayo Collaborative Services v. Prometheus Laboratories*.²⁵¹ In the briefing these issues once again resurfaced. In arguing for a re-emergence of *Flook*, the petitioner argued that “[w]ell-known, non-inventive steps cannot turn a natural phenomenon into patentable subject matter.”²⁵² The respondents countered arguing that:

This Court [in *Diehr*] could not have stated that point more clearly than when it said, without qualification, that considerations of the novelty or nonobviousness “of any element or steps in a process, or even of the process itself,” are of “no relevance in determining whether the subject matter of a claim falls within the §101 categories of possibly patentable subject matter.”²⁵³

The parties were clearly staking out opposite positions on the divide between *Flook* and *Diehr*. Yet neither side addressed the deeper, statutory divide that also separates the two cases. There were a number of amicus briefs filed in the case and one amicus brief did start the important work of engaging with the question of statutory interpretation of “invention.” Prof. Joshua Sarnoff submitted a brief supporting the petitioners with full-throated arguments focusing on the standards found in *Funk* and *Flook*.²⁵⁴ Prof. Sarnoff’s brief rightfully saw the need to engage with statutory interpretation. After explaining that *Funk* still prohibited patents with only “uncreative applications” of nature laws, the brief immediately followed that discussion of *Funk* with the heading “The 1952 Patent Act Preserved the Requirement for Inventive Creativity in Section 101.”²⁵⁵

And even though, as suggested by the title, this article disagrees with his ultimate conclusion on statutory interpretation, the brief should still be praised for at least opening up the question of statutory interpretation for the § 101 debate. Sarnoff marshals a number of arguments to support his view that the 1952 Patent Act did not change the meaning of “invention” and thus a case like *Funk* could and should still be used to inform modern § 101. First, Sarnoff

251. 566 U.S. 66 (2012).

252. Brief for Petitioner, *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, (2011) (No. 10-1150), 2011 WL 3919717, at *36.

253. Brief for Respondent, *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, (2011) (No. 10-1150), 2011 WL 5189089, at *29–30.

254. See generally Brief of Nine Law Professors as Amici Curiae in Support of Petitioners, *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, (2011) (No. 10-1150), 2011 WL 4071921.

255. *Id.* at *22.

argues that, if Congress had intended to change the meaning of “invention” then it would have more expressly said so. Furthermore, Sarnoff argues that the 1952 Act maintained the previous interpretations because, as stated by the Court in *Graham*, the standard for patentability had been changed by the Act. These arguments are addressed in the next section.

V. THE CRITICS HAVE IT RIGHT: DON’T CITE *FUNK* FOR § 101

The above discussion shows that there exists an important divide in patent law that has not been resolved. There is a divide over the structural relationship between the creation of obviousness and the statutory meaning of the “invention” in modern patent law. Does the “invention” as understood for modern patent law still indicate the nonobviousness of the creation as seemingly thought by the Supreme Court in cases like *Flook*? Or was the “invention” redefined in 1952 to define only the thing created as embraced by the lower courts and the patent bar? This section takes up that question.

Ultimately this section will argue that the definition of the invention that implicitly runs through *Flook* and *Mayo* cannot be correct. In short, the critics of *Funk* have had it right all along. The 1952 Patent Act, though “not intended by Congress to change the general level of patentable invention” did change the meaning of “invention” within the Act.²⁵⁶ Importantly, the statute created the obviousness requirement, but it also fully removed those concerns from the “invention.” The result is that, after 1952, the requirement of invention cases like *Funk* are no longer relevant for understanding the “invents or discovers” language of modern § 101. But before getting to those arguments, this section opens by showing that there are reasons that patent law has confused this issue.

A. Confusion over “Invention”

In the above discussion, it was pointed out that the Supreme Court has a confused history regarding its seeming understanding of the “invention.” And though the question does seem to have a definite answer, even those that later became the most vocal about the 1952 Act, admit that making mistakes with usage is all too easy. Giles Rich gave a speech in 1952 discussing the new Patent Act where he stated that “section 103 was a ‘statutory inclusion of a requirement of invention’” and that “a patent cannot be granted if invention is wanting.”²⁵⁷ Twenty five years later Judge Rich lamented those words declaring that “I want the world to know I would say them differently now.”²⁵⁸ Yet he explained that he was just “using habitual terminology” that “patent lawyers had been using for a century.”²⁵⁹ And it was “rather slowly” that he “learned to appreciate how

256. *Graham*, 383 U.S. at 13, 16–17.

257. Giles S. Rich, *Why and How Section 103 Came to Be*, 14 FED. CIR. B.J. 181, 191 (2004).

258. *Id.*

259. *Id.*

important it was to stop using that terminology.”²⁶⁰ And he admitted that it would take time for others to fully comprehend that the statute had changed how we should talk about the patent system.²⁶¹

And that confusion carries over to today. In one of the most recent detailed histories of the requirement of invention and obviousness, Professor John Duffy describes “the law and theory as they exist today” and he sums up that “this general requirement, which will be referred to here as nonobviousness, is now recognized throughout the world as the essence of invention.”²⁶² Later he reemphasizes the point that “nonobviousness is . . . now generally considered to be the defining feature of invention.”²⁶³ Though never addressing the relationship between obviousness and modern § 101, his usage, if taken literally, would support the use of obviousness like issues in determining whether someone has “invent[ed]” under § 101. For present purposes, such a usage of the invention would support the use of *Funk* for modern § 101.

B. *The Invention Did Change Meaning in 1952*

This section argues that the implicit definition of the invention that runs through *Flook* and *Mayo* cannot be correct. Instead, an understanding of the “requirement of invention” would only be relevant to understanding § 103, not § 101. Put another way, obviousness replaced discussion of the requirement of invention and obviousness was not a test that determined the presence or lack of invention. In other words, invention after 1952 no longer meant what it had come to mean prior to 1952. The text of the 1952 Act makes clear that the invention refers to the specific concrete thing created by the patentee. It no longer includes an assessment about the quality of the creation. The structure of both novelty in § 102 and nonobviousness in § 103 makes this interpretation clear.

The novelty provision in § 102 states that, for example, “a person shall be entitled to a patent unless . . . the invention was known by others . . . or [the invention] was described in a printed publication.”²⁶⁴ If the thing has been previously described in a printed publication, it does not stop being an invention. It is just not a novel invention. Congress is using the invention only for the thing conceived and disclosed and claimed by the patentee. Novelty is not an inherent property of an invention. Some inventions will be novel while others will not. For the 1952 Act, Congress used the invention only for the thing conceived, disclosed, and claimed by the patentee.

260. *Id.*

261. *Id.* (“If I, as one who insisted on keeping the term ‘requirement of invention’ out of the statute was slow to see the need for better clarity of expression, it is not surprising that others have been.”).

262. John F. Duffy, *Inventing Invention: A Case Study of Legal Innovation*, 86 TEX. L. REV. 1, 6 (2007).

263. *Id.* at 2.

264. See 35 U.S.C. § 102.

A similar argument applies to § 103 and obviousness. The Act makes clear that even among inventions that survive the novelty requirement, there will be some that are obvious and others that are nonobvious. Section 103 states:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious.²⁶⁵

With this text, Congress is again using the invention only to refer to the thing conceived. The structure of § 103 clearly contemplates inventions that are obvious. This definition is just not compatible with the older interpretation where non-obviousness was an inherent part of being an invention. An obvious invention is simply incoherent in a world where the moniker “invention” only attaches to things that have cleared the requirement of invention.

Both of these provisions use the word invention such that it cannot inherently include a requirement of non-obviousness. The invention, the thing that a patent applicant must ‘invent’ for § 101 purposes, is not inherently novel or nonobvious. In other words, the statute is written with the notion that there needs to be an invention—that is § 101. Looking to § 102, some inventions will not be novel and only novel inventions pass muster for § 102.²⁶⁶ Similarly, looking to § 103, some novel inventions will be obvious to people of skill and § 103 prevents those obvious (though novel inventions) from receiving a patent. Ultimately when put together, the statutory scheme allows only novel, nonobvious inventions to be patented.

This understanding of “invention” is further reinforced by the Senate Report accompanying the 1952 Patent Act. The Report in discussing §§ 101–103 explains that “A person may have ‘invented’ a machine or a manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.”²⁶⁷ The Report indicates that patentable subject matter, novelty, and obviousness are distinct requirements. The Report does not understand the “invention” to inherently include a notion of creativity, cleverness or nonobviousness. Rather the Report makes clear that inventions can be obvious: “[a]n invention which has been made, and which is new in the sense that the same thing has not been made before, may still not be patentable if the difference between the new thing and what was known before is not considered sufficiently great to warrant a patent.”²⁶⁸ Such usage by the drafters of the 1952 Act make clear that the Act

265. *Id.* § 103.

266. *See* 35 U.S.C. § 102; *see also* Federico, *supra* note 173, at 180 (“The words ‘invent’ and ‘inventor’ as used in sections 101 and 102, as has been stated, do not in themselves import any meaning of novelty, and are used in the sense of ‘is the author of’ and ‘author’ . . .”).

267. S. REP. NO. 82-1979, at 4 (1952).

268. *Id.*

did change the fundamental meaning and usage of the “invention.” This change was for “simplification and clarification of language and arrangement.”²⁶⁹ The Act removed concerns over creativeness and obviousness from the “invention” and it moved those concerns wholly to § 103. And it did so without changing the general level of patentability by returning patent law to the standard “originally expressed in *Hotchkiss*.”²⁷⁰ Nonetheless those clarifying changes in turn have a significant impact on what cases still have relevance for interpreting differing parts of the statute.

The 1952 Patent Act removed the requirement of invention from “invented and discovered” in § 101 and moved it exclusively to § 103. This changed that meaning of “invents” for patent law. Cases like *Funk* are just not good precedent for interpreting the modern requirement’s “invents or discovers” language because that language has changed meaning.²⁷¹ Where the Court continues to rely *Mayo* on *Funk* to require “inventive application” § 101, the Court is making an error of statutory interpretation.²⁷² For understanding today’s § 101, the way forward is clear: don’t cite *Funk*.

VI. THE FUTURE OF § 101 & FRANKFURTER’S CONCURRENCE

The bulk of this article is devoted to arguing that the Court has made an error in its reliance on *Funk*. But this section argues the Court isn’t wholly to blame. The alternative understandings of § 101 that had been offered were just unacceptable to the Court. The Court seems adamant that § 101 must do some substantive work. It cannot be a toothless standard that allows § 101 to become “a dead letter”²⁷³ that could easily be subverted by a clever patent “draftsman.”²⁷⁴ Rather than addressing these worries, the alternative understandings for § 101 may have only entrenched them.

This section concludes with a proposal for a balanced approach to § 101 that correctly interprets the requirement that the patentee “invents” by giving the requirement some real substantive bite but does not reintroduce the requirement of invention. Interestingly this proposal isn’t anything new and radical. This middle path can be found in *Funk* itself (but just not in the majority opinion). Concerned with the majority’s dangerously expansive reasoning, Justice

269. *Id.*

270. *Graham v. John Deere*, 383 U.S. 1, 15 (1966)

271. See Oskar Liivak, *Rescuing the Invention from the Cult of the Claim*, 42 SETON HALL L. REV. 1, 44–47 (2012) (describing the impact of this same terminological confusion for claim interpretation).

272. Of course, the first part of *Funk*’s analysis *does not* deal with the requirement of “invention.” Rather it simply questions whether an invention (in the concrete sense) has been made. There is nothing problematic about citing that section. Certainly, as before *Funk* and as after, patent can issue only for applications of laws of nature rather than for the law of nature itself. Citing those portions of *Funk* (as the Court did in *Benson*) is not problematic.

273. *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 89 (2012).

274. *Id.* at 72.

Frankfurter penned an important concurrence in *Funk* that provides a promising start towards a rational post-*Funk* future.²⁷⁵

A. *Going Too Far: Reading “Invents” Out of § 101*

It is hard to find a more vocal and influential critic of *Funk* than Judge Giles Rich. He provided the blistering criticism of the Solicitor General’s brief in *Flook* and was one of the principal drafters of the 1952 Patent Act. For him, the primary purpose of the 1952 Act was to clarify patent law by introducing the obviousness requirement. His ire toward the requirement of invention was so severe that later when discussing the topic, he quipped, “[p]erhaps it would be appropriate to open this meeting [about § 103] with prayers and a burnt offering. An appropriate burnt offering would be all of the textbooks on patent law which talk about the requirement of ‘invention.’”²⁷⁶ Yet in this zeal to rid patent law of the requirement of invention and to push back against the modern use of *Funk*, what was offered as an alternative vision for modern § 101? Was it a vision the Court (in *Flook* or *Mayo*) could plausibly have adopted instead? This section argues that the alternative theories of § 101 that were offered were so hollowed out that it was wholly unacceptable to the Court even if the Court had gained some sympathy for the idea that *Funk* and an “inventive application” should no longer play a role in modern § 101.

Judge Rich’s alternate view can already be seen in his remarks in *Bergy*. There Judge Rich declares

there has not been a requirement for ‘invention’ in the patentability sense in the laws since 1952—the requirement was replaced by the § 103 requirement for nonobviousness. Furthermore, when one has only compliance with § 101 to consider, the sole question, aside from utility, is whether the invention falls into a named category, not whether it is patentable.²⁷⁷

His statement is telling. In his view, the “sole question aside from utility” for § 101 is whether the thing patented falls into the four statutory categories (“process, machine, manufacture, or composition of matter”).²⁷⁸ Yet that conclusion seems dubious. Does the “invents or discovers” language do any work? And it seems just wrong that invention has been entirely removed from § 101.

After all, prior to 1952 the requirement that the patentee “invents” held a lot of content. For sure a significant part of that content was shipped off to § 103 but it can’t be right that “invents or discovers” doesn’t do any work anymore. It

275. Others have also pointed to the value of Justice Frankfurter’s concurrence. See Ted Sichelman, *Funk Forward* in *INTELLECTUAL PROPERTY AT THE EDGE: THE CONTESTED CONTOURS OF IP* (Rochelle Dreyfuss, Jane Ginsburg & Carol Rose eds., 2013).

276. Giles S. Rich, *Why and How Section 103 Came to Be*, 14 *FED. CIR. B.J.* 181, 181 (2004).

277. *In re Bergy*, 596 F.2d 952, 962 (C.C.P.A. 1979).

278. 35 U.S.C. § 101.

is unclear why Judge Rich opposed any exploration of invents or invention in the modern act. Perhaps the shadow of the requirement of invention was so long enduring that Judge Rich felt the need to drop any discussion of the term even if removed from the requirement of invention. This seems like zeal gone too far.

Recall from the above discussion that even prior to 1952, treatises like WALKER ON PATENTS divided their exploration of the “invention” into two distinct discussions. One was tied to the invention as an application of a law of nature while the other was tied to the requirement of invention.²⁷⁹ It seems quite plausible (and as argued below even quite sensible) that the 1952 Act retained the former while jettisoning the latter for modern § 101.

Nonetheless for whatever reason, Judge Rich kept emphasizing a view of § 101 that gave nearly no substantive weight to the requirement that the patentee “invents.” For example, while again discussing the impact of the 1952 Patent Act he recalled that he “sometimes remind[s] attorneys arguing cases, ‘There is always an *invention*. What we are considering is its *patentability*.’”²⁸⁰ And in a separate article he noted “[t]he thought was to stop talking about whether a thing is or is not an ‘invention,’ to take anything presented as an invention, and then to determine its patentability according to a standard which Congress was to declare”²⁸¹

Those views, if taken literally, suggest that § 101’s requirement that the applicant “invents” does no substantive work. And the toothless vision for § 101 may well have been unacceptable to the Court. In *Flook* and later in *Mayo* the Court has repeatedly raised an important concern regarding § 101. Justice Stevens in *Flook* was adamant that § 101 could not be allowed to be subverted by clever patent attorneys. He warned that the long-standing prohibitions on patenting laws of nature could be circumvented because

[a] competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques. The concept of patentable subject matter under § 101 is not “like a nose of wax which may be turned and twisted in any direction”²⁸²

And more recently Justice Breyer resurrected these worries in *Mayo* noting that the Court’s earlier cases “warn us against interpreting patent statutes in ways

279. See *supra* notes 66-74, 80-83 and accompanying text.

280. Giles S. Rich, *Laying the Ghost of the Invention Requirement*, 14 FED. CIR. B.J. 163, 173 (2005) (emphasis in original).

281. Giles S. Rich, *The Vague Concept of Invention as Replaced by 103 of the 1952 Patent Act*, 14 FED. CIR. B.J. 147, 156 (2005).

282. *Parker v. Flook*, 437 U.S. 584, 590 (1978) (quoting *White v. Dunbar*, 119 U. S. 47, 51 (1886)).

that make patent eligibility “depend simply on the draftsman’s art.”²⁸³ Judge Rich’s views do little to assuage a Court that is concerned with the “antlike persistency of [patent] solicitors.”²⁸⁴

In fact, rather than addressing these worries, this view instead enflames them. Courts were instructed that “every issued patent was to be regarded as disclosing an invention, limiting judicial inquiry to determination of the patentability of that invention.”²⁸⁵ This assumes away inquiry into whether an invention was created or not. In *Mayo*, the petitioner emphasized the toothless nature of this standard. Their reply brief argued that “[t]he government’s proposal [would] reduce Section 101 to a rubber stamp that is easily satisfied with clever drafting.”²⁸⁶ And in a nod to Justice Breyer’s opinion in *LabCorp*, the petitioners argued that “[u]nless Section 101 bars the drafter’s trick of embedding a natural phenomenon in token steps that do nothing to narrow the range of preemption, all the ill effects that Justice Breyer identified in *LabCorp* are certain to occur.”²⁸⁷

When the Court issued its opinion in *Mayo*, it became clear that these worries weighed heavily on the Court. The Court noted that “the Court’s precedents . . . warn us against interpreting patent statutes in ways that make patent eligibility ‘depend simply on the draftsman’s art.’”²⁸⁸ The Court could just not accept that view of § 101, as “[t]his approach, however, would make the ‘law of nature’ exception to § 101 patentability a dead letter.”²⁸⁹

About a decade ago, patent scholarship began criticizing Judge Rich’s views and the patent bar orthodoxy that grew up around it for reasons other than the problems they create for § 101. Those critiques were instead focused on the harm that this orthodoxy had done to § 112, the written description requirement and to claim interpretation generally.²⁹⁰ A central thrust of that critique was a resurrection of a substantive notion of the “invention.” That scholarship was not reintroducing in any way a “requirement of invention” but rather it was focused on what the inventor had actually conceived and disclosed. The patent drafter could certainly document and describe the invention in the patent document but patent attorneys should not be able to create an invention by clever drafting when no invention was actually created.

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

284. *Lyon v. Boh*, 1 F.2d 48, 50 (S.D.N.Y. 1924).

285. Herbert Mintz & Charles L. O’Rourke, *After Black Rock: New Tests of Patentability—The Old Tests of Invention*, 39 GEO. WASH. L. REV. 123, 137 (1970).

286. Reply Brief for Petitioners, *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012) (No. 10-1150), 2011 WL 5562514, at *6.

287. *Id.* at *2.

288. *Mayo Collaborative Servs.*, 566 U.S. at 72.

289. *Id.* at 89.

290. See Oskar Liivak, *Rescuing the Invention from the Cult of the Claim*, 42 SETON HALL L. REV. 1, 24 (2012); Christopher A. Cotropia, *What is the “Invention”?*, 53 WM. & MARY L. REV. 1855, 1911 (2012).

This article argues that § 101 should also be added to that list of areas where a hollowed-out view of the “invention” has been causing mischief. The impoverished view of invention and the resulting narrow understanding of § 101 espoused by Judge Rich, where compliance with the requirement that the applicant “invents” is entirely put into the hand of the clever patent draftsman, is just a non-starter for the Court. The invention is something that must have an existence apart from how it is claimed in the patent documents. As with the course corrections to claim construction and written description, a more substantive notion of the invention, focusing on the actual technical solution that was conceived by the inventor and disclosed in the patent should be the start of an understanding of § 101. Such an understanding not only avoids the errors introduced by *Funk* and *Mayo* but it also leaves behind a substantive standard for § 101 that cannot be easily just drafted around by patent attorneys.

B. *The Invention & Justice Frankfurter’s Concurrence*

A substantive understanding of the “invention” can be found even when care must be taken to avoid re-incorporating the requirement of invention. The core notion of the invention has always centered on the notion of a specific means for achieving some useful ends. The invention is the inventor’s own specific way of solving some relevant problem. It is the “means he specifies to produce the result or effect he describes, and nothing more.”²⁹¹

In focusing on the invention and this idea of means, the courts have turned to the notion of conception.²⁹² Conception “is the ‘formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.’”²⁹³ Importantly, discussion of conception also emphasizes the critically important divide between the means conceived by the inventor versus the ends that the means aims to produce cautioning that “[i]t is not sufficient that the result to be obtained be conceived, but it is required that there be conceived and disclosed the means provided to accomplish that result.”²⁹⁴

And there is a way to start down that road while not wholly abandoning *Funk*. Luckily, there is one judge who noticed this issue and provided an alternate understanding of the whole case. In *Funk*, Justice Frankfurter concurred in the judgment of the Court.²⁹⁵ He concurred in the conclusion that Bond’s patent claim was invalid.²⁹⁶ But he did not rely on Justice Douglas’s broad

291. O’Reilly v. Morse, 56 U.S. 62, 119 (1854).

292. *Id.* at 68 (noting that to “ascertain and settle, what is the thing which was invented,” the Court instructed that “to this end it will be most convenient to begin at its conception”).

293. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376 (Fed. Cir. 1986) (quoting 1 WILLIAM C. ROBINSON, THE LAW OF PATENTS 532 (1890)).

294. Field v. Knowles, 183 F.2d 593, 691 (C.C.P.A. 1950).

295. Funk Brothers Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 132 (1948) (Frankfurter, J., concurring).

296. *Id.* at 135.

pronouncement about what Bond invented and nor did he even find that Bond's work failed the requirement of "invention."

Instead, Justice Frankfurter read the patent carefully and came to the conclusion that Bond did not in fact disclose an invention in his patent. Importantly, this rationale is still valid under § 101 today. The text of § 101 allows patents for any applicant who "invents," and Frankfurter rightfully understood that Bond had not disclosed an invention in his application.

Reading the Supreme Court's majority opinion in *Funk* seems to give a straightforward description of what Bond created and disclosed in his patent. Justice Douglas first reviewed Bond's key discovery that "there are strains of each species of root-nodule bacteria which do not exert a mutually inhibitive effect on each other. [Bond] also ascertained that those mutually non-inhibitive strains can by certain methods of selection and testing, be isolated and used in mixed cultures."²⁹⁷ This summary is correct and helpful. But then Justice Douglas goes on to make a critical misstep.²⁹⁸ He states that Bond

provided a mixed culture of Rhizobia capable of inoculating the seeds of plants belonging to several cross-inoculation groups. It is the product claims which disclose that mixed culture that the Circuit Court of Appeals has held valid. We do not have presented the question whether the methods of selecting and testing the non-inhibitive strains are patentable. We have here only product claims.²⁹⁹

The trouble is Bond never actually described a successful mixed culture. He certainly claims them using entirely functional language. Bond certainly talks about the *objective* of providing a universal inoculant that is non-inhibitive and though he talks about a methodology by which such non-inhibiting strains could be identified, the patent never discloses which particular combination of strains actually are non-inhibitive. There is no deposit of a non-inhibitive mixture nor is there any way to identify non-inhibitive strains other than simply redoing the experiments and identifying non-inhibitive strains ourselves. Justice Douglas and the majority opinion in *Funk* misunderstood that no actual invention was disclosed.

Justice Frankfurter did not make this mistake. In his concurrence, Justice Frankfurter made clear that "a particular mixture of compatible strains is an invention and as such patentable,"³⁰⁰ but reading the patent Justice Frankfurter found that Bond never actually disclosed a particular mixture. Instead, he found that "[t]he strains by which Bond secured compatibility are not identified and

297. *Id.* at 130.

298. Though perhaps it is unfair to lay blame for misreading the patent entirely with Justice Douglas. The appellate court appears to have portrayed the patent exactly as had Justice Douglas. The difference is that the appellate court would have found such an invention patentable.

299. *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

300. *Funk Bros. Seed Co.*, 333 U.S. at 133 (Frankfurter, J., concurring).

are identifiable only by their compatibility,”³⁰¹ and as result held “Bond’s patent invalid.”³⁰²

In short, Bond describes his mixture only by its function; it is described as the mixture of strains that do not inhibit. But the identity of even one combination of strains is never disclosed in the rest of the patent specification. Justice Frankfurter looks carefully at the patent and finds that Bond has not invented anything because he never discloses the actual strains that lead to compatibility. This is of particular importance today as overbroad functional claiming has been an issue related to patentable subject matter. And most importantly, if indeed the modern Court is more concerned about the clever draftsman’s ability to circumvent patent limits, then the Court should follow Frankfurter’s lead and should similarly require that the patent actually disclose an invention rather than just use functional claims that effectively claim vast swaths but do not themselves disclose.³⁰³

Furthermore, Frankfurter provides extremely prescient warnings about the dangers in the reasoning adopted by the majority. First, he warns that the language employed by the majority can be too easily manipulated. Though protection of a robust public domain and its “storehouse of knowledge” is surely right, the language employed by the majority could too easily be used to strike down all manner of beneficial inventions.³⁰⁴ Frankfurter notes that:

It only confuses the issue, however, to introduce such terms as “the work of nature” and the “laws of nature.” For these are vague and malleable terms infected with too much ambiguity and equivocation. Everything that happens may be deemed “the work of nature,” and any patentable composite exemplifies in its properties “the laws of nature.” Arguments drawn from such terms for ascertaining patentability could fairly be employed to challenge almost every patent.³⁰⁵

There is a lot to praise in Frankfurter’s views. He cautions that the broad language of the majority opinion could all too easily apply to almost any invention. In fact, he specifically discusses the example of a new alloy that may well have exceedingly desirable properties but, under the reasoning of the majority, the alloy may well not be eligible for a patent.³⁰⁶

Further, and more importantly for this article, Frankfurter provides a way out for the current mess. His rationale, as opposed to the majority’s reasoning, falls squarely in conventional patentable subject matter analysis. In fact, it is closely

301. *Id.* at 133.

302. *Id.* at 135.

303. See Oskar Liivak, *Overclaiming is Criminal*, 49 AZ. ST. L. J. 1417, 1434 (2017) (discussing the problems with unregulated use of functional claiming).

304. *Funk Bros. Seed Co.*, 333 U.S. at 135.

305. *Funk Bros. Seed Co.*, 333 U.S. at 134–35.

306. *Id.* at 134.

related to the discussion in *O'Reilly v. Morse* and other foundational cases.³⁰⁷ In addition, Frankfurter correctly understood that Bond had failed to disclose an invention in his application and that at best he was broadly trying to claim that subject matter using functional language. Importantly, that understanding would bring *Funk* in line with modern § 101 and within the modern understanding of what it means to “invent.” And it leads to a vision for § 101 that is not toothless.

VII. CONCLUSION

Patentable subject matter is a difficult and contentious issue. But patent law's reliance on *Funk Bros. Seed Co. v. Kalo Inoculant Co.* has just added to the difficulties. Its current prominence in modern patentable subject matter is just an error. Though the Court in *Funk* was ostensibly interpreting what it means to “invent,” *Funk* cannot be used for interpreting that language after the 1952 Patent Act. By its structure and purpose, the Act changed the meaning of the invention and what it means to “invent.” Previously, the invention inherently incorporated the quality that we today call non-obviousness. The modern usage of the invention in the U.S patent system has stripped concerns about obviousness from the definition of the invention.

Instead, patentable subject matter should only ask whether the patentee has in fact conceived a specific means for accomplishing some useful ends. The inventor's specific means is the invention. Prohibiting patents claiming “laws of nature, physical phenomena, and abstract ideas” is not some extra-statutory policy gloss. It is the natural outgrowth of requiring that as a threshold matter every patentee must invent before arriving at the Patent Office. As made clear in Justice Frankfurter's concurrence in *Funk* this understanding of the invention is not toothless at all. It would have reached the same result as the majority in *Funk*, but it would have done so without, as presciently lamented by Justice Frankfurter, a rule that “would lay the basis for denying patentability to a large area within existing patent legislation.”³⁰⁸ That is the rule for § 101 that we need to get back to.

307. PETER MENELL ET AL., I INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE: 2020 at 280 (“Justice Frankfurter offered an alternate basis for invalidation reminiscent of the *Morse* decision”).

308. *Funk Bros. Seed Co.*, 333 U.S. at 135.