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Written Statement to the U.S. Senate Committee on the Judiciary
Subcommittee on Intellectual Property

The State of Patent Eligibility in America: Part I
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Chairman Tillis, Ranking Member Coons, and distinguished members of the subcommittee,

Thank you for the opportunity to testify on a matter of great importance to the economy: the state of patent eligibility law and its impact on judges and patent examiners as well as inventors, investors, and their attorneys. I look forward to discussing with you ways to reform the law of patent eligibility to provide judges and patent examiners with a coherent approach to the question of patent eligibility. I hope any reform will seek to ensure both predictable and correct outcomes in particular cases; to reinstate the incentive for inventors to invent in the life sciences industries; and to reinvigorate investment in all areas of inventive efforts.

As a preliminary matter, let me highlight that since 2014 I have served as a Member and the Reporter of the Patentable Subject Matter Task Force of the American Intellectual Property Law Association (AIPLA), that in 2017 I (along with Professor Jeff Lefstin of the University of California Hastings and Professor Peter Menell of the University of California Berkeley) convened the Section 101 Workshop at the University of California Berkeley, and that in 2017 I received a research grant funded by Microsoft Corporation to pay expenses associated with one of my research projects related to patent eligibility. I speak today, however, on my own behalf and not as a representative of any other person or organization, including AIPLA, the Section 101 Workshop participants, or Microsoft. Indeed, besides an article jointly authored with Professors Lefstin and Menell reporting on the Section 101 Workshop, I have written five articles on the topic of patent eligibility and a casebook chapter on the topic of patent utility, all of which include my own personal views. *See* Appendix A. I will draw upon all of this scholarship today.

I. The Current State of Patent Eligibility Law

Patent eligibility law is in a state of crisis, and legislative reform is needed to eliminate that crisis. The crisis is one of confusion and incorrect results leading to reduced investment in inventive efforts, most notably in the life sciences industries.

A. Confusion

Confusion exists, first, because the current approach to determining patent eligibility confuses the relevant policy concerns underlying numerous discrete patent law doctrines. Indeed, the Supreme Court's test for eligibility—while derived from its interpretation of 35 U.S.C. § 101 as including several implicit (some would say non-statutory) exceptions—is based on several policy concerns better addressed by other statutory patent law doctrines. In particular, the existing doctrines of non-obviousness, written description, and enablement already address concerns with

the breadth of patent claims.¹ Likewise, the utility, written description, and definiteness requirements, as well as the existing limit on functional claiming, already address concerns with abstractness and inadequate disclosure.² Moreover, concern regarding preemption of the basic building blocks of human ingenuity—the concern primarily emphasized in the most recent Supreme Court case on eligibility³—ignores the utility, enablement, and written description requirements, the limited terms of patents, and the existing experimental use exception.⁴

Confusion also exists because, beyond confusing relevant policies and doctrines, the current approach to determining patent eligibility lacks administrability. It is exceedingly difficult to understand whether a patent examiner or a court should find subject matter eligible for patenting given the overarching test for eligibility articulated by the Supreme Court. That test requires two increasingly confusing analyses. First, the examiner or judge must determine whether a patent claim is directed to an ineligible concept: a law of nature, a physical phenomenon, or an abstract idea.⁵ Second, the examiner or judge must then determine whether something in the claim transforms the nature of the claim into a patent-eligible application of the ineligible concept, an analysis identified as the search for an “inventive concept,” one that “sufficiently ensure[s] that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.”⁶ That two-part test is—to use a term coined by Justice Scalia with respect to his understanding of another patentability test—“gobbledygook.”⁷ Another way of describing it is—this time using a phrase coined by Justice Stewart when describing his understanding of hard-core pornography and thus obscenity—“I know it when I see it.”⁸ In short, the Supreme Court’s test for

¹ See 35 U.S.C. §§ 103(a) (non-obviousness), 112(a) (written description and enablement) (2012).

² See 35 U.S.C. §§ 101 (utility), 112(a) (enablement and written description); 112(b) (definiteness), 112(f) (limitation on functional claiming) (2012).

³ See *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014) (“We have described the concern that drives this exclusionary principle as one of pre-emption.”).

⁴ See 35 U.S.C. §§ 101 (utility), 112(a) (enablement and written description), 154(a)(2) (limited term), 271(e)(1) (experimental use exception) (2012); e.g., Ted Hagelin, *The Experimental Use Exemption to Patent Infringement: Information on Ice, Competition on Hold*, 58 FLA. L. REV. 483, 560 (2006) (describing the existing, narrow statutory experimental use exception and advocating for a more robust statutory experimental use exception in part to “avoid inefficient barriers to follow-on and downstream research efforts”). Additionally, this concern could be addressed directly by a more robust experimental use exception to infringement liability. See Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1086 (1989) (advocating for “a carefully formulated experimental use exemption from patent infringement liability”). In the recent Supreme Court eligibility cases, of course, the questions presented have not expressly identified these other patent law doctrines, and the Court has not analyzed most of these doctrines despite their clear relevance to the Court’s policy concerns. At most, in *Mayo* the Court summarily dispensed with the idea that the other patentability requirements sufficiently address those concerns. See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1304 (2012) (“We recognize that, in evaluating the significance of additional steps, the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap. But that need not always be so. And to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do.”). Dmitry Karshedt has similarly argued that the courts have created a de facto *extra-statutory* condition of patentability he calls the “completeness” requirement. See generally Dmitry Karshedt, *The Completeness Requirement in Patent Law*, 56 B.C. L. Rev. 949 (2015).

⁵ *Alice*, 134 S. Ct. at 2355.

⁶ *Id.* (citing *Mayo*, 132 S. Ct. at 1294).

⁷ Transcript of Oral Argument at 41, *KSR v. Teleflex*, 550 U.S. 398 (2007) (No. 04-1350) (criticizing the Federal Circuit’s teaching, suggestion, or motivation to combine test as “gobbledygook”).

⁸ *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring). At least one district judge has leveled this criticism of the *Mayo* two-step test for eligibility in several opinions. See, e.g., *McRO, Inc. v. Sony Computer Entm’t Am., LLC*, 55 F. Supp. 3d 1214, 1220 (C.D. Cal. 2014) (noting that “the two-step test may be more like a one step test evocative of Justice Stewart’s most famous phrase”).

eligibility provides no objective guidelines. There are no objective guidelines, in particular, to help a patent examiner or judge determine what constitutes an abstract idea or an inventive concept.⁹

This confusion is widely recognized and lamented. The Section 101 Workshop revealed a broad consensus about this confusion. As explained in the report on the Section 101 Workshop, “there was consensus that a test requiring a search for an ‘inventive’ application of a natural law or physical phenomenon does not provide adequate objective guidance to patent examiners, jurists, practitioners, or the inventive community.”¹⁰ Indeed, “[a]s one participant explained, the current state of affairs is ‘awful’ because investors look for patents, which are critical to their investment decisions. And yet under the current law, patent lawyers cannot provide clear or reliable guidance about eligibility.”¹¹ Likewise in our report on the Section 101 Workshop we explained that “[m]any participants viewed patent eligibility doctrine as incoherent. It lacks the clarity needed for a property-based incentive regime to function effectively. The lack of clarity has led the [U.S. Patent and Trademark Office (“USPTO”)] to restrict patent eligibility even beyond what some participants believe the case law requires.”¹² Unfortunately this confusion has not abated.

B. Incorrect Results

Ironically, while the underlying policy concerns have been confused and the proper analysis of patent eligibility under the Supreme Court’s recent precedent is confusing, the result of all this confusion is seemingly clear. The result seems to be that, when challenged, patent applications and issued patents, at least in certain technology areas,¹³ probably do not satisfy the requirement of eligibility. Regardless of whatever analysis the “gobbledygook” test actually requires, it gives unfettered access to the smorgasbord of supporting policies justifying different limits on patentability and is unconstrained and subjective by nature. In reality we are not quite to the point where we could say, as Justice Jackson quipped in the context of U.S. patent law’s discarded “invention” requirement—which, also ironically, the Supreme Court effectively resurrected in its search for an “inventive concept”—that “the only patent that is valid is one which [the Supreme] Court has not been able to get its hands on.”¹⁴ After all, the Supreme Court did find for the patent owner on the issue of eligibility, at least in part, in one of the four cases on point it heard between 2010 and 2014.¹⁵ Application of the Supreme Court’s eligibility test by the lower

⁹ For a thorough treatment of the ambiguity of the prohibition on patenting an abstract idea, see generally Kevin Emerson Collins, *Bilski and the Ambiguity of “an Unpatentable Abstract Idea,”* 15 LEWIS & CLARK L. REV. 37 (2011).

¹⁰ Jeffrey A. Lefstin, Peter S. Menell, & David O. Taylor, *Final Report of the Berkeley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenges*, 33 BERKELEY TECH. L.J. 555, 597 (2018).

¹¹ *Id.*

¹² *Id.*

¹³ These concerns particularly plague biotechnology and software technologies, but the impact of the Supreme Court’s precedent has affected various other types of technologies. *See, e.g.*, *Thales Visionix, Inc. v. United States*, 122 Fed. Cl. 245 (2015) (invalidating claims to “motion-tracking technology for defense and aerospace applications” based on the Supreme Court’s two-part test), *rev’d and remanded*, 850 F.3d 1343 (Fed. Cir. 2017).

¹⁴ *Jungerson v. Ostby & Barton Co.*, 335 U.S. 560, 572 (1949) (Jackson, J., dissenting). The analogy to *Jungerson* is particularly apt given the return of the concept of “invention” in the form of the search for an inventive concept. *Compare id.* (complaining that the Supreme Court seemingly invalidated every patent based on the “invention” requirement) *with Alice*, 134 S. Ct. at 2355 (explaining the requirement to search for an inventive concept).

¹⁵ In the one case where the Court found for the patent owner on the issue of eligibility, the Court actually split the baby by finding for the patent owner on one set of claims, and for the challenger on another set of claims. *Compare* *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) (finding eligibility of one of two sets of claims) *with Bilski*, 561 U.S. at 593 (finding ineligibility of all claims); *Mayo*, 132 S. Ct. at 1289 (same); *Alice*, 134 S. Ct. at 2347 (same).

courts, however, has been more stark. In the first year after the Supreme Court’s last decision on patent eligibility, for example, the U.S. Court of Appeals for the Federal Circuit invalidated every patent claim challenged as ineligible in twelve of thirteen opinions on point.¹⁶

While I am not taking a position with respect to the eligibility of the underlying patents in each of the cases decided under the current “inventive concept” legal regime—although I do recognize that many cases would likely reach the same result under a better legal regime—the confusing state of patent eligibility law has, unquestionably in my mind, resulted in incorrect determinations of ineligibility in particular cases. Indeed, judges have spoken loudly about the inventive concept requirement causing incorrect results, particularly in the context of life sciences. They have identified problems with it, suggested solutions, and recently even indicated they believe legislative reform is necessary. Judge Richard Linn, for example, highlighted problems with the inventive concept requirement in *Ariosa v. Sequenom*, a case decided by the Federal Circuit in 2015.¹⁷ That case involved a patent on an invention allowing for non-invasive detection of birth defects.¹⁸ Despite the novelty of the discovery involved and the patent claiming its practical use to detect birth defects, the court invalidated the patent based on the lack of an inventive concept distinguishing the invention from a conventional use of a physical phenomenon or natural law.¹⁹ Calling attention to the inventive concept requirement, Judge Linn explained that its breadth “was unnecessary to the decision reached in *Mayo*” and, moreover, lamented that the “case represent[ed] the consequence—perhaps unintended—of [the] broad language [of the inventive concept requirement] in excluding a meritorious invention from the patent protection it deserves and should have been entitled to retain.”²⁰ He went on to say that he saw “no reason, in policy or statute, why [Sequenom’s] breakthrough invention should be deemed patent ineligible.”²¹

While the en banc Federal Circuit denied rehearing in *Ariosa*, several judges noted they were disturbed by the result. Judge Alan Lourie and Kimberley Moore, for example, explained that “it is unsound to have a rule that takes inventions of this nature out of the realm of patent-eligibility on grounds that they only claim a natural phenomenon plus conventional steps, or that they claim abstract concepts.”²² Judge Timothy Dyk too wrote an opinion highlighting his view of the problem with the inventive concept requirement: As he saw it, “there is a problem

¹⁶ The opinions reporting holdings of ineligibility include *Versata Development Group, Inc. v. SAP America, Inc.*, 793 F.3d 1306 (Fed. Cir. 2015); *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363 (Fed. Cir. 2015); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343 (Fed. Cir. 2015); *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015); *Allvoice Developments US, LLC v. Microsoft Corp.*, 612 Fed. Appx. 1009 (2015); *Content Extraction and Transmission LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343 (Fed. Cir. 2014); *Univ. of Utah Research Found. v. Ambray Genetics Corp.*, 774 F.3d 755 (Fed. Cir. 2014); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014); *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350 (Fed. Cir. 2014); *Planet Bingo, LLC v. VKGS LLC*, 576 Fed. Appx. 1005 (Fed. Cir. 2014); *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014). The lone exception is *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). Note that the list of cases does not include other cases during the same year when the Federal Circuit affirmed ineligibility holdings without issuing opinions. See *Dietgoal Innovations LLC v. Bravo Media LLC*, 599 Fed. Appx. 956 (Fed. Cir. 2015); *Gametek LLC v. Zynga Inc.*, 597 Fed. Appx. 644 (Fed. Cir. 2015); *Fuzzysharp Technologies Inc. v. Intel Corporation*, 595 Fed. Appx. 996 (Fed. Cir. 2015); *Fed. Home Loan Mortg. Corp. v. Graff/Ross Holdings, LLP*, 604 F. App’x 930 (Fed. Cir. 2015).

¹⁷ *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1380-81 (Fed. Cir. 2015) (Linn, J., concurring).

¹⁸ *Id.* at 1373.

¹⁹ *Id.* at 1376-77.

²⁰ *Id.* at 1380 (Linn, J., concurring).

²¹ *Id.* at 1381 (Linn, J., concurring).

²² *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 809 F.3d 1282, 1287 (Fed. Cir. 2015) (Lourie, J., concurring in the denial of the petition for rehearing en banc).

with *Mayo* insofar as it concludes that inventive concept cannot come from discovering something new in nature—*e.g.*, identification of a previously unknown natural relationship or property.”²³ Judge Dyk went so far as to propose a solution to the problem, “limiting the scope of patents based on new discoveries to narrow claims covering applications actually reduced to practice,” in other words actually built.²⁴

The participants in Section 101 Workshop likewise converged upon the idea that with respect to software patent eligibility the main problem is confusion, but with respect to bioscience the main problem is incorrect results. As we summarized in our report,

[p]atent prosecutors and examiners do not know what to do when confronted with a question of software eligibility. In the words of one participant, prosecutors in particular are “pulling their hair out.” By contrast, bioscience research representatives and many legal scholars worry that the Supreme Court’s standards relating to breakthrough scientific advances are far too clear and clearly wrong.²⁵

C. Reduced Investment

Given the confusion and incorrect results, a resulting concern is that the current environment substantially reduces incentives to invest in research and development; if the prevailing perception is that, because of the eligibility requirement, patents may not or will not be available to protect inventions, individuals and companies may not invest efficiently in research and development in affected technology areas. This concern has proven to be well grounded.

I conducted a survey that provides data showing reduced investment generally, but in particular in life sciences, following the Supreme Court’s four recent cases establishing the current patent eligibility test.

I began this project seeking to answer the following questions: To what extent have the Supreme Court’s cases shifting eligibility law actually impacted decisions to invest in the development of technology? Moreover, exactly how have these cases actually impacted investment decisions? And to the extent these cases have had a significant impact on investment decisions, has that impact proven to be positive or negative in the sense of increased or decreased investment? Existing literature provided surprisingly little data even to begin to answer these questions. Indeed, I was unable to identify any survey asking investors to identify how changes to patent eligibility law impacted their investment decisions. And, make no mistake, these questions are fundamental, and the accuracy of their answers is important. Answers to these questions, for example, would either support congressional intervention in the law of patent eligibility or counsel against it. Thus, I sought to answer these questions by reference to hard data rather than gut feeling or prognostication.²⁶ And so that is exactly what I did: I gathered data to help begin the process of

²³ *Id.* at 1289 (Dyk, J., concurring in the denial of the petition for rehearing en banc).

²⁴ *Id.* at 1292 (Dyk, J., concurring in the denial of the petition for rehearing en banc).

²⁵ Jeffrey A. Lefstin, Peter S. Menell, & David O. Taylor, *Final Report of the Berkeley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenges*, 33 BERKELEY TECH. L.J. 555, 593 (2018).

²⁶ *Cf.* Mark A. Lemley, *Faith-Based Intellectual Property*, 62 UCLA L. REV. 1328, 1329 (2015) (lamenting that “[p]articipants on both sides of the IP debates are increasingly staking out positions that simply do not depend on evidence at all”).

identifying accurate answers to these questions about the Supreme Court's impact on decisions to invest in the development of technology. In particular, I conducted a survey of 475 venture capital and private equity investors to study the impact of the Court's eligibility cases on their firms' decisions to invest in companies developing technology. This survey was the first of its kind, and the data it provided was sorely needed.

The results of the survey provide critical insights into the impact of the Supreme Court's eligibility cases. I identified four principal findings. The first relates to the absolute and relative importance of patent eligibility with respect to investor decisionmaking. The second correlates reduced eligibility with particular investment behaviors in particular industries. The third provides more specific insight into the potential causal connection between the Supreme Court's eligibility cases and particular changes in investment behavior. And the fourth identifies a correlation between investors' knowledge regarding the Court's eligibility cases (what I refer to as eligibility knowledge) and changes in investment behavior.

Regarding the first principal finding, the investors who responded to the survey overwhelmingly believe patent eligibility is an important consideration when their firms decide whether to invest in companies developing technology. Indeed, overall 74% of the investors agreed that patent eligibility is an important consideration in firm decisions whether to invest in companies developing technology; only 14% disagreed. Likewise, investors reported that reduced patent eligibility for a technology makes it less likely that their firm will invest in companies developing that technology. For example, overall 62% of the investors agreed that their firms were less likely to invest in a company developing technology if patent eligibility makes patents unavailable, while only 20% disagreed. These results, while perhaps not surprising, nonetheless confirm one of the central premises upon which the patent system rests: that patents help to spur investment in development of technology. The availability of patents, however, was not the most important consideration to the investors. The quality of a target company's people ranked as most important, followed by the quality of the company's technology and the size of the potential market for the technology. By one metric, investors deemed the availability of U.S. patent protection to be only slightly less important than first mover advantage; by another metric, it was deemed slightly more important. Thus, the first principal finding is that patent eligibility is an important factor—albeit certainly not the most important factor—in investment decisions.

The second principal finding is that reduced patent eligibility correlates with particular investment behaviors in particular industries. Investors overwhelmingly indicated, for example, that the elimination of patents would either not impact their firm's decisions whether to invest in companies or only slightly decrease investments in companies developing technology in the construction (89%), software and Internet (80%), transportation (84%), energy (79%), and computer and electronic hardware (72%) industries. But investors, by contrast, overwhelmingly indicated that the elimination of patents would either somewhat decrease or strongly decrease their firm's investments in the biotechnology (77%), medical device (79%), and pharmaceutical industries (73%). Thus, according to these investors, on average each industry would see reduced investment, but the impact on particular industries would be different. And the life sciences industries are the ones most negatively affected.

The third principal finding is that the Supreme Court's eligibility cases have impacted many firms' investments and, more significantly going forward, their firm's investment behaviors. Almost 40% of the investors who knew about at least one of the Court's eligibility cases indicated that the Court's decisions had somewhat negative or very negative effects on their firm's existing investments, while only about 15% of these investors reported somewhat positive or very positive effects. On a going forward basis, moreover, almost 33% of the investors who knew about at least one of the Court's eligibility cases indicated that these cases affected their firms' decisions whether to invest in companies developing technology. These investors reported primarily decreased investments, but also shifting of investments between industries. In particular they identified shifting of investments out of the biotechnology, medical device, pharmaceutical, and software and Internet industries.

The fourth principal finding is that investors familiar with the Supreme Court's eligibility cases indicated different changes in firm investment behavior as compared to investors without this familiarity. As discussed above, about 33% of investors with this familiarity reported that these cases impacted their firms' investment behavior, with these investors reporting shifting of investments away from the software and Internet industry along with the biotechnology, medical device, and pharmaceutical industries. Investors without familiarity with these cases, by contrast, overwhelmingly reported that the decreased availability of patents since 2009 (prior to the Supreme Court's recent eligibility cases) has not impacted their firms' changes in investment behavior. Indeed, a full 95% indicated no impact on any change in their firm's investments. Moreover, investors without familiarity with these cases indicated more often, as compared to investors with familiarity, that their firms have shifted investments into the software and Internet industries as compared to all other industries. In short, eligibility knowledgeable investors report the Supreme Court's cases have resulted in reduced investment in software and the Internet, while unknowledgeable investors report increased investment in software and the Internet over the same time period. As investors transition from non-knowledgeable to knowledgeable (once they learn about the Court's cases and their impact on patent eligibility), investment in software and the Internet will seemingly decrease.

The results of the survey provide critical data for an evidence-based evaluation of competing arguments in the ongoing debate about the need for congressional intervention in the law of patent eligibility.²⁷ Proponents of reform may tout the results of the survey as representing a clarion call for reform. The best that can be said by those that prefer the status quo is that most investors do not report changing their investment decisionmaking based upon the Supreme Court's eligibility decisions. A significant part of this group of investors, however, represents those uninformed about the Court's cases. The reality is that the results of the survey highlight the importance of patent eligibility and the negative impact of the Supreme Court's eligibility cases generally on investment, but particularly in the most important areas of technological development in terms of its impact on public health: the biotechnology, medical device, and pharmaceutical industries, which collectively I refer to as the life sciences industries. That said, it is important to highlight that the results show the Court's decisions have negatively impacted each and every area of technological development studied. And, as a consequence, the results do support the idea that

²⁷ See John M. Golden et al., *Steps Toward Evidence-Based IP, The Path of IP Studies: Growth, Diversification, and Hope*, 92 TEX. L. REV. 1757, 1759 (2014) ("IP legal studies have entered a new period of very substantial empirical scholarship, a period that might enable more precise and accurate policy prescriptions than ever before.").

the time has come for Congress to at least consider overturning the Supreme Court’s new eligibility standard to prevent additional lost investment in technological development in the United States.²⁸ Indeed, given the results of the survey, it seems likely that the Supreme Court’s eligibility decisions have resulted in lost investment in the life sciences that has delayed or altogether prevented the development of medicines and medical procedures.

Given the uniqueness and importance of this survey and the resulting data, I have attached a copy of the survey questions and results. *See* Appendix B and Appendix C.

II. Need for Legislative Reform

Given the confusion, lack of administrability, incorrect results, and reduced investment in research and development shown by my survey, in my view the time has come for reform. Before proceeding to analyze the current legislative reform proposal, however, it is important to recognize why it does not make sense to wait for the Supreme Court to reform the law, why it does not make sense to ask inventors and their investors to seek alternative avenues to project their efforts and investments, and why it is appropriate for Congress to be the organ of the federal government to take action to reform the law.

A. The Supreme Court is Unlikely to Solve the Problems with Patent Eligibility Law

Lower courts and the U.S. Patent and Trademark Office are of course bound by the Supreme Court’s current test for patent eligibility, and unfortunately the Supreme Court is unlikely to solve the problems with patent eligibility law.

The Supreme Court is both obsessed with the law governing eligible subject matter and unable to identify a workable standard. Indeed, the Court has paid significant attention to what it refers to as the “implicit exception” to subject-matter eligibility,²⁹ to the relative exclusion of the patentability and specification requirements actually written in the patent statute. And yet all the Court has to show for its efforts is considerable confusion, a test that lacks administrability, incorrect results, and reduced incentive to invent.

Regarding the Supreme Court’s obsession with patent eligibility, simply consider the data. In the five year period between 2010 and 2014, for example, the Court decided four cases on patent eligibility³⁰ and merely one case on any of the matters of utility, novelty, non-obviousness, written description, enablement, definiteness, and experimental use combined.³¹ Moreover, between 1976 and 2016—in other words, in forty years—the Court heard and decided eight cases on subject matter eligibility.³² In the same time period, it decided only four cases addressing other patent doctrines: one

²⁸ *See generally* David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149 (2017) (evaluating various approaches to amending the patent statute).

²⁹ *See Mayo*, 132 S. Ct. at 1293 (“The Court has long held that [35 U.S.C. § 101] contains an important implicit exception. ‘[L]aws of nature, natural phenomena, and abstract ideas’ are not patentable.” (quoting *Diamond v. Diehr*, 450 U.S. 175, 185 (1981))).

³⁰ *See, e.g., Alice*, 134 S. Ct. at 2347; *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013); *Mayo*, 132 S. Ct. at 1289; *Bilski v. Kappos*, 561 U.S. 593 (2010).

³¹ *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (discussing claim definiteness).

³² *See, e.g., Alice*, 134 S. Ct. at 2347; *Ass’n for Molecular Pathology*, 133 S. Ct. at 2107; *Mayo*, 132 S. Ct. at 1289; *Bilski*, 561

on the test applicable under 35 U.S.C. § 102 and one on the test applicable under 35 U.S.C. § 103;³³ two on the statutory experimental use exception;³⁴ and none on the utility, written description, and enablement requirements. Thus, it is quite clear that the Court is obsessed with the non-statutory exceptions to patent eligibility, at least relative to the statutory patentability requirements and other patent law doctrines. Unfortunately, however, it is also quite clear that the Court's decisions in the area of patent eligibility have caused the significant problems discussed above.

Even if one recognizes all of the problems with the Supreme Court's test for eligibility, before reaching the conclusion that Congress should act to correct these problems, one should consider whether the Court itself might reverse course. Indeed, as just shown, the Court is obsessed with the question of patent eligibility, and so it seems likely that the Court would grant certiorari in yet another case on point. But granting review in another case does not necessarily mean that the Court will reverse its precedent. So if the question is whether Congress should wait for the Supreme Court to correct itself, the answer lies in whether there is any reasonable chance that the Court will reverse its recent precedent.³⁵ Unfortunately, it seems unlikely.

In *Alice Corp. v. CLS Bank International*,³⁶ the Court already confronted urgent pleadings to clarify the two-part test it articulated in *Mayo*.³⁷ The petitioner, in particular, asked the Court to reject *Mayo*'s suggestion that it is appropriate to dissect claims to search for an abstract idea given the resulting uncertainty.³⁸ Amici similarly asked the Court to reject, in whole, the two-part test articulated in *Mayo*. As just one example, former Federal Circuit Chief Judge Paul Michel's amicus brief asked the Court to reject or at least clarify statements in *Mayo*, return to the Court's traditional analysis in *Diamond v. Diehr*,³⁹ and spurn any notion of adopting the Court's other approaches in other cases.⁴⁰

In *Alice*, however, the Court doubled down on *Mayo*.⁴¹ The Court adopted *Mayo*'s two-part test as the controlling test for all of the non-statutory exceptions to patent eligibility. The Court

U.S. at 593; *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124 (2001); *Diamond v. Diehr*, 450 U.S. 175 (1981); *Diamond v. Chakrabarty*, 447 U.S. 303 (1980); *Parker v. Flook*, 437 U.S. 584 (1978).

³³ See *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007) (addressing § 103); *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 57 (1998) (addressing § 102).

³⁴ See *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193, 208 (2005); *Eli Lilly & Co. v. Medtronic, Inc.*, 496 U.S. 661, 665 (1990).

³⁵ For example, might the Court finally reach the conclusion that the appropriate approach for patent eligibility is to focus on whether a claimed invention is the result of human effort and a practical application of a natural law, physical phenomena, or abstract idea? See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 212-21 (2017) (discussing these concepts).

³⁶ *Alice*, 134 S. Ct. at 2347.

³⁷ See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012).

³⁸ Brief for Petitioner at 53-54, *Alice Corp.*, 134 S. Ct. 2347 (No. 13-298) ("In particular, lower courts have misinterpreted some of the Court's decisions—particularly *Flook* and *Mayo*—to authorize a dissection of claims to search for an abstract idea, vaguely defined, at their core. Such an approach is not just contrary to this Court's case law and the statutory text. It is entirely unworkable . . . Such uncertainty imposes real costs on courts, litigants, innovators, and the broader economy. . . . Indeed, the costs of the current confusion can be vividly seen in this case.").

³⁹ See *Diamond v. Diehr*, 450 U.S. 175, 191-93 (1981).

⁴⁰ See Brief for Paul R. Michel as Amicus Curiae in Support of Neither Party, *Alice Corp.*, 134 S. Ct. 2347 (No. 13-298) ("Nor should the Court rely on statements in its two recent life-science Section 101 cases *Mayo v. Prometheus* . . . and *Ass'n For Molecular Pathology v. Myriad Genetics, Inc.* . . . beyond those statements' applicable bounds, lest they be applied in a manner that does not fit the realities of computer technology. . . . [T]he Court should return to its seminal precedent in *Diehr*, a computer case, which provides the best approach. Any recourse to the aberrational approach of *Flook* or the unworkable notion of relative abstractness of *Bilski* will complicate, confuse, and confound the patent law." (citations omitted)).

⁴¹ See *Alice*, 134 S. Ct. at 2355.

first described *Mayo* as “set[ting] forth a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.”⁴² The Court then explained each part of the test in detail, quoting and citing *Mayo* without any criticism.⁴³ Only in a footnote did the Court meekly attempt to explain how *Mayo* was consistent with *Diehr*.⁴⁴ In the end, the Court simply applied *Mayo*’s two-part test.⁴⁵

If in a future case the Court were to squarely address calls to reverse its precedent, the Court would no doubt consider the doctrine of *stare decisis* as a ground to continue use of the two-part test, even if that test contradicts the Court’s precedent and, ultimately, is wrong. Moreover, it seems likely that the Court would rely upon *stare decisis* to reject any argument for it to overturn its precedent on § 101.⁴⁶ A recent decision of the Supreme Court in a patent case shows why.

The Supreme Court’s decision in *Kimble v. Marvel Enterprises* provides guidance on the likelihood of its application of *stare decisis* in the context of the law governing patent eligibility.⁴⁷ In the case, the Court considered whether to overturn its precedent holding that it is patent misuse to require payments for a license to a patent where the payments are based on use of the patented technology after the patent has expired.⁴⁸ The Court decided not to overturn its precedent based on the doctrine of *stare decisis*.⁴⁹ It did so despite overwhelming legal and economic literature indicating that its precedent is unequivocally wrong.⁵⁰

The Court began its analysis by highlighting that reversal of its precedent required “a ‘special justification’—over and above the belief ‘that the precedent was wrongly decided.’”⁵¹ “What is more,” noted the Court, “*stare decisis* carries enhanced force when a decision . . . interprets a statute.”⁵² The Court explained that it would

apply statutory *stare decisis* even when a decision has announced a “judicially created doctrine” designed to implement a federal statute. All our interpretive decisions, in whatever way reasoned, effectively become part of the statutory scheme, subject (just like the rest) to congressional change. Absent special justification, they are balls tossed into Congress’s court, for acceptance or not as that branch elects.⁵³

⁴² *Id.*

⁴³ *See id.*

⁴⁴ *Id.* at 2355 n.3 (“Because the approach we made explicit in *Mayo* considers all claim elements, both individually and in combination, it is consistent with the general rule that patent claims ‘must be considered as a whole.’” (quoting *Diehr*, 450 U.S. at 188)).

⁴⁵ *See id.* at 2355-60.

⁴⁶ While it has not relied upon the doctrine of *stare decisis*, the Court in *Mayo* did note that an argument presented by the government—that the other sections of the patent statute adequately protect the public from the problems associated with the claims at issue in the case — were “not consistent with prior law.” *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1303 (2012).

⁴⁷ *See generally* *Kimble v. Marvel Entm’t, LLC*, 135 S. Ct. 2401 (2015).

⁴⁸ *See id.* at 2406.

⁴⁹ *See id.*

⁵⁰ *See id.* at 2412 (“A broad scholarly consensus supports *Kimble*’s view of the competitive effects of post-expiration royalties, and we see no error in that shared analysis.”).

⁵¹ *Id.* at 2409.

⁵² *Id.*

⁵³ *Id.*

Thus, special justification is needed to overturn any interpretation of a federal statute.

But even more than the “special justification” needed to be shown in the context of the facts in *Kimble*; “superspecial” justification needed to be shown for three additional reasons.⁵⁴ First, the Court pointed to the fact that its prior case interpreted a statute rather than the Constitution.⁵⁵ Second, the Court highlighted the fact that “Congress ha[d] spurned multiple opportunities to reverse” the relevant precedent despite multiple opportunities to do so over a half century.⁵⁶ Third, the Court explained that cases involving property and contract rights favor *stare decisis* in particular “because parties are especially likely to rely on such precedents when ordering their affairs” and reversing course would “upset expectations.”⁵⁷

The Court found no “superspecial” justification in the relevant circumstances to overrule its precedent for the following reasons. First, the “statutory and doctrinal underpinnings [of the precedent] ha[d] not eroded over time.”⁵⁸ Second, “nothing about [the precedent] had proved unworkable.”⁵⁹ Third, the precedent in question was not an interpretation of antitrust law but instead patent law, and therefore did not fall within the category of antitrust cases in which the Court had “viewed *stare decisis* as having less-than-usual force.”⁶⁰ Fourth, the precedent in question did not “hinge on the mistake *Kimble* identifies,” the mistaken economic claim “that post-patent royalties harm competition.”⁶¹ Fifth, the Court rejected the argument that *stare decisis* allowed for overturning its precedent based on the “the wellspring of all patent policy: the goal of promoting innovation.”⁶²

Based on all of these considerations, it seems unlikely that the Supreme Court would reverse course in the area of patent eligibility. The Court’s patent eligibility cases hinge on the interpretation of a statutory section, § 101, that Congress has not yet amended. Thus, their reversal at least requires special justification. Moreover, “superspecial” justification may be needed. On the one hand, Congress has similarly “spurned multiple opportunities” to reverse the “true origin of inventive application as a test for patent eligibility,”⁶³ the case of *Funk Brothers Seed Co. v. Kalo Inoculant Co.*⁶⁴ That case was decided in 1948, and Congress has amended the patent statute several times since then without overturning its holding.⁶⁵ On the other hand, the Court’s recent decision

⁵⁴ See *id.* at 2410.

⁵⁵ See *id.* at 2409.

⁵⁶ *Id.*

⁵⁷ *Id.* at 2410.

⁵⁸ *Id.*

⁵⁹ *Id.* at 2411.

⁶⁰ *Id.* at 2412.

⁶¹ *Id.* at 2413.

⁶² *Id.* at 2414.

⁶³ Jeffrey A. Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565, 624 (2015) (“The true origin of inventive application as a test for patent eligibility was Justice Douglas’s opinion in *Funk Brothers*.”).

⁶⁴ *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132 (1948) (“The application of this newly-discovered natural principle to the problem of packaging of inoculants may well have been an important commercial advance. But once nature’s secret of the non-inhibitive quality of certain strains of the species of *Rhizobium* was discovered, the state of the art made the production of a mixed inoculant a simple step. Even though it may have been the product of skill, it certainly was not the product of invention.”). Since 1948, Congress has twice amended the patent statute in substantial ways. See Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011); Patent Act of 1952, Pub. L. No. 593, §§ 1-293, 66 Stat. 797 (1952) (current version at 35 U.S.C. §§ 1-376). Neither time did Congress expressly overrule *Funk Brothers*.

⁶⁵ See, e.g., Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011); American Inventors Protection Act

in *Mayo* somewhat resurrects the bad law from *Funk* and *Parker v. Flook*,⁶⁶ which *Diehr* seemed to displace.⁶⁷ Also, patent eligibility cases do not involve contracts rights in the same manner as *Kimble*. The Supreme Court’s decisions on patent eligibility affect inventors and users of technology. Inventors would not be adversely affected by a change in the law to the extent they have decided *not* to invent given *Mayo* and *Alice*. Users of technology, however, might cry foul based on their reliance on the Court’s decisions on patent eligibility to order their affairs. In particular, users of technology may have decided to use certain technology on the basis of belief that the two-part test articulated in *Mayo* and *Alice* renders certain patent claims invalid.

Regardless of whether special or “superspecial” justification is needed to overturn *Mayo* and *Alice*, there is significant doubt that the Supreme Court would find the relevant hurdle cleared. Pointing in the direction of *stare decisis* stands the fact that the statutory and doctrinal underpinnings of *Mayo* and *Alice* have not eroded over time. In particular, Congress has not rewritten § 101 and the Court has not overturned any of its patent eligibility precedent. Furthermore, the precedent in question was an interpretation of patent law, not antitrust law. Moreover, the Court is unresponsive to arguments based on the goal of promoting invention and innovation. Pointing in the direction of overturning the Court’s precedent, by contrast, stands the fact that everything about the Court’s precedent has proven unworkable; as I have shown, the two-part test simply is not administrable.⁶⁸ In addition, recent scholarship has highlighted that one of the primary bases for the Court’s approach in this area—the old case of *Neilson v. Harford*—in fact condemns the Court’s approach.⁶⁹ In short, while some factors favor allowing the Court to reverse its precedent on patent eligibility, more favor the application of *stare decisis*. And given the Court’s aggressive application of *stare decisis* in *Kimble*, it seems unlikely that the Court would reverse its precedent in the area of patent eligibility.

But the Court would have to grant a petition for certiorari to even reach the question of whether the two-part test set forth in *Mayo* and *Alice* should be overturned. And recently the Court denied certiorari in *Ariosa v. Sequenom*,⁷⁰ a case in which (as discussed above) the Federal Circuit judges practically cried out for guidance on how to apply the two-part test set forth in *Mayo* and *Alice*. Despite the Federal Circuit judges’ desperate pleas—and twenty-two amicus briefs in favor of certiorari compared to none opposing it—the Supreme Court denied a petition for a writ of

of 1999, Pub. L. No. 106-113, 113 Stat. 1501 (1999).

⁶⁶ *Parker v. Flook*, 437 U.S. 584 (1978).

⁶⁷ *Compare Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294, 1304 (2012) (“Those cases . . . 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. . . . We recognize that, in evaluating the significance of additional steps, the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap.”), *Flook*, 437 U.S. at 594 (“Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.”), and *Funk*, 333 U.S. at 131 (“But a product must be more than new and useful to be patented; it must also satisfy the requirements of invention or discovery.”), with *Diamond v. Diehr*, 450 U.S. 175, 193 n.15 (1981) (“In order for the dissent to reach its conclusion it is necessary for it to read out of respondents’ patent application all the steps in the claimed process which it determined were not novel or ‘inventive.’ That is not the purpose of the § 101 inquiry and conflicts with the proposition recited above that a claimed invention may be entitled to patent protection even though some or all of its elements are not ‘novel.’”).

⁶⁸ See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 227-35 (2017).

⁶⁹ See, e.g., Jeffrey A. Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565, 570 (2015).

⁷⁰ *Ariosa v. Sequenom*, 788 F.3d 1371 (Fed. Cir. 2015).

certiorari.⁷¹ Beyond its denial of certiorari in this important case, however, there are additional signs of just how out of touch the Supreme Court remains with respect to its patent eligibility jurisprudence. First, the Court did not even request the Solicitor General’s view on whether it should grant or deny certiorari, an increasingly common practice and one clearly justified in view of the Federal Circuit judges’ views and the overwhelming, unanimous amici support for a grant of certiorari. Second, on the same day the Court denied certiorari in *Ariosa v. Sequenom*, it granted certiorari in another relatively unimportant patent case—one addressing a narrow issue of the proper interpretation of the statutory section governing a rare form of infringement, infringement by exportation.⁷² Third, even more alarming, most recently the Court *did* request the views of the Solicitor General—but this time in a case (with little amici support) where the petitioner seeks to render ineligible patent claims to medical treatments of patients based on alleged inconsistency with the “inventive concept” requirement of *Mayo*, the opposite of the proposed reform of Section 101.⁷³ In short, the Supreme Court has signaled that it is unwilling or unable to solve the crisis of confusion, lack of administrability, incorrect results, and reduced incentive to invent that its jurisprudence has created.

B. Self-Help is Not a Viable Response to Calls for Reform

Beyond recognizing that the Supreme Court is unlikely to correct patent eligibility law, it is important to recognize that self-help is not a viable response to calls for reform. Given the failings of the patent system, inventors and their investors might consider alternative protections for investments in research and development. These alternatives, however, fail to make up the gap.

Consider three existing alternative mechanisms to support investment: (1) trade secrecy; (2) government grants and tax incentives; and (3) patent protection outside the United States.

Trade secrecy is one legal route available to protect investment in research and development. It is important to note that “information eligible for trade secret protection may or may not be eligible for patent protection.”⁷⁴ Moreover, “there is no novelty requirement for trade secret protection.”⁷⁵ Technological information may be protected “so long as the information remains secret and maintains its value.”⁷⁶ One of the significant problems with respect to using trade secret law to protect discoveries and their practical applications, however, is that, “[u]nlike patent law, trade secret protection affords no recourse against someone who reverse engineered or independently created the subject matter of a trade secret.”⁷⁷ Indeed, the Uniform Trade Secrets Act “precludes trade secret protection if the information could be ‘readily ascertainable by proper

⁷¹ See *Sequenom, Inc. v. Ariosa Diagnostics, Inc.*, 136 S. Ct. 2511 (2016) (mem.) (denial of certiorari).

⁷² See *Life Techs. Corp. v. Promega Corp.*, 773 F.3d 1338 (Fed. Cir. 2014), *cert. granted*, (June 27, 2016) (No. 14-1538).

⁷³ See *Hikma Pharms. USA Inc. v. Vanda Pharms. USA, Inc.*, No. 18-817, 139 S. Ct. 1368 (2019) (mem.) (inviting the Solicitor General to file a brief expressing the views of the United States); *Hikma Pharms. USA Inc. v. Vanda Pharms. USA, Inc.*, No. 18-817, 2018 WL 6819525 (U.S. Dec. 20, 2018) (petition for writ of certiorari) (“In the decision below, a divided Federal Circuit panel did exactly what *Mayo* forbids: it exempted all patent claims that are drafted as reciting a method of medically *treating* patients from [the required] analysis.”). The Supreme Court also recently requested the views of the Solicitor General in another case about whether patent eligibility is a question of law or fact. *HP Inc. v. Berkheimer*, No. 18-415, 139 S. Ct. 860 (2019) (mem.) (inviting the Solicitor General to file a brief expressing the views of the United States); *HP Inc. v. Berkheimer*, No. 18-415, 2018 WL 4819013 (U.S. Sept. 28, 2018) (petition for writ of certiorari) (“The question presented is whether patent eligibility is a question of law for the court based on the scope of the claims or a question of fact for the jury based on the state of the art at the time of the patent.”).

means.”¹⁵ Furthermore, trade secrecy may fail for some inventions if government regulations require disclosure.

Another potential avenue to support research and development are government grants. This mechanism “includes direct spending on government research laboratories and grants to nongovernment researchers.”¹⁶ There is reason to think that direct spending and grants to nongovernment researchers may be necessary to create incentives for basic research when market forces may not yet play a significant role in attracting investment, in part because even under the old standard of patent eligibility *unapplied* discoveries were not eligible for patenting. But for either unapplied or applied discoveries, a significant limitation, beyond the extent of the government’s largess, is the government’s control of the purse strings; “the decision about which projects are funded and how much funding they receive is made by central planners, not individual researchers or market actors.”¹⁶ A mechanism that avoids these two limitations (the extent of the government’s largess and its control of the purse strings) is tax incentives. In the United States, for example, the tax statute includes “the expensing of research and experimental expenditures . . . and the credit for increasing research activities.”¹⁶ But these mechanisms do not ensure any return on investments in privately-funded research and development. Indeed, like trade secret law, these tax incentives do not prohibit reverse engineering or independent creation, and therefore any increase investment in research and development may not result in profitability.

Another mechanism that might protect investment in research and development is patent protection outside the United States. Indeed, there has been “an inversion of relative patent-eligibility standards between the United States and other developed countries, some of which now maintain significantly more generous standards of patent-eligible subject matter.”¹⁷ Thus, one study has shown that over 1,700 patent applications covering the same inventions were rejected in the United States as ineligible and not rejected as ineligible in both China and the European Union.¹⁸ Protection in countries outside the United States, of course, does not remedy the loss of protection in the United States. From the perspective of an investor in research and development, the United States is a significant market to use to obtain a return on the any investment. By any means of comparison, the United States market provides a significant opportunity to exploit with respect to patented technology.¹⁹ The inability of an inventor to exclude competitors using the same technology significantly undermines the ability of the inventor to charge supra-competitive prices for its own goods or services or to license others to do the same. Moreover, protection in foreign countries but not the United States hardly reflects the best interest of the economy in the United States. The patent system, in particular, has long driven a significant portion of the economic activity in the country.²⁰

Given deficiencies associated with these existing alternative mechanisms to support investment in research and development, again I reach the same conclusion: the time has come for reform of the law of patent eligibility.

C. It is Appropriate for Congress to Take Action to Change Patent Eligibility Law

It is appropriate for Congress in particular to take action to change patent eligibility law. Such action would likely withstand a challenge under the Constitution. In short, eligibility law is likely a question of policy appropriately directed to Congress.

The Constitution, of course, grants to Congress the power to craft a patent statute that promotes the progress of the useful arts by providing exclusive rights in discoveries to inventors for limited time periods.⁷⁴ But the Supreme Court might confront an argument one day that Congress passed an unconstitutional amendment to the Patent Act when it overruled the Court's precedent in favor of expanded patent eligibility. Congress overstepped its bounds, so the argument would go, because by expanding eligibility Congress impeded rather than promoted the progress of the useful arts.

The Supreme Court has stated that the constitutional provision in question is “both a grant of power and a limitation.”⁷⁵ In terms of how the provision limits the power of Congress, the Court has explained that Congress may not

enlarge the patent monopoly without regard to the innovation, advancement or social benefit gained thereby. Moreover, Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available. Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must ‘promote the Progress of . . . useful Arts.’ This is the standard expressed in the Constitution and it may not be ignored.⁷⁶

Congress must ensure that any legislation addressing the non-statutory exceptions, including any legislation amending § 101, complies with these restrictions. In particular, any such legislation must have social utility by encouraging the creation and disclosure of inventions that add to the “sum of useful knowledge,” and conversely must not remove existent knowledge from the public domain or restrict free access to materials already available.

In terms of how the provision empowers Congress, the Court has likewise explained:

Within the limits of the constitutional grant, the Congress may, of course, implement the stated purpose of the Framers by selecting the policy which in its judgment best effectuates the constitutional aim. This is but a corollary to the grant to Congress of any Article I power. Within the scope established by the Constitution, Congress may set out conditions and tests for patentability.⁷⁷

Thus, Congress has broad power to select the policy that in its view best promotes the progress of the useful arts, and to set forth statutory conditions and requirements for patentability consistent with its view of the best policy.

Given this broad power given to Congress under the Constitution to fashion the conditions and requirements of patentability, the Supreme Court would likely defer to Congress and find

⁷⁴ U.S. CONST. art. I, § 8, cl. 8 (authorizing Congress to pass laws “[t]o promote the Progress of . . . useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries”).

⁷⁵ *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 5 (1966).

⁷⁶ *Id.* at 6.

⁷⁷ *Id.* (citations omitted).

legislation that clarifies or eliminates the non-statutory exceptions to be constitutional. Indeed, in *Kimble* the Court repeatedly highlighted that it is the role of Congress to correct the Supreme Court's mistakes in statutory interpretation and determination of patent policy.⁷⁸ While the Court ultimately decided not to reverse its precedent related to patent misuse law based on the doctrine of *stare decisis*, in this context the Court explained why Congress has the power to overturn the Court's precedent.⁷⁹ Thus, the Court's reasoning in *Kimble* is highly relevant to any challenge to an amendment to the patent statute to overturn the Court's precedent interpreting the patent statute.

So, what was the Court's reasoning? The Court explained that, “[b]y contrast with the Sherman Act, the patent laws do not turn over exceptional law-shaping authority to the courts.”⁸⁰ It went on to say that “[c]laims that a statutory precedent has ‘serious and harmful consequences’ for innovation are (to repeat this opinion’s refrain) ‘more appropriately addressed to Congress.’”⁸¹ In more detail, it explained:

That branch, far more than this one, has the capacity to assess *Kimble*'s charge that *Brulotte* suppresses technological progress. And if it concludes that *Brulotte* works such harm, Congress has the prerogative to determine the exact right response—choosing the policy fix, among many conceivable ones, that will optimally serve the public interest.⁸²

By simultaneously adhering to its precedent and deferring to Congress, the Court claimed it would “promote the rule-of-law values to which courts must attend while leaving matters of public policy to Congress.”⁸³ And, finally, in the end the Court conclusively stated that “the choice of what patent policy should be lies first and foremost with Congress.”⁸⁴

While there is a significant question whether the Court was correct when it proclaimed that the patent misuse doctrine is “statutory precedent,”⁸⁵ the Court would likely view its precedent in the area of patent eligibility as “statutory precedent.” In these cases, the Court has repeatedly explained that it derives the judicial exceptions from the statutory text of § 101.⁸⁶ The Court, by contrast, has not couched its subject matter eligibility cases as addressing matters of constitutional interpretation rather than statutory interpretation.⁸⁷ Thus, with respect to efforts to amend the patent

⁷⁸ See, e.g., *Kimble v. Marvel Entm't, LLC*, 135 S. Ct. 2401, 2409 (2015) (“All our interpretive decisions, in whatever way reasoned, effectively become part of the statutory scheme, subject (just like the rest) to congressional change. Absent special justification, they are balls tossed into Congress’s court, for acceptance or not as that branch elects.”); *id.* at 2414 (“[T]he choice of what patent policy should be lies first and foremost with Congress.”).

⁷⁹ See *id.* at 2409, 2412-14.

⁸⁰ *Id.* at 2413.

⁸¹ *Id.* at 2414 (quoting *Halliburton Co. v. Erica P. John Fund, Inc.*, 134 S. Ct. 2398, 2413 (2014)).

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.* at 2415 (Alito, J., dissenting) (“*Brulotte* was . . . a bald act of policymaking. It was not simply a case of incorrect statutory interpretation. It was not really statutory interpretation at all.”).

⁸⁶ See, e.g., *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) (“We have interpreted § 101 and its predecessors in light of this exception for more than 150 years.”).

⁸⁷ While the Court has not referred expressly to the Constitution in this context, the closest the Court has come is probably in *Mayo*, where it referred to the purpose of promoting innovation:

‘Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.’ And monopolization of those tools through the grant of a

statute to expand eligibility (or more precisely return patent eligibility to its traditional breadth), *Kimble* is helpful. It signals the probability that the Court will defer to Congress with respect to any codification or overruling of Supreme Court precedent related to patent eligibility. Thus, while it is likely that the Supreme Court would rely upon *stare decisis* to reject any argument for the Court to overturn its precedent on § 101, it simultaneously is likely that the Court would defer to Congress to the extent Congress adopts another standard or weighs the competing policies differently.

Moreover, the Court's opinion in *Kimble* explicitly ties its analysis in the context of its precedent on patent misuse to its precedent on eligible subject matter. Indeed, in dicta the Court went out of its way to highlight these points in the very context of its precedent applying "subject matter limits" to patenting, when *Kimble* itself did not relate to subject matter eligibility.⁸⁸ The Court states that it has "carefully guarded [the] cut-off date, *just as it has the patent law's subject matter limits*: In case after case, the Court has construed those laws to preclude measures that restrict free access to formerly patented, *as well as unpatentable*, inventions."⁸⁹ While dicta, this language highlights that, like the court's precedent on patent misuse, the court's precedent on eligible subject matter is a matter of statutory interpretation based on the Court's view of the governing policies. In other words, just as in *Kimble* with respect to patent misuse law, however carefully the Court has guarded eligibility, the exact content of the law guarding eligibility is a matter of policy that is first the responsibility of Congress.

Other Supreme Court opinions more clearly make the case that eligibility law is a question of policy appropriately directed to Congress. In *Gottschalk v. Benson*, for example, the Court noted that "considerable problems are raised" by the prospect of eligibility for computer programs, "which only committees of Congress can manage, for broad powers of investigation are needed, including hearings which canvass the wide variety of views which those operating in this field entertain."⁹⁰ Now, as then, "considered action by the Congress is needed."⁹¹ In like fashion, the Court in *Parker v. Flook* stated that "[d]ifficult questions of policy concerning the kinds of programs that may be appropriate for patent protection . . . can be answered by Congress on the basis of current empirical data not equally available to this tribunal."⁹² More recently, in *Mayo* the Court highlighted its belief that it is "the role of Congress in crafting more finely tailored rules where necessary" such that the Court did not need to "determine here whether, from a policy perspective, increased protection for discoveries of diagnostic laws of nature is desirable."⁹³ Similarly, in *Association for Molecular Pathology v. Myriad Genetics, Inc.*, the Court rebuffed the argument that it should consider the reliance interest of patent owners based on USPTO

patent might tend to impede innovation more than it would tend to promote it.

Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1293 (2012) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Innovation is not exactly the purpose of patent law, however. Patent law seeks to promote invention—the creation of new technology—and not necessarily innovation—the use of new technology. *See generally, e.g.*, *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 429-30 (1908) (finding no requirement to practice or license a patented invention). And anyway the Court's interpretation of § 101 is not needed to address the Court's concerns with "the basic tools of scientific and technological work." *See* David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 190, 212-21 (2017).

⁸⁸ *Kimble*, 135 S. Ct. at 2407.

⁸⁹ *Id.* (emphasis added).

⁹⁰ *Gottschalk*, 409 U.S. at 73.

⁹¹ *Id.*

⁹² *Parker v. Flook*, 437 U.S. 584, 595 (1978).

⁹³ *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289, 1305 (2012).

determinations of eligibility; it indicated that “[c]oncerns about reliance interests arising from PTO determinations, insofar as they are relevant, are better directed to Congress.”⁹⁴

If Congress acted upon these statements and passed legislation overruling (as opposed to codifying or clarifying) the Supreme Court’s two-part test for eligibility, however, the Court might still be called upon to decide whether that legislation was unconstitutional. An important consideration in this regard is that any argument that a statutory amendment to § 101 (or another form of legislation eliminating or modifying the current non-statutory exceptions) is unconstitutional would have to prove that the entire patent statute, not just § 101, is unconstitutional. Congress has not decreed that any claim that complies with the eligibility requirement of § 101 must issue in a patent. No, by its very terms § 101 requires compliance, not just with the subject matter and utility requirements articulated in § 101, but also with the other “conditions and requirements of this title.”⁹⁵

The patent statute includes many patentability and specification requirements.⁹⁶ Any challenge to the constitutionality of legislation eliminating the non-statutory exceptions would have to analyze whether the combination of all of these requirements (subject matter, utility, novelty, non-obviousness, written description, enablement, the limitation on functional claiming, and definiteness) fail to bar patents from issuing to unworthy patent applicants, such that it is clear that those patents do not promote the progress of discovery in the useful arts but instead impede that progress. Unfortunately, what might have led to the present state of the law governing eligibility is the fact that the Supreme Court repeatedly confronts cases where the only question it is tasked with answering is the correct application of its case law applying the non-statutory exceptions excluding laws of nature, physical phenomena, and abstract ideas from patenting.⁹⁷ In the face of a constitutional challenge, by contrast, the Court would not be able to avoid consideration of all of the statutory doctrines that already address concerns with the ability to claim laws of nature, physical phenomena, and abstract ideas.

In this regard, it is important to recognize the problem with the related arguments made by perhaps the most frequent and animated judicial supporter of the Supreme Court’s approach to § 101, Senior Circuit Judge Haldane Mayer of the Federal Circuit. He makes several arguments in support of a central role in the analysis of patent claims for § 101 and, in particular, the Supreme Court’s law on eligibility. First, he criticizes “the view that section 101 is a ‘coarse eligibility filter’ and that other patent validity requirements—such as novelty, non-obviousness, and adequate written description—should be used to weed out patents of dubious quality.”⁹⁸ He argues that the other patentability requirements have, “as a practical matter, proved woefully inadequate in preventing a deluge of very poor quality patents.”⁹⁹ Second, as a matter of precedent he cites recent Supreme Court opinions as justification for a robust application of § 101.¹⁰⁰ Third, and most relevant

⁹⁴ *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2119 n.7 (2013).

⁹⁵ 35 U.S.C. § 101 (2012).

⁹⁶ See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 186-88 (2017).

⁹⁷ See *Mayo*, 132 S. Ct. at 1303 (“The relevant cases rest their holdings upon section 101, not later sections.”).

⁹⁸ *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1268 (Fed. Cir. 2012) (Mayer, J., dissenting) (citations omitted).

⁹⁹ *Id.*; see also *id.* (“[T]here is no evidence that relying on §§ 102, 103, or 112 will solve the problem [of poor quality business method and software patents]. This claim was made ten years ago. It is still being made now. At what point does this argument run out of credibility?” (quotation marks and footnote call number omitted) (quoting Gerard N. Magliocca, *Patenting the Curve Ball: Business Methods and Industry Norms*, 2009 BYU L. REV. 875, 900)).

¹⁰⁰ See *id.* at 1268-69.

here, he concludes that “[a] robust application of section 101 is *required* to ensure that the patent laws comport with their constitutionally-defined objective.”¹⁰¹

Judge Mayer’s arguments fail to prove that § 101, in particular, must be—to use his metaphor—a “fine eligibility filter” that *alone* ensures that no “poor quality patents” issue.¹⁰² In any particular case, a judge cannot conclude that a non-statutory exception is *necessary* let alone *required by the Constitution* unless that judge has analyzed every other statutory requirement—and the evidence relevant to compliance with those requirements—and concluded that those requirements fail to exclude an unworthy claim from issuance. Judge Mayer, in particular, has not expressly made this analysis in the cases where he has made sweeping conclusions regarding the necessity of the non-statutory exceptions.¹⁰³ Nor has he identified any independent purpose of the non-statutory exceptions in terms of policy, let alone any particular failings of interpretations or applications of existing patentability and specification requirements to meet the objectives of those policies. He has made only generalized criticisms of “poor patent quality,”¹⁰⁴ which does not help advance the cause of identifying particular problems with the existing statutory law, let alone solving them. Moreover, it is not a sufficient argument, in terms of a policy debate at least, to point to the Supreme Court’s confusing precedent. And, anyway, even if it is true that the statutory patentability requirements are not working based on some preferred policy goal, problems with those requirements ought to be addressed and corrected directly—whether through better interpretations of the existing statutory language or by amending the relevant statutory language.

In short, in view of all of the problems with the Supreme Court’s jurisprudence on the issue of patent eligibility, the time has come for Congress to consider overturning the Court’s approach in this area. Given the doctrine of *stare decisis*, it is unlikely that the Supreme Court will resolve the confusion it has created and put in place an administrable test for eligibility. As a result, and given its broad constitutional authority, Congress should do so; it should seek to provide greater clarity regarding the appropriate policies governing eligibility and the statutory patentability requirements, to provide administrable tests to further those policies, to ensure correct results in particular cases, and to maintain the incentive patent law provides for potential inventors and their supporters to invest in the acts of invention—research and development. Such legislation would not likely violate the Constitution;¹⁰⁵ instead it would reflect Congress taking responsibility to fine tune the patent statute to ensure that appropriate statutory patent law doctrines “promote the Progress of . . . useful Arts.”¹⁰⁶

¹⁰¹ *Id.* at 1269 (emphasis added).

¹⁰² *See id.* at 1268 (criticizing those who “take the view that section 101 is a ‘coarse eligibility filter’”); *see also* *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 720 (Fed. Cir. 2014) (Mayer, J., concurring).

¹⁰³ *See* *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1364 (Fed. Cir. 2015) (Mayer, J., concurring); *Ultramercial*, 772 F.3d at 718; *MySpace*, 672 F.3d at 1269.

¹⁰⁴ *MySpace*, 672 F.3d at 1268.

¹⁰⁵ For another perspective on the issue of the constitutionality of legislation overruling the Supreme Court on the issue of the non-statutory exceptions, see Hayden W. Gregory, *Patent Eligibility: Should Congress Overrule the Supreme Court’s Recent Decisions? Would the Court Overrule the Overrule?*, 7 LANDSLIDE 1, 65 (2015) (“Should Congress decide to depart from th[e] tradition [of not adding statutory requirements for patentability] and no longer leave ‘wide latitude for judicial construction,’ the Court’s precedents allow it wide latitude for decision, ranging from confirmation as an exercise of Congress’s legislative authority to rejection as an act in excess of its constitutional power.”).

¹⁰⁶ U.S. CONST. art. I, § 8, cl. 8 (authorizing Congress to pass laws “[t]o promote the Progress of . . . useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries”).

D. There is Broad Consensus that Legislative Reform is Needed

Not only would legislative reform be permissible, there is broad consensus that it is necessary.

Given all of what has already been discussed, it is perhaps not surprising—as striking as it is to see—that Federal Circuit judges have called for legislative reform. Judges Lourie and Pauline Newman, in particular, expressed their belief in two identical opinions issued on the same day in two cases that “the law needs clarification, perhaps by Congress, to work its way out of what so many in the innovation field consider are § 101 problems.”¹⁰⁷ They explained that “[i]ndividual cases, whether heard by this court or the Supreme Court, are imperfect vehicles for enunciating broad principles because they are limited to the facts presented.”¹⁰⁸ “Section 101 issues,” they continued, “certainly require attention beyond the power of this court.”¹⁰⁹

In their opinions, Judges Lourie and Newman analyze the inventive concept requirement in the context of the prohibition on patenting abstract ideas, on the one hand, and physical phenomena and natural laws, on the other. With respect to the prohibition on patenting abstract ideas, they effectively propose eliminating the search for an inventive concept for two reasons: (1) it is unnecessary given the first step in the current patent eligibility analysis; and (2) separate legal doctrines, the novelty and non-obviousness requirements, already account for the underlying concern:

[W]hy should there be a step two in an abstract idea analysis at all? If a method is entirely abstract, is it no less abstract because it contains an inventive step? And, if a claim recites ‘something more,’ an ‘inventive’ physical or technological step, it is not an abstract idea, and can be examined under established patentability provisions such as §§ 102 and 103.¹¹⁰

With respect to the prohibition on patenting physical phenomena and natural laws, they also again effectively propose eliminating the search for an inventive concept: “claims to using such processes should not be barred at the threshold of a patentability analysis by being considered natural laws, as a method that utilizes a natural law is not itself a natural law.”¹¹¹ In other words, it does not matter if a claim includes an inventive concept as long as it claims a use (any use) of a physical phenomenon or natural law.¹¹² In this latter respect, it is important to note that while Judge Lourie and Judge Newman do not cite any support for their position, the long history of the patent utility doctrine indicates that the relevant question related to the usefulness of a discovery or

¹⁰⁷ *Berkheimer v. HP Inc.*, 890 F.3d 1369, 1374-76 (Fed. Cir. 2018) (Lourie, J., concurring in the denial of the petition for rehearing en banc); *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 890 F.3d 1354, 1359-62 (Fed. Cir. 2018) (Lourie, J., concurring in the denial of the petition for rehearing en banc).

¹⁰⁸ *E.g.*, *Berkheimer*, 890 F.3d at 1374 (Lourie, J., concurring in the denial of the petition for rehearing en banc).

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 1375-76 (Lourie, J., concurring in the denial of the petition for rehearing en banc).

¹¹¹ *Id.* at 1376 (Lourie, J., concurring in the denial of the petition for rehearing en banc).

¹¹² Judges Lourie and Newman also take the position that “finding, isolating, and purifying such products are genuine acts of inventiveness,” and so should meet the inventive concept requirement even if it is retained. *Id.*

invention is whether it has any practical use, not whether it has an inventive use, whatever that really means.¹¹³

Beyond these judges, the Section 101 Workshop revealed a broad consensus that legislation is needed to overcome the problems generated by the current patent eligibility framework, particularly in bioscience, given the Supreme Court’s lack of interest or ability to improve the law. In our report, we recognized that “a consensus emerged that the current state of the law is indefensible as a matter of legal principle and is causing particular difficulties for bioscience fields”¹¹⁴ and that “[p]articipants largely agreed that the Supreme Court did not appear poised to make further significant pronouncements about the scope of patentable subject matter in the foreseeable future.”¹¹⁵ “As a result,” we reported, “participants largely agreed that legislation would be necessary to address the problems that have emerged for bioscience researchers.”¹¹⁶ Indeed, “[t]he discussion repeatedly returned to the need for legislation to address the problems plaguing patent eligibility.”¹¹⁷ Our report highlights how often the conversation returned to the need for legislative reform; we mention the need several additional times:

- “Many, but not all, participants agreed that legislation would be appropriate to solve problems caused by the current state of the law.”¹¹⁸
- “Many participants highlighted the need for a clear legislative solution over the existing common law scheme.”¹¹⁹
- “In the end, many participants, particularly those in bioscience fields but also some in software fields, expressed an urgent need for a legislative solution.”¹²⁰

III. Guidelines for Evaluating Reform Proposals

I submit that four basic principles should guide any legislative effort to correct patent eligibility law: broad eligibility, clarity, constraint on judicial intervention, and flexibility.¹²¹

A. Broad Eligibility

The Constitution identifies the goal of the patent system: promotion of the progress of the useful arts.¹²² The Constitution likewise specifies the way to achieve that result, by securing for limited times to inventors the exclusive right to their discoveries.¹²³ In exchange for the disclosure and publication of their inventions, the government grants inventors a temporary right to exclude use of their inventions. The basic proposition is that granting inventors a temporary right to exclude

¹¹³ See Jeffrey A. Lefstin et al., *Final Report of the Berkeley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenges*, 33 BERKELEY TECH. L.J. 555, 568-75 (2018).

¹¹⁴ *Id.* at 592.

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.* at 593.

¹¹⁸ *Id.* at 594.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ See David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149, 2189-97 (2017).

¹²² U.S. CONST. art. I, § 8, cl. 8 (authorizing Congress to pass laws “To promote the Progress of . . . useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries”).

¹²³ See *id.*

others from using their discoveries will encourage inventors and their supporters to invest in research and development that, often enough at least, produces discoveries that will better the state of mankind. Patents stimulate investments that generate these inventions because of the ability of inventors and their investors to obtain legal rights against infringers, including against free riders—those who do not invest in the development of the underlying inventions. The patent system, in the words of Abraham Lincoln, “added the fuel of interest to the fire of genius.”¹²⁴ That “interest” is an economic one; the prevailing understanding is that the patent system is based on a utilitarian theory, not a natural rights theory.¹²⁵ And, while the question of whether patent law is necessary or efficient in general to achieve its goal is unproven and perhaps unprovable,¹²⁶ it is the theory that Congress has adopted and put into practice through the patent statute.¹²⁷ The leadership of U.S. inventors in the development of all kinds of inventions certainly has not undermined this theory. Indeed, given this history, one can reasonably conclude that the U.S. patent system has historically worked extremely well to encourage invention. The software industry is a good example. Even after the Federal Circuit determined in the 1998 that software qualified as patent eligible subject matter,¹²⁸ the nation’s software industry flourished.

For the theory of the patent system to be successful, however, inventors and their supporters must anticipate legal protection at the outset, at the time they decide to invest in research and development. Also, with declining significance, they must anticipate legal protection all the way along the path toward discovery, lest they abandon their pursuits. Broad eligibility is, thus, consistent with the theory. Inventors and their supporters must expect the fruits of their labors to be eligible for patenting. Exceptions, then, should be targeted statutorily only when there is some justification. Theoretically, patent protection may not be necessary when the government already sufficiently invests in the relevant research and development or when there are other sufficient incentives, such as respect in the relevant field or monetary prizes, that stimulate investment in research and development.¹²⁹ As discussed above, however, there are deficiencies associated with

¹²⁴ ABRAHAM LINCOLN, *Lecture on Discoveries and Inventions*, in ABRAHAM LINCOLN: SPEECHES AND WRITINGS, 1859-1865, at 10-11 (Don E. Fehrenbacher ed., 1989); see also MICHAEL NOVAK, *THE FIRE OF INVENTION, THE FUEL OF INTEREST: ON INTELLECTUAL PROPERTY 1* (1996).

¹²⁵ See *Mazer v. Stein*, 347 U.S. 201, 219 (1954) (“The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in ‘Science and useful Arts.’ Sacrificial days devoted to such creative activities deserve rewards commensurate with the services rendered.”); Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 (1994) (“In short, the patent system prevents others from reaping where they have not sown and thereby promotes research and development (R & D) investment in innovation. The patent law achieves this laudable end by creating property rights in inventions.”).

¹²⁶ See, e.g., SUBCOMM. ON PATENTS, TRADEMARKS, & COPYRIGHTS OF THE COMM. ON THE JUDICIARY, 85TH CONG., AN ECONOMIC REVIEW OF THE PATENT SYSTEM (Comm. Print 1958) (“If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it.”).

¹²⁷ The question of whether patent law is *not* necessary or *inefficient* in general to achieve its goal is similarly unproven and perhaps unprovable. See *id.* Likewise, some may argue that the Supreme Court’s current approach actually substantially increases incentives to invest in research and development because there is less fear of claims of patent infringement. This argument, however, to a large extent contradicts the very basis for the patent system. There is no data proving this position, and the burden of proving the patent system is unnecessary falls on opponents of the patent system, who have been unable to substantiate this claim. See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 163 n.21 (2017). In a very real sense, these opponents of the patent system favor faith in the lack of a need for the patent system over the historical evidence pointing to its success.

¹²⁸ See generally *State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368 (Fed. Cir. 1998) (finding computer software patent eligible applying a “useful, concrete, and tangible result” test).

¹²⁹ See generally Lisa Larrimore Ouellette, *Patentable Subject Matter and Nonpatent Innovation Incentives*, 5 UC IRVINE L. REV. 1115 (2015).

existing alternative mechanisms to support investment in research and development. Government funds in particular are limited. Moreover, government investment is not a substitute for private investment.

None of this denies that there are significant concerns with overpatenting. But the basis to deal with the problem of overpatenting should be the statutory doctrines Congress actually put in place to limit the ability to obtain patents. Those statutory doctrines are the utility and subject matter requirements of § 101, the novelty requirement and statutory bars of § 102, the non-obviousness requirement of § 103, and the written description, enablement, definiteness, and functional claiming requirements of § 112.¹³⁰ Collectively, those are what I refer to here as the patentability and specification requirements. As the statute is currently constructed, however, the exceptions from *eligibility* include only the utility and subject matter requirements of § 101. It is the role of the remaining patentability and specification requirements to determine whether a patent will issue based on the unique policy concerns of those other requirements and the detailed legal analyses those requirements specify.

In short, the history of the successful use of the U.S. patent system to encourage investment in inventive efforts indicates two things. First, because the patent system has worked well in encouraging invention, Congress should err on the side of patent eligibility. Second, again because the patent system has worked well in encouraging invention, the burden should be on those challenging subject matter eligibility in particular areas to demonstrate why patents will not stimulate invention and disclosure in those areas.

B. Clarity

Beyond broad eligibility, a guiding principle for any statutory reform should include clarity. Blurry lines do not induce inventors and their supporters to invest in research and development; blurry lines create risk, which suppresses investment. Nor, by the way, does change—or even the prospect of change—of the governing rules of conduct support investment in research and development.¹³¹ Thus, Congress needs to get reform right so it does not have to revisit the doctrine again.

C. Constraint on Judicial Intervention

The next principle that should guide any attempt to correct the law governing patent eligibility is the need to put constraints on judicial intervention in this area. The Supreme Court has not been shy about interpreting § 101 without regard for its explicit text, but instead based on the Court’s own view of the governing policies, to create exceptions to patent eligibility. The Court itself calls the group of exceptions an “implicit exception.”¹³² In truth, the exceptions are common

¹³⁰ See 35 U.S.C. §§ 101 (2012) (subject matter), 102 (novelty and statutory bars), 103 (non-obviousness), 112(a) (written description and enablement), 112(b) (definiteness), 112(f) (functional claiming).

¹³¹ See John M. Golden, *The Supreme Court as “Prime Percolator”: A Prescription for Appellate Review of Questions in Patent Law*, 56 UCLA L. REV. 657, 687 (2009) (describing the impact of uncertainty caused by lack of clarity and change itself on “private planning and commerce”).

¹³² See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012) (“The Court has long held that [35 U.S.C. § 101] contains an important implicit exception. ‘[L]aws of nature, natural phenomena, and abstract ideas’ are not patentable.” (quoting *Diamond v. Diehr*, 450 U.S. 175, 185 (1981))).

law exceptions resulting from policymaking divorced from the text of the statute. The Court does not attempt to tie the exceptions to the statutory text. Even the conservative Supreme Court Justices—who elsewhere tout the importance of textual interpretation¹³³—in the context of patent eligibility resort to, or at least comply with, bald policymaking at worst, and loose interpretations of the statutory text at best.¹³⁴

The Supreme Court’s approach to eligibility and its decision to require a search for an inventive concept is policymaking; this became clear recently when Judge Dyk highlighted problems with the Supreme Court’s approach and offered a solution based on his own view of the best policy. Judge Dyk proposed that inventors be entitled to pursue claims to practical applications of natural laws and physical phenomena, *but only when those practical applications have been actually reduced to practice*, in other words built and tested as necessary to confirm that they work.¹³⁵ He would not allow inventors to pursue claims to practical applications of natural laws and physical phenomena when those inventors have only disclosed how to make and use those applications in a patent application.¹³⁶ This creative solution reflected Judge Dyk’s view of how to reconcile the divergent policies underlying patent eligibility.

Similarly, the Supreme Court has not been shy about using § 101 as its “plaything”—its statutory basis to invoke considerations of policy to prohibit patents from issuing to disfavored inventions. As I have discussed, the Court repeatedly grants petitions to hear cases on eligibility rather than the other statutory patentability and specification requirements found in §§ 102, 103, and 112. The Court, it seems, cannot keep its hands off of eligibility; the doctrine of eligibility is too useful to eliminate patents and reject patent applications the Court disfavors on policy grounds. Prior to 1952, the Supreme Court used the “invention” requirement to do so;¹³⁷ now it uses the “inventive concept” requirement to do so. Despite the elimination of the “invention” requirement in the Patent Act of 1952,¹³⁸ the Court has resurrected the same requirement in the form of a requirement of an “inventive concept.”

The fact that the Supreme Court has done so is ironic given its own repeated recognition that it is not the right government institution to weigh these policies and to place these restrictions on eligibility.¹³⁹ Congress, the Court admits, is the entity of the federal government that has the

¹³³ See, e.g., ANTONIN SCALIA & BRYAN A. GARNER, *READING LAW* (2012).

¹³⁴ Both *Mayo* and *Alice* were unanimously decided, and Justice Thomas wrote the opinion in *Alice*. See *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2351 (2014); *Mayo Collaborative*, 132 S. Ct. at 1293.

¹³⁵ See *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 809 F.3d 1282, 1291 (Fed. Cir. 2015) (Dyk, J., concurring in the denial of en banc rehearing) (“[I]f the breadth of the claim is sufficiently limited to a specific application of the new law of nature discovered by the patent applicant and reduced to practice, I think that the novelty of the discovery should be enough to supply the necessary inventive concept. My proposed approach would require that the claimed application be both narrow in scope and actually reduced to practice, not merely ‘constructively’ reduced to practice by filing of a patent application replete with prophetic examples.”).

¹³⁶ See *id.*

¹³⁷ Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 404 (1960), *reprinted in* 14 FED. CIR. B.J. 135, 144 (2004) (“The requirement for ‘invention’ was the plaything of the judges who, as they became initiated into its mysteries, delighted to devise and expound their own ideas of what it meant, some very lovely prose resulting.”).

¹³⁸ See *id.* at 145 (“*The Patent Act of 1952 expresses this prerequisite to patentability without any reference to ‘invention’ as a legal requirement.* Nowhere in the entire act is there any reference to a requirement of ‘invention’ and the drafters did this deliberately in an effort to free the law and lawyers from bondage to that old and meaningless term. The word ‘invention’ is used in the statute only to refer to the thing invented. That is why the requirement of ‘invention’ should be referred to, if at all, only with respect due to that which is dead.”).

¹³⁹ See, e.g., *Gottschalk v. Benson*, 409 U.S. 63, 73 (1972) (noting that “considerable problems are raised” by the prospect of

power to consider the relevant policies and put in place a workable scheme for deciding which patent applications merit patent protection. It is hard to disagree with the Court’s own recognition that Congress has better institutional competency in this regard.¹⁴⁰

The Court’s propensity to use § 101 to prohibit patentability for all kinds of policy reasons, despite its admitted inferior institutional competency to do so, should be recognized and steps taken to prevent the Court’s intervention. In other words, Congress should make it clear that the time for judicially created, common law development of non-statutory exceptions to eligibility has past; in place of the Supreme Court’s common law should stand the statutory patentability and specification requirements put in place by Congress and the President.¹⁴¹

In particular, rather than a test dependent on the subjective views of judges or patent examiners, Congress should consider including objective guidelines constraining the analysis. Like the codification of the non-obviousness requirement in § 103, it might be helpful to identify in any statutory amendment the relevant perspective of one of ordinary skill in the art. Congress might also specify the relevant time period for the analysis—not a post hoc, backward looking reevaluation of the relevant inquiry subject to hindsight bias, but instead one focused on the perspective of one at the time of the filing of the patent application in question. In other words,

eligibility for computer programs, “which only committees of Congress can manage, for broad powers of investigation are needed, including hearings which canvass the wide variety of views which those operating in this field entertain.”).

¹⁴⁰ Given their lack of a textual basis and how clearly they represent policymaking, it is difficult to explain why the conservative justices have joined in the *Mayo* and *Alice* opinions. Perhaps they have done so because of the perception that the common law has long embraced the exceptions for natural laws, physical phenomena, and abstract ideas. In this sense, Justices Alito, Roberts, Scalia, and Thomas may be understood to have agreed with these opinions out of respect for *stare decisis*. The problem with this understanding, however, is that the search for an “inventive concept” did not become the focus of eligibility law until 2012. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012) (“[A] process that focuses upon the use of a natural law [must] 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.”). Even if there are some older cases supporting this test, *see Parker v. Flook*, 437 U.S. 584, 594 (1978) (“Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.”); *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132 (1948) (“The application of this newly-discovered natural principle to the problem of packaging of inoculants may well have been an important commercial advance. But once nature’s secret of the non-inhibitive quality of certain strains of the species of *Rhizobium* was discovered, the state of the art made the production of a mixed inoculant a simple step. Even though it may have been the product of skill, it certainly was not the product of invention.”), the Court later clearly rejected it, *see Diamond v. Diehr*, 450 U.S. 175, 187-88 (1981) (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection. . . . 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.”); *id.* at 188-89 (“The ‘novelty’ of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.”); *id.* at 192 (“[W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e. g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101.”). Indeed, some of the hallmark reasons to respect precedent with respect to the search for an “inventive concept” do not exist. Nevertheless, it seems likely, particularly after *Alice* and given other considerations, that the Court would apply *stare decisis*. *See Mayo*, 132 S. Ct. at 1294.

¹⁴¹ One way to ensure that *courts* do not use eligibility law when it should be using other sections of the patent statute, is to clarify in the patent statute that § 101 is not a defense in litigation. *See Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1341 (Fed. Cir. 2013), *vacated sub nom. WildTangent, Inc. v. Ultramercial, LLC*, 134 S. Ct. 2870 (2014) (noting that “the patentee did not argue that § 101 is not a defense to infringement”). Indeed, that may have been the original intent by the drafters of the patent statute. Section 282 conspicuously omits identification of § 101 as a defense in litigation. *See 35 U.S.C. § 282(b)* (2012). If § 101 is not a defense in litigation, however, the requirements of § 101 would still be enforceable by the USPTO and ultimately by courts in appeals from rejections by the USPTO. *See generally, e.g., Bilski v. Kappos*, 561 U.S. 593 (2010) (representing an appeal from an examiner’s rejection during prosecution).

constrain the ability to summarily make decisions based on subjective whims rather than evidence from the perspective of one of ordinary skill in the art at the time of the filing of the patent application in question. For example, the appropriate, constrained inquiry might ask whether a person of ordinary skill, at the time of the filing of the patent application in question, given their own skill combined with the disclosure of the specification, would have recognized that the claimed invention was the result of human effort and had practical utility.¹⁴²

D. Flexibility

While seemingly in tension with the last guiding principle, flexibility is an important consideration that should be taken into account when considering how to amend the patent statute. Flexibility, in the sense I use it, does not refer to malleability, but instead the ability of the law to be applied meaningfully to new, unforeseen, and even unimagined human activities. That is one of the very purposes of the patent system—to create economic incentives to encourage investment in research and development on the forefront of scientific and engineering thought; to expand the possibilities of the human race; to make the future safer, healthier, happier—in a word better—through new and improved technology.¹⁴³ To do that, the law of eligibility must be applicable to new and different—even unimagined—technologies. Those technologies should be subject to the relevant constraints.

IV. Evaluating the Most Recent Reform Proposal

With all of the above in mind, here I provide my thoughts on the most recent proposal to reform patent eligibility law: the draft bill proposed by Senators Coons and Tillis and Representatives Doug Collins, Hank Johnson, and Steve Stivers on May 22, 2019.

A. Overall Comments

While I support the thrust of the proposal in its current form—it certainly improves eligibility law over where it stands today—I do have some concerns and suggestions.

Overall the most significant aspect of the proposal with respect to patent eligibility is the elimination of the current, two-part test culminating in the search for an inventive concept in favor of the traditional, utility-based test that requires merely practical utility. I support both the elimination of the recent, ahistorical approach to patent eligibility focused on identifying an inventive application of an idea, and the codification of the longstanding historical approach to patent eligibility focused on identifying a practical application of an idea. What is practical, however, perhaps ought to be explained. Practical utility refers to an identifiable, presently available benefit. In other words, at the time the relevant patent application is filed what is claimed had an identifiable benefit. That benefit may have been readily identifiable to one of ordinary skill in the art, it may have been disclosed in the relevant patent application, or it may be able to be

¹⁴² On the other hand, inquiries into human effort and practical utility may be more akin to the inquiry into novelty pursuant to § 102, which does not invoke the perspective of one of ordinary skill in the art in the same way as the inquiry into non-obviousness. Compare 35 U.S.C. § 102 (2012) (omitting any reference to the perspective of one of ordinary skill in the art), *with id.* § 103 (referencing the perspective of “a person having ordinary skill in the art to which the claimed invention pertains”).

¹⁴³ See generally Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 404 (1960), *reprinted in* 14 FED. CIR. B.J. 135, 144 (2004).

shown later if utility is challenged. If it is clear to judges what “practical” means in this context, this aspect of the proposal holds great promise to meet the goals of broad eligibility, clarity, constraint on judicial intervention, and flexibility. I discuss these issues in more detail below.

The next most significant aspect of the proposal with respect to patent eligibility is the creation of a field of technology test. I have concerns with this test. For now let me highlight that there is no historical analogue to this test in the United States. While the European Patent Convention includes a similar test, it is unclear whether the intention is to adopt Europe’s approach or to create a new approach. And, regardless, it is rather unclear what qualifies as a field of technology. This might give substantial discretion to judges to make idiosyncratic determinations, which would undermine the predictability inventors and investors need. In short, this aspect of proposal lacks clarity and may not constrain judges. Depending upon how it is used by patent examiners and judges, it also may not ensure broad eligibility or provide flexibility. I discuss these concerns in more detail below.

The other most significant aspect of the proposal is the proposed change to the law of functional claiming. As I understand it, the concern with functional claiming relates almost exclusively to claims to computer software, whether in the form of process claims or a so-called *Beauregard* claims to computer-readable media. The current patent statute, however, already provides significant tools to address this concern. The proposed change, moreover, would impact every element of every claim of every patent application and patent, and it might significantly undermine claims in other areas of technology, including life sciences. I therefore have concerns with the necessity and breadth of this proposal. I also discuss these thoughts in more detail below.

B. Detailed Comments

1. Section 100

- a. “The term ‘useful’ means any invention or discovery that provides”

Amending the definition of “useful” is an appropriate way to address the problems with the patent eligibility requirement. The patent eligibility requirement in Section 101 includes two components: the utility requirement and the subject matter requirement. The utility requirement is present through the word “useful.” The subject matter requirement is present through the words “process, machine, manufacture, or composition of matter.” It is easier to define “useful” than to define each of the terms that make up the subject matter requirement. That said, I do have one suggestion. This definition appears to define an adjective as a noun. It may be better to begin the definition with “The term ‘useful’ means having”

- b. “specific and practical utility”

This part of the definition appears to be drawn from the interpretation of the utility requirement by the Supreme Court in *Brenner v. Manson*.¹⁴⁴ The Supreme Court said in *Manson*

¹⁴⁴ *Brenner v. Manson*, 383 U.S. 519 (1966).

that the question presented was “whether the *practical utility* of the compound produced by a chemical process is an essential element in establishing a prima facie case for the patentability of the process.”¹⁴⁵ On the other hand, the rest of the opinion does not use “practical” but instead “specific” and “substantial.” The Court indicated that, to meet the utility requirement, there must be “substantial utility” where “specific benefit exists in currently available form.”¹⁴⁶ As later explained by the Federal Circuit, “an invention cannot be considered ‘useful’, in the sense that a patent can be granted on it, unless substantial or practical utility for the invention has been discovered and disclosed where such utility would not be obvious.”¹⁴⁷ This aspect of the utility requirement has become known as the “specific and substantial utility” requirement, and sometimes the requirement of “practical utility.”¹⁴⁸ Indeed, in a later case the Court of Customs and Patent Appeals focused on “specific” and “practical” utility.¹⁴⁹ In short, while the Supreme Court used the terms “specific” and “substantial,” it also used the term “practical” and lower courts have also used the terms “specific” and “practical” to describe the same requirement. The subcommittee might make clear that the definition should be treated as a codification of this case and its progeny.

There remains the question of exactly how to codify this case, including which terms to use to codify it. In my view it is certainly better to use “practical” than “substantial.” Use of the term “substantial” might be misunderstood by some judges and patent examiners. The Federal Circuit has indicated that “practical” utility is synonymous with “substantial” utility.¹⁵⁰ Whichever word is used, however, it must be remembered that the requirement is not particularly strenuous. In *Juicy Whip, Inc. v. Orange Bang, Inc.*, the Federal Circuit stated that the “threshold of utility is not high: An invention is ‘useful’ under section 101 if it is capable of providing some identifiable benefit.”¹⁵¹ As discussed above, this requirement merely requires an identifiable, presently available use that provides some benefit. In other words, at the time the relevant patent application is filed, what is claimed must have had an identifiable use providing some benefit. Moreover, the requirement is not strenuous, as well, in the sense that there are many ways to show this utility. While (after claim construction) the analysis of utility starts with any identification of uses disclosed in the specification of a patent application or patent, the patent applicant or patent owner may present evidence from outside the specification supporting utility.¹⁵² This evidence may take the form of experimental data¹⁵³ or commercial success.¹⁵⁴ Utility likewise might be shown by expert

¹⁴⁵ *Id.* at 520 (emphasis added).

¹⁴⁶ *Id.* at 534-35 (“The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point—where specific benefit exists in currently available form—there is insufficient justification for permitting an applicant to engross what may prove to be a broad field.”).

¹⁴⁷ *Cross v. Iizuka*, 753 F.2d 1040, 1044 (Fed. Cir. 1985).

¹⁴⁸ *See, e.g., id.* (analyzing compliance with the “practical utility” requirement).

¹⁴⁹ *Application of Kirk*, 376 F.2d 936, 943 n.8 (C.C.P.A. 1967) (noting the absence of “any specific compound, possessing some specific property”); *id.* at 945 (requiring a “practical utility”); *id.* at 948 (Rich, J., dissenting) (“What the majority makes out of *Manson* by way of a test for utility under 35 U.S.C. 101 is that the compound must have ‘practical utility,’ or ‘some specific use.’”).

¹⁵⁰ *In re Fisher*, 421 F.3d 1365, 1371 n.4 (Fed. Cir. 2005).

¹⁵¹ *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366 (Fed. Cir. 1999).

¹⁵² *In re Fisher*, 421 F.3d 1365, 1374 (Fed. Cir. 2005) (analyzing disclosure in the specification and highlighting the absence of additional evidence supporting asserted utility).

¹⁵³ *In re Brana*, 51 F.3d 1560, 1567 (Fed. Cir. 1995).

¹⁵⁴ *See In re Fisher*, 421 F.3d at 1378 (stating that “commercial success may support the utility of an invention”) (citing *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 959 (Fed. Cir. 1983)).

testimony, infringement, prior art, arguments, and analytical reasoning.¹⁵⁵ Thus, one of skill in the art might recognize the benefit, the benefit may be expressly disclosed in the patent application, or it may be shown later in various ways if utility is challenged.

Notably, besides using “practical” instead of “substantial,” the proposal uses both “specific” and “practical.” As shown above, the Supreme Court seemed to use the terms interchangeably. Likewise, Judge Rich thought “practical utility” meant “some specific use.” On the other hand, the Federal Circuit in *In re Fisher* treated “specific” and “substantial” as separate concepts.¹⁵⁶ According to the Federal Circuit, “to satisfy the ‘substantial’ utility requirement, an asserted use must show that that claimed invention has a significant and presently available benefit to the public.”¹⁵⁷ (Again, note the Federal Circuit indicated that “practical” utility is synonymous with “substantial” utility.¹⁵⁸) To satisfy the “specific” utility requirement, an asserted use must provide “a well-defined and particular benefit to the public.”¹⁵⁹ A better approach may be to use either “specific” or “practical” unless there is a desire to incorporate these two concepts into the definition. Or it may be better to use a phrase explaining more precisely what exactly is required, such as “an identifiable, presently available benefit” or the language from *In re Fisher*, such as “a well-defined and presently available benefit to the public.” In my view a complete combination of all of language from *In re Fisher* used to describe “substantial” and “specific” would probably be too wordy, and courts and patent examiners may place too much emphasis on the term “significant.”

Finally, while it does not use the term “operability,” I do not understand the proposal to eliminate the requirement of operability. Here is what I say about the operability aspect of the utility requirement in my casebook chapter:

In *Swartz*, the claimed process failed the operability requirement because there was substantial reason to doubt whether the inventor’s claimed results were reproducible. [*In re Swartz*, 232 F.3d 862, 864 (Fed. Cir. 2000).] Typically, the Federal Circuit has invoked lack of operability only in rare cases in which claims recite “impossible limitations,” *CFMT, Inc. v. YieldUp Int’l Corp.*, 349 F.3d 1333, 1339 (Fed. Cir. 2003), or make “nonsensical” assertions that would violate basic principles of physics such as the conservation of mass. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1359 (Fed. Cir. 1999). The Federal Circuit has explained that, to meet the operability requirement, the claimed product or process must be “capable of being used to effect the object proposed.” *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1180 (Fed. Cir. 1991) (quoting *Mitchell v. Tilghman*, 86 U.S. (19 Wall.) 287, 396 (1873)). Suppose that a claimed invention covers multiple disclosed embodiments, of which several are facially incredible while others are arguably more plausible. Is the operability criterion met? *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 762 (Fed. Cir. 1984) (calling for a showing of “total incapacity”); *CFMT, Inc.*, 349 F.3d at 1339; *Stiftung*, 945 F.2d at 1180 (sufficient

¹⁵⁵ *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1573 (Fed. Cir. 1992) (expert testimony); *Raytheon*, 724 F.2d at 959 (infringement); *Petito v. Puritan’s Pride, Inc.*, 35 F. Supp. 3d 494, 506-11 (S.D.N.Y. 2014) (prior art, arguments, and analytical reasoning).

¹⁵⁶ *In re Fisher*, 421 F.3d at 1371.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at 1371 n.4.

¹⁵⁹ *Id.* at 1371.

that the claimed invention meet one objective stated in the specification). Note how low this bar is; the claimed invention, simply put, must work. . . . The views of the Court of Claims in *Decca* are instructive: “The mere fact that the system has some drawbacks, or that under certain postulated conditions it may not work, or that better, more sophisticated, equipment has been developed which does a better job does not detract from the operability of the disclosed equipment to perform its described function.” *Decca Ltd. v. United States*, 544 F.2d 1070, 1077 (Ct. Cl. 1976). Likewise, “inoperativeness is not established merely by showing that the particular disclosed embodiment for carrying out the principles of the invention is lacking in perfection.” *Id.*¹⁶⁰

I do not understand that the current proposal seeks to change any of this law. Rather, I understand that operability is an inherent aspect of anything that has “specific and practical utility.” If there is a desire to make it absolutely clear that operability continues to be an aspect of the utility requirement, however, the term “operable” might be added to the definition.

The proposal’s approach—codifying courts’ interpretation of the utility requirement and eliminating the search for an “inventive concept”—would comport with the principles of broad eligibility, clarity, constraint on judicial intervention, and flexibility. First, eliminating the search for an “inventive application” in favor of a requirement of a practical application would certainly broaden eligibility as compared to the current law. While the interpretation of the practical utility requirement to require a “substantial” or “significant” benefit to the public would not appear to extend eligibility to inventions having “any” benefit to the public—such that operability is not all that is required to show a practical utility—courts’ application of this aspect of the utility requirement has not proven to be unduly stringent.¹⁶¹ Second, the law governing the requirement of a practical application has not proven to be unworkable; it is likely sufficiently clear.¹⁶² Third, to meet the principle of restraint on judicial intervention, the proposal not only articulates a standard focusing on practical utility but also includes additional language explaining that the “inventive application” test no longer applies. Fourth, a standard focusing on practical utility would provide a workable standard independent of technology areas and would, thus, be appropriate for application to new and unforeseen technologies.

c. “in any field of technology”

This part of the definition creates a technological field test. This is one of the most significant aspects of the proposal with respect to eligibility. It adopts a European-like test that is foreign to our traditional statutory scheme. If the practical application aspect of the utility

¹⁶⁰ David O. Taylor, *Utility*, in PATENT LAW: CASES AND MATERIALS, (Mark D. Janis ed., forthcoming), available at <http://ssrn.com/abstract=3398033>.

¹⁶¹ See, e.g., *In re Fisher*, 421 F.3d at 1371 (“Courts have used the labels ‘practical utility’ and ‘real world’ utility interchangeably in determining whether an invention offers a ‘substantial’ utility. Indeed, the Court of Customs and Patent Appeals stated that “‘practical utility’ is a shorthand way of attributing “real-world” value to claimed subject matter. In other words, one skilled in the art can use a claimed discovery in a manner which provides some *immediate benefit to the public*.’ It thus is clear that an application must show that an invention is useful to the public as disclosed in its current form, not that it may prove useful at some future date after further research. Simply put, to satisfy the ‘substantial’ utility requirement, an asserted use must show that that claimed invention has a significant and presently available benefit to the public.” (citation omitted)).

¹⁶² See *id.*

requirement is codified, and if the human effort aspect of the subject matter requirement is also codified, it is not clear what the purpose is for this additional limitation on eligibility. It might be interpreted to eliminate so-called business method claims.

Exactly what this part of the proposal would exclude, however, is not clear. Consider, for example, the Oxford English Dictionary's non-obsolete definitions of "technology":

4. a. The branch of knowledge dealing with the mechanical arts and applied sciences; the study of this.
b. The application of such knowledge for practical purposes, esp. in industry, manufacturing, etc.; the sphere of activity concerned with this; the mechanical arts and applied sciences collectively.
c. The product of such application; technological knowledge or know-how; a technological process, method, or technique. Also: machinery, equipment, etc., developed from the practical application of scientific and technical knowledge; an example of this. Also in extended use.
5. A particular practical or industrial art; a branch of the mechanical arts or applied sciences; a technological discipline.¹⁶³

These definitions focus on the "mechanical arts and applied sciences." Elsewhere the same dictionary defines "mechanical arts" as "skilled activities or occupations predominantly involving manual skills rather than mental ability; (in later use) such activities supported by the use of machines."¹⁶⁴ The dictionary also includes the following definition of "applied" that refers to "applied sciences": "Put to practical use; practical. Frequently in applied art (also applied arts), applied research, applied science (also applied sciences), applied technology."¹⁶⁵ It may not be clear to judges and patent examiners what these definitions distinguish. Some may use these definitions only to distinguish fine arts and unapplied science (such as pure mathematics). Others, however, will no doubt argue that "any field of technology" excludes more.

In short, this aspect of the proposal does not fare as well as other aspects of the proposal when considering the principles of broad eligibility, clarity, constraint on judicial intervention, and flexibility. It would seem to narrow eligibility. For example, in *Bilski v. Kappos* the Supreme Court concluded that the current statute does not exclude business methods from patentability.¹⁶⁶ The appropriate scope of eligibility, however, is certainly a matter of policy for Congress to decide and implement through the statute. The most significant concern with this aspect of the proposal, however, relates to clarity and constraint on judicial intervention. Patent examiners and judges will likely struggle to answer the question of what exactly is and is not a "field of technology," just like there is no clear demarcation between what is and is not a business method. These questions will provide significant room for litigation and discretion. While I have indicated before that a field of

¹⁶³ OED ONLINE (Oxford University Press March 2019) (definition of "technology"), available at <https://www.oed.com/view/Entry/198469?redirectedFrom=technology> & (accessed June 2, 2019).

¹⁶⁴ OED ONLINE (Oxford University Press March 2019) (under definition of "mechanical"), available at <https://www.oed.com/view/Entry/115544?redirectedFrom=mechanical> & (accessed June 2, 2019).

¹⁶⁵ OED ONLINE (Oxford University Press March 2019) (under definition of "applied"), available at <https://www.oed.com/view/Entry/9713?isAdvanced=false&result=1&rskey=qldLZe> & (accessed June 2, 2019).

¹⁶⁶ See *Bilski v. Kappos*, 561 U.S. 593, 606 (2010) ("Section 101 similarly precludes the broad contention that the term 'process' categorically excludes business methods.").

technology test is a possible option to reform patent eligibility law,¹⁶⁷ in my view it is not the best approach because it is highly dependent upon the appropriate use of discretion by patent examiners and judges. Finally, this aspect of the proposal does not fare very well on the principle of flexibility. It might be understood to be a standard that codifies what is currently viewed as a “field of technology.” Indeed, while it is fairly easy to distinguish between existing fields of technology (e.g., pharmaceuticals versus construction), it is much more difficult to identify what makes something qualify as a field of technology versus not.

d. “through human intervention.”

I understand this aspect of the proposal to codify an inherent aspect of what I call the subject matter requirement—the requirement that a claim describe one of the listed categories of eligible inventions: a process, machine, manufacture, or composition of matter. The primary function of the subject matter requirement is to eliminate from eligibility anything that is not the result of human effort.¹⁶⁸ In other words, for purposes of the subject matter requirement, eligibility extends to “anything under the sun that is made by man.”¹⁶⁹ Natural phenomena and natural laws are not eligible as such because they are not the result of human effort.¹⁷⁰ Given the Supreme Court’s confusion of this aspect of § 101 in *Mayo* and *Alice*, Congress would be reinjecting this original, appropriate understanding of the subject matter requirement into the patent statute.

The advantage of focusing on whether a claim describes something created by man can be demonstrated by using an old, celebrated case as an example of its application. In 1911, Judge Learned Hand decided that a claim to isolated and purified adrenaline describes eligible subject matter:

[E]ven if it were merely an extracted product without change, there is no rule that such products are not patentable. [The named inventor] was the first to make it available for any use by removing it from the other gland-tissue in which it was found, and, while it is of course possible logically to call this a purification of the principle, it became for every practical purpose a new thing commercially and therapeutically. That was a good ground for a patent.¹⁷¹

Judge Hand explained that a natural product, extracted from tissue without change, is eligible because of the human effort required to make it available for use. Stated otherwise, the decision rested on the recognition that *isolated* and *purified* adrenaline does not exist, as such, in nature.¹⁷² Isolated and purified adrenaline was the product of human effort; someone removed it from the

¹⁶⁷ David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149, 2214 n.267 (2017) (“If the conclusion is that [an alternative] approach does not appropriately treat [problematic] types of claims, the next step is to consider the addition of an appropriate, narrowly-tailored patentability requirement, such as a limitation on patents to “technological arts” or “technological fields of invention.”).

¹⁶⁸ See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 212 (2017).

¹⁶⁹ S. REP. NO. 82-1979 (1952), as reprinted in 1952 U.S.C.C.A.N. 2394, 2399.

¹⁷⁰ See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 214-15 (2017).

¹⁷¹ *Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 103 (C.C.S.D.N.Y. 1911), *aff’d in part, rev’d in part sub nom.* *Parke-Davis & Co v. H. K. Mulford & Co.*, 196 F. 496 (2d Cir. 1912).

¹⁷² See *Merck & Co. v. Olin Mathieson Chem. Corp.*, 253 F.2d 156, 163 (4th Cir. 1958). *But see Ex parte Latimer*, 1889 Dec. Comm’r Pat. 123.

gland-tissue in which it was found.

A test focusing on whether the claimed subject matter is the result of human effort may explain at least part of the Supreme Court’s recent decision in *Association for Molecular Pathology v. Myriad Genetics, Inc.*¹⁷³ With respect to the first set of claims at issue in the case, those involving isolated DNA sequences, the Court concluded that they were not eligible. In explaining its ruling, the Court highlighted that Myriad’s claims were not

saved by the fact that isolating DNA from the human genome severs chemical bonds and thereby creates a nonnaturally occurring molecule. Myriad’s claims are simply not expressed in terms of chemical composition, nor do they rely in any way on the chemical changes that result from the isolation of a particular section of DNA. Instead, the claims understandably focus on the genetic information encoded in the BRCA1 and BRCA2 genes.¹⁷⁴

In other words, according to the Court all Myriad claimed was the information stored in a particular DNA sequence; the information, as such, had already existed in nature. Had Myriad expressed its claims in terms of the chemical composition of the molecule that its inventors created—which included a severed chemical bond—the Court’s decision might have changed. Indeed, with respect to the second set of claims, those involving modified DNA called cDNA—which includes naturally-occurring “exons” but not naturally-occurring “introns”—the court explained its holding of eligibility based on the fact that a person had created something that did not exist in nature:

[T]he lab technician unquestionably creates something new when cDNA is made. cDNA retains the naturally occurring exons of DNA, but it is distinct from the DNA from which it was derived. As a result, cDNA is not a “product of nature” and is patent eligible under § 101, except insofar as very short series of DNA may have no intervening introns to remove when creating cDNA. In that situation, a short strand of cDNA may be indistinguishable from natural DNA.¹⁷⁵

Here the Court explained that the second set of claims identified something “distinct from the DNA from which it was derived” and thus was something “new.” It makes sense in this context that the Court focuses on human effort: “the *lab technician* . . . creates something new.”¹⁷⁶ What the lab technician creates is not a “product of nature” but instead, so to speak, a product of that lab technician’s effort. In other words, it is the result of human effort.

Where an analysis focusing on human effort differs from the Supreme Court’s recent approach to eligibility in *Mayo* and *Alice* is that *any* human contribution to the natural law or phenomena would meet the subject matter requirement. The Supreme Court, after *Alice* at least, requires the claim to include an “inventive concept,” which is something “significantly more” than the natural phenomena or natural law.¹⁷⁷ Rather than adopt Judge Hand’s focus solely on the

¹⁷³ *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013).

¹⁷⁴ *Id.* at 2118.

¹⁷⁵ *Id.* at 2119.

¹⁷⁶ *Id.* (emphasis added).

¹⁷⁷ *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012).

presence or absence of human effort, *Mayo* and *Alice* indicate that human effort alone is not enough. It is not enough, for example, if the human effort is “well-understood, routine, conventional activity previously engaged in by researchers in the field.”¹⁷⁸

In short, it is appropriate for Congress to insert into the patent statute language more clearly articulating the fundamental idea behind the subject matter requirement that eligible subject matter must be the result of human effort. This aspect of the proposal would set forth a standard for the USPTO and courts to apply that would be consistent with the principles of broad eligibility, clarity, constraint on judicial intervention, and flexibility. First, requiring human effort would not unduly constrain the breadth of eligibility. Any minimal human contribution to the claimed subject matter would render that subject matter eligible. Second, a requirement of human effort would provide a clear standard for the USPTO and courts to apply; either the claimed subject matter is the result of human effort or it is not. Third, to meet the principle of restraint on judicial intervention, the proposal not only articulates a standard focusing on practical utility but also includes additional language explaining that “inventive application” test no longer applies. Fourth, this approach would create a flexible standard applicable to new and unforeseen technologies. Regardless of the field of technology, currently existing or yet unimagined, to be eligible the subject matter would have to be the result of human effort.

I do suggest one possible modification of this language, however. “Through human intervention” may not clearly indicate whether inventions created using artificial intelligence (AI) would qualify as useful. If AI is treated like a research tool (e.g., a microscope or titration), such that the user of AI is still the inventor of any inventions suggested by the use of AI, then the user of AI presumably is entitled to a patent if he or she meets all the conditions and requirements of patentability. If this is the intention, then to make clear that AI-generated inventions are “useful” it might be better to use the phrase “as a result of human intervention.”

2. Section 101

- a. “Whoever invents or discovers any useful process, machine, manufacture, or composition of matter, or any useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”

All that is changed to Section 101 is the deletion of “new and.” This is helpful to clarify that novelty has no role in eligibility. History teaches that “new” in § 101 is redundant. Section 102 defines the requirement of newness in terms of comparing the claimed invention with prior art. The legislative history to the Patent Act of 1952 makes this clear. It explains that “[s]ection 102, in general, may be said to describe the statutory novelty required for patentability, and includes, in effect, an amplification and definition of ‘new’ in section 101.”¹⁷⁹ This is important

¹⁷⁸ *Id.* (“We find that the process claims at issue here do not satisfy these conditions. In particular, the steps in the claimed processes (apart from the natural laws themselves) involve well-understood, routine, conventional activity previously engaged in by researchers in the field.”).

¹⁷⁹ S. REP. NO. 82-1979, at 6 (1952), as reprinted in 1952 U.S.C.C.A.N. 2394, 2399. Beyond novelty, § 102 also sets forth the law governing what traditionally were known as statutory bars. See Daniel Taskalos, *Metallizing Engineering’s Forfeiture Doctrine After the America Invents Act*, 16 STAN. TECH. L. REV. 657, 661 (2013) (“Although the AIA completely redrafts the language of

because it highlights that “newness” or novelty of a claim, when comparing that claim to prior art at least, is not a relevant concern of any independent patentability requirement remaining in § 101.¹⁸⁰

- b. “Eligibility under this section shall be determined only while considering the claimed invention as a whole, without discounting or disregarding any claim limitation.”

This language, and particularly the last phrase, is a helpful clarification of current law. The current two-part test includes a first part that asks whether a claim is “directed to” an ineligible concept.¹⁸¹ Use of the term “directed” seemingly invites courts to ignore claim language. On the one hand, that, in fact, is what the Supreme Court and lower courts have done; if the claim language merely describes something conventional, then courts effectively ignore it.¹⁸² But the Supreme Court itself has said, on the other hand, that that is not what courts should do.¹⁸³ In *Diamond v. Diehr*, the Court held that:

In determining the eligibility of respondents’ claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps and a process may be patentable even though all of the constituents of the combination were well known and in common use before the combination was made. The “novelty” of any element or steps in the process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possible patentable subject matter.¹⁸⁴

There is great logic behind the idea that courts should not ignore claim language. While there is a fear that patent drafters will be able to draft claim language creatively to avoid a holding of invalidity based on ineligibility, that should be exactly what the system prefers. The point is to cause the patent drafter to draft the claim language so it describes something specific that may be compared to prior art and to any allegedly infringing product or service. Ignoring “conventional” claim limitations ignores the specific. But in *Mayo* and one of the cases it relied upon for this approach, *Parker v. Flook*, this is exactly what the Court has done, effectively ignore claim

the novelty provision, it maintains the same categories of available prior art references contained in the statutory bars subsection of the novelty provision.”)

¹⁸⁰ The Supreme Court shows its failure to understand this point—that “newness” or novelty of a claim, when comparing that claim to prior art at least, is not a relevant concern of any independent patentability requirement remaining in § 101—when it discounts existing or conventional acts in the context of its eligibility analysis. *See Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2357-58, 2359 (2014); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294, 1298 (2012).

¹⁸¹ *Alice*, 134 S. Ct. at 2355.

¹⁸² *See, e.g., id.* at 2359 (“Taking the claim elements separately, the function performed by the computer at each step of the process is ‘[p]urely conventional.’”) (quoting *Mayo*, 132 S. Ct. at 1298); *Versata Dev. Grp. v. SAP Am., Inc.*, 793 F.3d 1306, 1334 (Fed. Cir. 2015) (“Taking the claim limitations separately, the function performed by the computer at each step is purely conventional.”).

¹⁸³ *See Diamond v. Diehr*, 450 U.S. 175, 188-89 (1981).

¹⁸⁴ *Id.*

limitations.¹⁸⁵ While the Court has weakly denied that it is ignoring claim limitations,¹⁸⁶ it effectively is. In short, ignoring claim language is inappropriate, the Court’s precedent is inconsistent with respect to whether claim language may effectively be ignored, and, unfortunately, the current two-part test encourages the practice.

I do have one suggestion, however. There has long been discussion about whether there is any difference between these “element” and “limitation.” There is at least some basis to say there is a difference, because an element (such as the preamble to a claim) may not be limiting. To clarify that no part of a claim may be discounted or disregarded regardless of whether the language in question qualifies as a limitation on the scope of the claim, “any claim limitation” might be changed to “any part, limitation, element, or term of a claim,” or more simply “any part of a claim.”

3. Section 112

- a. “Functional Claim Elements — An element in a claim expressed as a specified function without the recital of structure, material, or acts in support thereof shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

I do not support the proposed amendment to Section 112(f). The proposed amendment overlooks the existing, working statutory doctrines that address the concern underlying the proposed amendment, and it is significantly overbroad.

As a preliminary matter, consider how the amendment would change existing law. Compared to the current statute, this aspect of the proposal first deletes “for a combination may be.” The old language was permissive, in terms of allowing the draftsman to do something. The new language omits any aspect of permission, which relates to the draftsman choosing to invoke 112(f) treatment. Compared to the current statute, this proposal also replaces “means or step for performing a specified function” with “specified function.” Again, this may eliminate the relevancy of the intent of the draftsman shown through the particular language used, including the phrase “means for.” Current law operates under a presumption standard based on presence or absence of “means for” or “step for.” This proposal would focus only on the underlying question of whether the language is functional. The existing presumption standard fits well with an intent-focused analysis. In the absence of the presumption, this new analysis appears to be more difficult to determine when to require Section 112(f) treatment.

In this regard, this proposal goes even further than recent case law (*Williamson v. Citrix Online*)¹⁸⁷ to change the approach to functional language. As I have mentioned, the law is now focused on the intent of the draftsman to invoke 112(f). This proposal focuses on the effect of

¹⁸⁵ See *Mayo*, 132 S. Ct. at 1289; *Parker v. Flook*, 437 U.S. 584 (1978).

¹⁸⁶ See *Alice*, 134 S. Ct. at 2355 n.3 (“Because the approach we made explicit in *Mayo* considers all claim elements, both individually and in combination, it is consistent with the general rule that patent claims ‘must be considered as a whole.’”) (quoting *Diehr*, 450 U.S. at 188); *Flook*, 437 U.S. at 594 (“Our approach to respondent’s application is, however, not at all inconsistent with the view that a patent claim must be considered as a whole.”). The attempt in *Alice* to reconcile *Flook*, *Diehr*, and *Mayo* is unpersuasive; the better approach, anyway, is *not* to ignore claim language. The law should foreclose this possibility clearly.

¹⁸⁷ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc).

what is drafted, not the intent of the draftsman as shown primarily through use of the phrase “means for.” This direction is where *Williamson v. Citrix Online* started going, and the best critique of that approach is Judge Newman’s dissent in that case. There she explains the basis for her overall view that “eliminating the statutory signal of the word ‘means’” creates “additional uncertainty of the patent grant, confusion in its interpretation, invitation to litigation, and disincentive to patent-based innovation.”¹⁸⁸

Beyond Judge Newman’s critique of abandoning an analysis focused on the intent of the draftsman, I have two primary concerns related to this aspect of the proposal. First, this aspect of the proposal is significantly overbroad with the potential for far reaching negative ramifications. My understanding is that the proposed amendment to Section 112(f) seeks to address concerns with generic computer language. It appears to rest upon concerns with the breadth of claims as well as potential vagueness and abstractness, particularly with respect to claims to software algorithms. But this proposal covers every single patent element of every single patent, rather than just those parts of claims that use computer language. It therefore could cause a sea change with broad, significant ramifications in other areas, including life sciences. In short, depending upon how it is interpreted, this proposal might significantly constrain the breadth of all claims, substantially reduce the value of all patents given their narrower scope, greatly increase the costs of drafting all patents by requiring encyclopedic disclosures with respect to every part of every claim regardless of the knowledge of persons of ordinary skill in the art, and ultimately (as a result) lead to reduced investment in inventive efforts.

Second, this aspect of the proposal is unnecessary. Section 112 (along with other aspects of the existing statute) already addresses the concerns with claim breadth, vagueness, or abstractness.

Consider claim breadth. The amendment to Section 112(f) is not necessary because the written description and enablement requirements already significantly constrain the breadth of claims.

The written description requirement mandates that the specification of a patent clearly allow someone of ordinary skill in the art to recognize that the inventor invented what is claimed.¹⁸⁹ In other words, the specification must convey to one of ordinary skill that the inventor “had possession of the claimed subject matter as of the filing date,” where possession refers to “possession as shown in the disclosure.”¹⁹⁰ With respect to “genus” or “generic” claims in particular, compliance with the written description requirement may be made in two ways: possession may be shown through the disclosure of example species of the claimed genus, or through the disclosure of structural features common to members of the genus.¹⁹¹ Moreover, the law includes a set of objective guidelines for making a determination of whether a claim to a genus meets the written

¹⁸⁸ *Id.* at 1358 (Newman, J., dissenting).

¹⁸⁹ *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1340 (Fed. Cir. 2010) (en banc) (reaffirming that the first paragraph of § 112 contains a written description requirement separate from the enablement requirement).

¹⁹⁰ *Id.* at 1351.

¹⁹¹ *Id.* at 1352.

description requirement.¹⁹² These guidelines include identifying the existing knowledge in the particular field, the extent and content of the prior art, the maturity of the science or technology, and the predictability of the aspect at issue.¹⁹³ Thus, the law governing the written description requirement provides for objective inquiries that help make the determination of compliance reasonably ascertainable.

In turn, the enablement requirement mandates that the specification describe the “manner and process of making and using [the claimed invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.”¹⁹⁴ As applied by the Federal Circuit, the enablement requirement ensures that the specification includes sufficient disclosure to enable one of ordinary skill in the art to practice the claimed invention “without undue experimentation.”¹⁹⁵ If there is evidence that some experimentation is needed to practice the claimed invention, the court refers to a set of objective guidelines or “factual considerations” to determine “whether the amount of that experimentation is either ‘undue’ or sufficiently routine such that an ordinarily skilled artisan would reasonably be expected to carry it out.”¹⁹⁶ These factual considerations include

- (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.¹⁹⁷

Yet again, the objective nature of these factual considerations allows for reasonable certainty with respect to the outcome of the analysis.

These aspects of the enablement and written description requirements have a firm historical foundation. Indeed, one example of how the written description and enablement requirements of § 112 constrain the ability of claims to cover after-arising technologies is *O’Reilly v. Morse*, where the Supreme Court invalidated a claim precisely because the specification, while disclosing an embodiment of the invention that could have been built at the time the application was filed, claimed rights that would have covered an after-arising technology.¹⁹⁸ In this regard, it is important to recognize that *O’Reilly v. Morse* is a case regarding the enablement and written description

¹⁹² *Id.* at 1351 (“For generic claims, we have set forth a number of factors for evaluating the adequacy of the disclosure, including ‘the existing knowledge in the particular field, the extent and content of the prior art, the maturity of the science or technology, [and] the predictability of the aspect at issue.’”) (quoting *Capon v. Eshhar*, 418 F.3d 1349, 1359 (Fed. Cir. 2005)).

¹⁹³ *Id.*

¹⁹⁴ 35 U.S.C. § 112(a) (2012).

¹⁹⁵ *Alcon Research Ltd. v. Barr Labs., Inc.*, 745 F.3d 1180, 1188 (Fed. Cir. 2014) (quoting *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1360 (Fed. Cir. 1998)).

¹⁹⁶ *Id.* (quoting *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988)).

¹⁹⁷ *In re Wands*, 858 F.2d at 737 (citing *In re Forman*, 230 U.S.P.Q. 546, 547 (B.P.A.I. 1986)).

¹⁹⁸ *O’Reilly v. Morse*, 56 U.S. 62 (1853).

requirements and not the eligibility requirement. There has been much confusion on this point both by courts¹⁹⁹ and in the secondary literature.²⁰⁰

The Supreme Court decided *O'Reilly v. Morse* in 1854 pursuant to the Patent Act of 1836, which the Court summarized in part as requiring

a written description of [the] invention or discovery, “and of the manner and process of making, constructing, using, and compounding the same,” in such exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same.²⁰¹

This initial explanation of the governing law, which described the written description and enablement requirements, is important to consider in the context of the courts’ later explanation of its decision. Indeed, it points in the direction of the basis for the Court’s holding.

Samuel Morse, the inventor of the telegraph, obtained a patent on his invention in 1840.²⁰² The parties in this case disputed the validity of the eighth claim in his patent.²⁰³ That claim recited “the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing intelligible characters, signs, or letters at a distance.”²⁰⁴ The Court found Claim 8 invalid given its breadth.²⁰⁵ In the words of the Court, “If this claim can be maintained, it matters not by what process or machinery the result is accomplished.”²⁰⁶

In reaching its conclusion of invalidity, the Court focused on various policies: The prevention of other inventors from making improvements; the ability of Morse to alone make improvements but keep those from the public because of the lack of a need to disclose in a patent application; the idea that the inventor is only entitled to the process or machine disclosed; and the absurdity of past inventors obtaining similar rights, for example Fulton obtaining a right to use steam to propel vessels.²⁰⁷ But, as shown below, the Court ultimately faulted Morse for *failing to disclose in his specification the process or machinery to achieve the claimed result*; in other words, the claim failed the *enablement and written description requirements*.

The Court faulted Morse for claiming a cause and result rather than the disclosed process or machine.²⁰⁸ The Court explained that the problem with Morse’s Claim 8 was that, “[f]or aught

¹⁹⁹ See, e.g., *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 809 F.3d 1282, 1287-93 (Fed. Cir. 2015) (Dyk, J., concurring in the denial of en banc rehearing) (discussing *O'Reilly v. Morse* in the context of patent eligibility rather than the enablement or written description requirement).

²⁰⁰ See, e.g., Joshua A. Kresh, *Patent Eligibility After Mayo: How Did We Get Here and Where Do We Go?*, 22 FED. CIR. B.J. 521, 523 (2013) (discussing *O'Reilly v. Morse* in the context of patent eligibility rather than the enablement or written description requirement). See generally Adam Mossoff, *O'Reilly v. Morse* (Geo. Mason L. & Econ. Research, Paper No. 14-22, Aug. 18, 2014), <http://ssrn.com/abstract=2448363> (describing this dispute among scholars and citing additional examples).

²⁰¹ *Morse*, 56 U.S. at 118. The quoted language is the predecessor to the modern written description and enablement requirements in § 112. See 35 U.S.C. § 112(a) (2012).

²⁰² *Morse*, 56 U.S. at 62.

²⁰³ *Id.* at 62-63.

²⁰⁴ *Id.* at 112.

²⁰⁵ *Id.* at 62-63.

²⁰⁶ *Id.* at 113.

²⁰⁷ *Id.* at 113-14.

²⁰⁸ *Id.* at 109.

that we now know some future inventor . . . may discover a mode of writing or printing at a distance by means of the electric or galvanic current, *without using any part of the process or combination set forth in the plaintiff's specification.*"²⁰⁹ Likewise, it faulted Morse for failing to "confine his claim to the machinery or parts of machinery, *which he specifies.*"²¹⁰ And the Court found trouble with Morse's claim to "an exclusive right to use a manner and process which he *has not described* and indeed *had not invented*, and therefore *could not describe* when he obtained his patent."²¹¹ Again and again, the Court focused on comparing the scope of the claim to the scope of the disclosure in Morse's patent application to see whether the claimed invention was described and specified.²¹² It is in this context that the Court concluded that it was "of [the] opinion that the claim is too broad, and not warranted by law."²¹³

Thus, in modern terms, it is quite clear that the problem with Claim 8 in Morse's patent was based on the enablement and written description requirements located in § 112(a). To use today's terminology, the specification did not contain a written description of the invention or enable one of skill in the art to make and use what was described in Claim 8 without undue experimentation.²¹⁴ In particular, Morse's specification did not provide sufficient information to show he had possession of the invention, let alone to empower someone to make every possible device that could use electromagnetism to print at a distance, which, as a dramatic indicator of the breadth of Morse's claim, would include the Internet. This case highlights the important role of the enablement and written description requirements to constrain claim breadth.²¹⁵

More recent case law supports the same point, expressly describing how the enablement and written description requirements prevent these claims. In *LizardTech, Inc. v. Earth Resource Mapping Inc.*, for example, the Federal Circuit explained that a specification's "description of one method for creating a [device] does not entitle the inventor . . . to claim any and all means for achieving that objective."²¹⁶ The court continued:

²⁰⁹ *Id.* at 113 (emphasis added).

²¹⁰ *Id.* (emphasis added).

²¹¹ *Id.* (emphases added).

²¹² *Id.* at 112-20.

²¹³ *Id.* at 113.

²¹⁴ See *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) (en banc) (discussing the enablement and written description requirement using these terms).

²¹⁵ See, e.g., CRAIG ALLEN NARD, *THE LAW OF PATENTS* 92 (Aspen, 3d ed. 2014) (placing *O'Reilly v. Moore* in the chapter related to the enablement requirement); *In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983) (explaining that in *O'Reilly v. Morse* "the claim is properly rejected for what used to be known as 'undue breadth,' but has since been appreciated as being, more accurately, based on the first paragraph of § 112"). In the course of its opinion in *O'Reilly v. Morse*, the Court did state that "the discovery of a principle in natural philosophy or physical science, is not patentable." *Morse*, 56 U.S. at 116. It said so, however, with respect to another case (*Neilson v. Harford*), in the course of *distinguishing* that case and, in particular, while presenting a counterfactual representation of the holding in that case. *Id.* ("And if this had been the construction, the court, it appears, would have held his patent to be void; because the discovery of a principle in natural philosophy or physical science, is not patentable."); *id.* at 116-17 ("For Neilson discovered, that by interposing a heated receptacle between the blower and the furnace, and conducting the current of air through it, the heat in the furnace was increased. And this effect was always produced, whatever might be the form of the receptacle, or the mechanical contrivances for heating it, or for passing the current of air through it, and into the furnace. But Professor Morse has not discovered, that the electric or galvanic current will always print at a distance, no matter what may be the form of the machinery or mechanical contrivances through which it passes."). In other words, while *Neilson v. Harford* may have been decided based on one aspect of the law governing patent eligibility, *O'Reilly v. Morse* was not.

²¹⁶ *LizardTech, Inc. v. Earth Resource Mapping Inc.*, 424 F.3d 1336, 1346 (Fed. Cir. 2005).

The single embodiment would support such a generic claim only if the specification would “reasonably convey to a person skilled in the art that [the inventor] had possession of the claimed subject matter at the time of filing,” . . . and would “enable one of ordinary skill to practice ‘the full scope of the claimed invention.’”²¹⁷

In this way, the court explained that both the enablement and written description requirements are not met where a claim is supported only by one or a limited number of embodiments and, as a result, one of skill in the art would not be able to recognize from the description either: (1) how to make and use the full scope of the claimed invention or (2) that the applicant or named inventor had possession of the full scope of the claimed invention.²¹⁸

Consider next the concern with claim vagueness and the related concern of abstractness. The existing utility, written description, and definiteness requirements, as well as the existing statutory limit on functional claiming, already address these concerns. And the law that has developed around those doctrines have objective guidelines to provide meaningful direction to patent examiners and courts.

I have already discussed the written description, enablement, and utility requirements. Those doctrines, taken as a whole, also address the problem of vagueness and abstractness. The written description requirement ensures that a claim describes what an inventor actually invented, rather than some abstraction of what was invented, by mandating that a patent’s specification clearly allow someone of ordinary skill in the art to recognize that the inventor invented what is claimed.²¹⁹ By mandating that the specification describe the “manner and process of making and using [the claimed invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same,”²²⁰ the enablement requirement ensures that a claim describes something specific that is reproducible rather than some abstraction. And by mandating that a claimed invention have substantial, practical, and immediate usefulness,²²¹ the utility requirement ensures that a claimed invention has a presently available, specific utility rather than some abstract notion of how the claimed invention might be useful in the future.

Also consider the definiteness requirement. By ensuring that claims are reasonably certain,²²² the definiteness requirement ensures that a claim is not vague. While it may be true that, standing alone, the definiteness requirement cannot invalidate abstract claims—because the

²¹⁷ *Id.* at 1346 (citations omitted) (quoting *Bilstad v. Wakalopoulos*, 386 F.3d 1116, 1125 (Fed. Cir. 2004), and *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1253 (Fed. Cir. 2004)). The court explained that, “[a]fter reading the patent, a person of skill in the art would not understand how to make [the device] generically and would not understand LizardTech to have invented a method for making [the device], except by” the particular method disclosed. *Id.* at 1345.

²¹⁸ *Id.* at 1346.

²¹⁹ See *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1340 (Fed. Cir. 2010) (en banc) (reaffirming that § 112, first paragraph, contains a written description requirement separate from the enablement requirement).

²²⁰ 35 U.S.C. § 112(a) (2012).

²²¹ See *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966) (“The basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point—where specific benefit exists in currently available form—there is insufficient justification for permitting an applicant to engross what may prove to be a broad field.”).

²²² *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (“[W]e hold that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”).

definiteness requirement “asks whether a person having ordinary skill in the art (PHOSITA) could understand the claims, regardless of how abstract or applied they might be”²²³—it does help ensure that claims are clear so that it is possible to determine their scope. Beyond eliminating vagueness (which really is one type of abstractness), therefore, the definiteness requirement serves an important helping function; only when a patent examiner or court can determine the scope of a claim can it determine whether that scope is supported by a disclosure in the specification that meets the written description, enablement, and utility requirements, which as discussed above are the statutory doctrines that prevent claims from covering mere abstractions.

But there is more. Yet another doctrine that reins in claim abstraction is the existing statutory limit on functional claiming expressed in § 112(f).²²⁴ It allows for an element in a claim to be expressed in functional language (“as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof”), but limits the construction of this language “to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”²²⁵ Thus, while one might express a claim in terms of a result, the claim must be interpreted to be limited to the way to achieve that result that is identified in the specification (and its equivalents). Section 112(f) therefore already works to limit claims to specific embodiments or applications rather than abstract ideas.

In short, the statutory doctrines found in §§ 101, 103, and 112—written description, enablement, utility, definiteness, the limitation on functional claiming, and non-obviousness—already do the work of prohibiting the patenting of vague or abstract ideas. Moreover, they do so using doctrines rooted in the patent statute that have well-developed objective tests.²²⁶

Focusing back on the original concern with generic computer language in particular, I encourage the subcommittee to consider the current state of the law on point. It has long been the law that inadequate disclosure of algorithms to support functional language results in violation of the written description, enablement, definiteness, and functional claiming requirements.

²²³ See Mark A. Lemley, Michael Risch, Ted Sichelman & R. Polk Wagner, *Life After Bilski*, 63 STAN. L. REV. 1315, 1331 (2011).

²²⁴ 35 U.S.C. § 112(f) (2012).

²²⁵ *Id.*

²²⁶ The actual concern underlying the prohibition on patenting “abstract ideas” might be one with claims covering non-technological inventions. This may have been Justice Stevens’s concern in *Bilski*, although he did not cloak his concern under the guise of prohibiting abstract ideas. See *Bilski v. Kappos*, 561 U.S. 593, 614 (2010) (Stevens, J., concurring) (“Rather than making any broad statements about how to define the term ‘process’ in § 101 or tinkering with the bounds of the category of unpatentable, abstract ideas, I would restore patent law to its historical and constitutional moorings. For centuries, it was considered well established that a series of steps for conducting business was not, in itself, patentable.”). This concern explains the Federal Circuit’s use of the prohibition on patenting abstract ideas to affirm rejections of claims in some recent cases. See, e.g., *In re Smith*, 815 F.3d 816, 818 (Fed. Cir. 2016) (“[W]e conclude that Applicants’ claims, directed to rules for conducting a wagering game, compare to other ‘fundamental economic practice[s]’ found abstract by the Supreme Court.”); *Planet Bingo, LLC v. VKGS LLC*, 576 F. App’x 1005, 1008 (Fed. Cir. 2014) (affirming the rejection of “claims . . . directed to the abstract idea of ‘solv[ing a] tampering problem and also minimiz[ing] other security risks’ during bingo ticket purchases”). And it provides a basis to reject claims to a diaper service, Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 383-94 (1960), reprinted in 14 FED. CIR. B.J. 135 (2004), a method of shooting a free throw, or a purely mental process. These claims are not really abstract but instead likely would be found to cover non-technological inventions.

Consider, as another example, the indefiniteness analysis in *In re Katz Interactive Call Processing Patent Litigation*.²²⁷ In that case the Federal Circuit invalidated some Katz's claims that included functional language because there was inadequate supporting disclosure in the relevant patents' specifications:

Computers can be programmed to conditionally couple calls in many ways. Without any disclosure as to the way Katz's invention conditionally couples calls, the public is left to guess whether the claims cover only coupling based on particular system conditions, such as the availability of an operator, or are broad enough to cover any coupling in conjunction with an if-then statement in source code. Katz's claims therefore fail to fulfill the public notice function of 35 U.S.C. § 112 ¶ 2 by "particularly pointing out and distinctly claiming" the invention. And by claiming a processor programmed to perform a specialized function without disclosing the internal structure of that processor in the form of an algorithm, Katz's claims exhibit the overbreadth inherent in open-ended functional claims in violation of the limits Congress placed on means-plus-function claims in section 112, paragraph 6. Because of the absence of the requisite structure, we affirm the district court's indefiniteness ruling as to claims 21 and 33 of the '551 patent and claim 13 of the '065 patent.²²⁸

On the other hand, the court also refused to invalidate other claims that included functional language because persons of ordinary skill in the art would have readily understood how to use those functions; indeed, the functions could be used by any general purpose computer without any special programming, and so no disclosure of special programming was required:

The [district] court interpreted [the Federal Circuit's] cases to require that "the specification . . . disclose an algorithm for [any] recited function" that is performed solely or predominantly by a general purpose computer. The appellees characterize that rule as applying to any function that is "linked" to a general purpose computer. But that interpretation of our prior cases is too broad. Those cases involved specific functions that would need to be implemented by programming a general purpose computer to convert it into a special purpose computer capable of performing those specified functions. By contrast, in the seven claims identified above, Katz has not claimed a specific function performed by a special purpose computer, but has simply recited the claimed functions of "processing," "receiving," and "storing." Absent a possible narrower construction of the terms "processing," "receiving," and "storing," discussed below, those functions can be achieved by any general purpose computer without special programming. As such, it was not necessary to disclose more structure than the general purpose processor that performs those functions. Those seven claims do not run afoul of the rule against purely functional claiming,

²²⁷ *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1315 (Fed. Cir. 2011).

²²⁸ *Id.* (quotation marks, citations, and footnote omitted).

because the functions of “processing,” “receiving,” and “storing” are coextensive with the structure disclosed, i.e., a general purpose processor.²²⁹

In short, existing law already addresses the concerns with functional claim language, particularly in the realm of computer algorithms. Moreover, it already does so in a balanced way that provides certainty and correct results in particular cases.

Given that existing law already addresses the relevant concerns, no amendment to the patent statute is necessary. If anything, Congress might only codify existing law or clarify how the existing law applies in the context of generic computer language. For example, consistent with *Morse* and the idea underlying *In re Katz Interactive Call Processing Patent Litigation*, Congress might leave the existing Section 112(f) language as is and instead add a provision for generic computer language to Section 112(a): “Notwithstanding the forgoing, the disclosure of generic computer hardware shall not alone satisfy the requirements of this subsection unless the person skilled in the art would know how to make and use the claimed invention using the computer hardware without undue experimentation.” This would be a more targeted approach, it would allow the analysis to focus on whether the disclosure of the patent supports the breadth of the claim, and it would clarify how the existing law applies in the context of generic computer language. As discussed, the concerns with functional language have related to claim breadth, vagueness, and abstractness, and the existing statutory doctrines already address those concerns.

4. Additional Legislative Provisions

I note one concern common to all of the additional legislative provisions. Given that some judges do not consider or rely upon legislative history when interpreting and applying statutory language, I would be concerned if these provisions were not enacted. In other words, in my view these legislative provisions ought to be enacted as part of the legislation itself, even if these provisions will remain uncodified in the sense of not forming part of the language in Title 35 of the U.S. Code.

- a. “The provisions of section 101 shall be construed in favor of eligibility.”

This aspect of the proposal is helpful. What it seems to mean is that in close cases patent examiners and judges should find eligibility. This approach makes sense given that it will encourage patent examiners and judges to seek broad eligibility, which supports robust investment in research and development.

- b. “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

²²⁹ *Id.* at 1316 (citations and footnote omitted) (citing *Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333-34 (Fed. Cir. 2008); *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1253 (Fed. Cir. 2005); *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999)).

section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated.”

This aspect of the proposal would “lay the ghost” of the non-statutory exceptions to eligibility.²³⁰ In other words, Congress would expressly eliminate the non-statutory eligibility requirements. The relevant policy concerns would instead be addressed by the patentability and specification requirements actually expressed in the patent statute.²³¹ Michael Risch, for example, has advocated for “rigorous application” of the existing patentability and specification requirements in §§ 102, 103, and 112 rather than application of enforcement of “unclear and undefined subject matter rules based on unsupportable statutory interpretations” of § 101.²³²

If Congress eliminated the non-statutory exceptions, and in particular the misguided search for an “inventive application,” it would be similar to the approach taken in the Patent Act of 1952, when Congress eliminated the separate “invention” requirement in favor of the non-obviousness requirement.²³³ The drafters of the Patent Act of 1952 deliberately omitted any reference to the “invention” requirement to “free the law and lawyers from bondage to that old and meaningless

²³⁰ The concept of eliminating the non-statutory exceptions to eligibility resemble the effort by Judge Rich to eliminate the so-called “invention” requirement in the Patent Act of 1952. See Giles S. Rich & Paul R. Michel, *Laying the Ghost of the “Invention” Requirement*, 1 APLA Q.J. 26 (1972-1973), reprinted in 41 AIPLA Q.J. 1, 2-5 (2013).

²³¹ Even without a legislative amendment to eliminate the non-statutory exceptions, there is an argument that § 101 is not a “condition of patentability” and therefore failure to comply with it is not a proper defense in litigation, even if it is enforceable by the USPTO during the original examination of a patent. This position has been advanced by at least one patent law professor. See David Hricik, *Why Section 101 Is Neither a “Condition of Patentability” nor an Invalidity Defense*, PATENTLYO BLOG (Sept. 16, 2013), <http://patentlyo.com/hricik/2013/09/why-section-101-is-neither-a-condition-of-patentability-nor-an-invalidity-defense.html>. To the extent this position is correct and yet the relevant underlying policy concerns should be considered not just in front of the USPTO but also during litigation, one solution is to focus on the relevant inquiries using the traditional inquiries under §§ 102, 103, and 112. Indeed, those other sections of the patent statute already address those policy concerns and provide administrable tests. See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 212-21 (2017).

²³² Michael Risch, *Everything is Patentable*, 75 TENN. L. REV. 591, 606-07 (2008) (“Attention to rigorous application of the patentability standards would replace unclear and undefined subject matter rules based on unsupportable statutory interpretations of the Patent Act.”). But see Mark A. Lemley et al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1327 (2011) (“One of us has gone so far as to argue that the best solution is to abandon all exceptions, including the historical ones. Whether or not this approach is correct, it is unlikely to gain judicial support in light of *Bilski*. Therefore, we take the common law abstract ideas exception as a given, and seek to articulate a reason to preclude patentability for abstract ideas and a corresponding way to recognize when patent claims are too abstract.”). The Supreme Court relied upon “Risch’s change of mind,” reflected in a comparison of the views expressed in his articles *Everything is Patentable* and *Life after Bilski*, to support its view that the written description and enablement requirements of § 112 will not meet “the risk that a patent on [a law of nature] would significantly impede future innovation.” *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1304 (2012). I have explained elsewhere why I believe the Supreme Court and Risch are wrong on the issue of whether the written description and enablement requirements work to eliminate the risk of patent claims impeding future innovation. See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 199-203 (2017).

²³³ As explained in the Senate and House Reports associated with the Patent Act of 1952:

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 court. 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 large variety of ways in decisions of the courts and in writing. Section 103 states this requirement in the title. It refers to the difference between the subject matter sought to be patented and the prior art, meaning what was known before as described in section 102. If this difference is such that the subject matter as a whole would have been obvious at the time to a person skilled in the art, then the subject matter cannot be patented. 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.

S. REP. NO. 82-1979 (1952), as reprinted in 1952 U.S.C.C.A.N. 2394, 2399-400. The Senate Report duplicates the relevant text from the House Report.

term.”²³⁴ In its place, they created the non-obviousness requirement of § 103. As a result, “[a]n examination of the presence or absence of ‘invention’ or of precedents on that muddied issue is not called for”²³⁵ The reason the drafters eliminated the common law “invention” requirement in favor of the statutory non-obviousness requirement was to put in place an administrable test, one with objectively-determinable components to the analysis.²³⁶

Likewise, to correct the problems with the modern eligibility requirement, Congress would solve much of the problems with the law by eliminating the non-statutory eligibility requirements in favor of the patentability and specification requirements included in the remainder of the patent statute. And, as proposed, at the same time, Congress may consider drafting more clear language in the remainder of the patent statute to address any policy concerns not already addressed by the remaining patentability and specification requirements.²³⁷

This approach would ensure consideration of whether the patentability and specification requirements in §§ 102, 103, and 112 do all of the work necessary to eliminate the patenting of unworthy claims. These patentability and specification requirements do already address many of the relevant policy concerns upon which the Supreme Court has focused in its cases on eligibility.²³⁸ The elimination of the “implicit exceptions” would therefore eliminate unnecessary overlap. Moreover, it would increase the administrability of the patent statute; it would eliminate a non-statutory, purely subjective evaluation of patentability in favor of statutory approaches with objective constraints.

This approach—eliminating at least the “implicit exceptions” in favor of addressing the relevant policy concerns in the statutory doctrines expressed in §§ 101, 102, 103, and 112—would, in effect, be a codification of the best form of the patentability and specification patent law doctrines necessary to ensure that only deserving patents issue. Depending upon its implementation, this approach would be consistent with the principles of broad eligibility, clarity, constraint on judicial intervention, and flexibility. First, the elimination of the “implicit exceptions” that have given rise to the question of whether the claimed invention includes an “inventive concept,” would ensure broad eligibility. Second, the elimination of duplicative standards would, in and of itself, increase clarity with respect to the patent statute. Of course, any amendment to the existing patentability and specification requirements, such as to § 112, need to be clear. Third, to ensure that the judiciary does not import into the analyses required by those remaining statutory sections its misguided common law regarding the displaced “implicit

²³⁴ Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393 (1960), reprinted in 14 FED. CIR. B.J. 135, 145 (2004).

²³⁵ Giles S. Rich, *The Vague Concept of “Invention” as Replaced by § 103 of the 1952 Patent Act*, 46 J. PAT. OFF. SOC’Y 855, 866 (1964), reprinted in 14 FED. CIR. B.J. 147, 158 (2004).

²³⁶ See Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393 (1960), reprinted in 14 FED. CIR. B.J. 135, 146 (2004) (“There is a vast difference between basing a decision on exercise of the inventive or creative faculty, or genius, ingenuity, patentable novelty, flashes, surprises and excitement, on the one hand, and basing it on unobviousness to one of ordinary skill in the art on the other. It is possible to determine what art is involved, what type of skill is possessed by ordinary workers in it, and come to some conclusion as to what ‘ordinary skill’ would be at a given time.”).

²³⁷ This approach, in particular, would require advocates on both sides of the debate over eligible subject matter to consider whether the existing patentability and specification requirements outside of § 101 appropriately deal with subject matter that might be most problematic, such as a method of shooting a free throw or a method of singing an opera. All approaches, however, ought to be analyzed to consider whether they appropriately treat the most problematic types of claims. If the conclusion is that the approach does not appropriately treat these types of claims, the next step is to consider the addition of an appropriate, narrowly-tailored patentability requirement, such as a limitation on patents to “technological arts” or “technological fields of invention.”

²³⁸ See David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 212-21 (2017).

exceptions,” it is probably necessary to include this type of clear statement in the legislation, or even in the amended statute, that the “implicit exceptions” have been eliminated in favor of statutory patentability and specification requirements in §§ 101, 102, 103, and 112. Fourth, this approach would revolve around expressing generally applicable governing standards that would apply going forward to future technologies and, thus, satisfy the need for flexibility.

5. Additional Concerns

Here I identify a few concerns not addressed in the current proposal.

a. The Weldon Amendment

The proposal does not address the so-called Weldon Amendment, which for many years formed part of the annual appropriation legislation providing funds to support the operation of the U.S. Patent and Trademark Office.²³⁹ Most recently President Obama and Congress enacted the Weldon Amendment in Section 33 of the Leahy-Smith America Invents Act of 2011. This provision states that, “[n]otwithstanding any other provision of law, no patent may issue on a claim directed to or encompassing a human organism.”²⁴⁰

Any legislative reform should not overlook the Weldon Amendment. Indeed, any proposed reform to patent eligibility law provides the opportunity to consider whether morality or ethics provide any basis to exclude subject matter from the realm of patent law and the right to exclude. Any moral or ethical concerns with patenting should be governed by express limitations on patent eligibility introduced through legislation enacted by Congress and the President, rather than through judicial or agency processes. At a minimum, Congress should consider whether any legislation would overturn the Weldon Amendment. I do not understand the current proposal to overturn it. Congress could seek to make that more clear.

b. Effective Date

Whatever its exact content, any legislation ought to clarify whether it is retroactive or only prospective. It seems likely that most patents still in force today were filed and issued under eligibility law as it existed prior to *Mayo* and *Alice*. Given that the amendments to Sections 100 and 101—at least to the extent they would define useful as “specific and practical” utility—would codify the longstanding understanding of the law as it existed prior to *Mayo* and *Alice*, serious thought should be given to making the amendment retroactive at least to patent applications already filed and issued patents still in force. This approach would likely comport with governing law. As explained by the Supreme Court:

Congress, of course, has the power to amend a statute that it believes we have misconstrued. It may even, within broad constitutional bounds, make such a change retroactive and thereby undo what it perceives to be the undesirable past

²³⁹ 157 Cong. Rec. E1185 (daily ed. June 23, 2011) (“The Weldon Amendment is contained in the annual Commerce, Justice and Science Appropriations bills (CJS) and prevents the patenting of humans. Congress has passed it each year since 2004 . . .”).

²⁴⁰ Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 33(a), 125 Stat. 284 (2011) (“Notwithstanding any other provision of law, no patent may issue on a claim directed to or encompassing a human organism.”).

consequences of a misinterpretation of its work product. No such change, however, has the force of law unless it is implemented through legislation. Even when Congress intends to supersede a rule of law embodied in one of our decisions with what it views as a better rule established in earlier decisions, its intent to reach conduct preceding the “corrective” amendment must clearly appear.²⁴¹

In short, any retroactive application of a so-called restorative statute must be clear and stated in the legislation itself (not just the legislative history).

V. The Path Forward

In the last part of my written statement I want to encourage the subcommittee in its proposed approach to the doctrine of patent eligibility. In my article *Patent Reform, Then and Now*, I highlight the stark similarities between the patent reform effort of 1952 to eliminate the “invention” requirement and the effort now to eliminate the “inventive concept” requirement. By embracing the utility requirement’s focus on a “practical benefit” as opposed to an “inventive concept,” the current proposal adopts an approach I identify as central to the success of the patent reform effort of 1952: the adoption of a prior judicial standard. In short,

reformists need to demonstrate flexibility and, if possible, adopt a prior judicial standard that provides an objective standard. . . . As I have described elsewhere, this practical application test not only reflects longstanding Supreme Court precedent,²⁴² but also would comport with the principles of broad eligibility, clarity, constraint on judicial intervention, and flexibility.²⁴³ To replace the inventive application test with a practical application test, “Congress, for example, might explain in the statute that the claimed subject matter must be a practical application of a natural law, physical phenomenon, or abstract idea.”²⁴⁴ Indeed, given the success in 1952 adopting a prior judicial standard, this might be modern reformist’s path to victory.

While, as discussed above, I have concerns with other aspects of the proposal, I support what I view as the heart of the proposal: replacing the “inventive concept” test with a “practical utility” test.

I hope my comments are helpful to the subcommittee. Thank you again for inviting me to participate in this hearing.

²⁴¹ *Rivers v. Roadway Exp., Inc.*, 511 U.S. 298, 313 (1994).

²⁴² David O. Taylor, *Amending Patent Eligibility*, 50 U.C. DAVIS L. REV. 2149, 2172-73 & n.114 (2017).

²⁴³ *Id.* at 2206.

²⁴⁴ *Id.*

Appendix A

I have authored the following articles and book chapter relevant to patent eligibility:

Confusing Patent Eligibility

84 TENN. L. REV. 157 (2016), *available at* <http://ssrn.com/abstract=2754323>

In this article I lay the groundwork for an analysis of potential amendments to the patent statute in the area of patent eligibility by examining the root causes of the current confusion in this area of patent law.

Amending Patent Eligibility

50 U.C. DAVIS L. REV. 2149 (2017), *available at* <http://ssrn.com/abstract=2853700>

This article identifies principles that should guide Congress when it considers patent eligibility legislation, and then uses those principles to analyze several specific options for revising the existing statutory language governing patent eligibility.

Final Report of the Berkeley Center Workshop: Addressing Patent Eligibility Challenges

33 BERK. TECH. L.J. 551 (2018) (co-authored with J. Lefstin and P. Menell), *available at* <http://ssrn.com/abstract=3050093>

This article summarizes the conclusions reached at a workshop of experts (leading industry representatives, practitioners, scholars, policymakers, and a retired jurist) convened to consider patent eligibility, identifies broad consensus that the Supreme Court's patent eligibility jurisprudence is problematic for all areas of technology but particularly for bioscience research and development, and provides a roadmap for a possible legislative solution.

The Supreme Court's Revolution in Patent Eligibility: Alternative Protections for Biotechnology

NATURE BIOTECHNOLOGY (March, 2019), *available at* <https://rdcu.be/bpqad>

This article describes deficiencies with every alternative to US patent eligibility for biotechnology, justifying legislative reform of patent eligibility law.

Patent Reform, Then and Now

__ MICH. ST. L. REV. __ (forthcoming), *available at* <http://ssrn.com/abstract=3212821>

This article highlights the stark similarities between the patent reform effort of 1952 to eliminate the "invention" requirement and the effort now to eliminate the "inventive concept" requirement, and then explores how today's reformers might achieve success based on lessons learned from the effort leading to the Patent Act of 1952.

Patent Eligibility and Investment

__ CARDOZO L. REV. __ (forthcoming), *available at* <http://ssrn.com/abstract=3340937>

This article reveals the results of a survey of venture capital and private equity investors showing that the Supreme Court's recent patent eligibility cases have negatively impacted decisions to invest in research and development generally, but particularly in the biotechnology, medical device, and pharmaceutical industries.

Utility, in Patent Law: Cases and Materials

LAWCARTA (forthcoming) (Mark D. Janis, ed.), *available at* <http://ssrn.com/abstract=3398033>

This forthcoming casebook chapter summarizes the current state of the law of patent utility.

Appendix B

I conducted the following survey, which forms the basis for my article forthcoming in the *Cardozo Law Review* entitled “Patent Eligibility and Investment.”

1. Please indicate whether you agree or disagree:

Patent eligibility is an important consideration when your firm decides whether to invest in a company developing technology.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

2. Please indicate whether you agree or disagree:

If the law of patent eligibility makes patents unavailable for a technology, your firm is less likely to invest in a company developing that technology.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

3. Please indicate whether you agree or disagree:

If the law of patent eligibility makes patents more difficult to obtain for a technology, your firm is less likely to invest in a company developing that technology.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

4. What factors does your firm rely upon when deciding whether to invest in a company developing technology? Please rank the following factors in order of priority, with the most important at the top. (You may drag and drop the factors to re-order them.)

Quality of the company's technology

Availability of U.S. patent protection given U.S. patent eligibility

Availability of foreign patent protection given foreign patent eligibility

Availability of copyright protection

Availability of trade secret protection

First mover advantage

Quality of the company's people

Size of the potential market for the technology

Other _____

5. For each industry in which your firm invests, please indicate how the elimination of patents would affect your firm's decision whether to invest in a company developing technology in that industry (you should skip industries in which your firm does not invest):

	Strongly increase investment	Somewhat increase investment	No impact	Somewhat decrease investment	Strongly decrease investment
Software, Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer and other electronic hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Semiconductor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmaceutical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical devices, methods, and other medical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biotechnology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation (including automotive)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. For each industry in which your firm invests, please indicate how a decreased availability of patents would affect your firm’s decision whether to invest in a company developing technology in that industry (you should skip industries in which your firm does not invest):

	Strongly increase investment	Somewhat increase investment	No impact	Somewhat decrease investment	Strongly decrease investment
Software, Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer and other electronic hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Semiconductor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmaceutical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical devices, methods, and other medical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biotechnology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation (including automotive)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The Supreme Court has decided four cases in the past seven years on the issue of patent eligibility:

- *Bilski v. Kappos* (2010) (finding a method of hedging risk to be patent ineligible);
- *Mayo Collaborative Services v. Prometheus Labs, Inc.* (2012) (finding a method for identifying effective drug doses to be patent ineligible);
- *Association for Molecular Pathology v. Myriad Genetics, Inc.* (2013) (finding isolated DNA to be patent ineligible but cDNA to be patent eligible); and
- *Alice Corp. v. CLS Bank Int’l* (2014) (finding a computer-implemented method of

intermediated settlement to be patent ineligible).

7. Are you familiar with one or more of these decisions?

- Yes
- No

[If “No” was selected in response to Question 7, the survey skipped to Question 15.]

8. Has the effect of these decisions on your firm’s existing investments been positive or negative?

- Very positive
- Somewhat positive
- No impact
- Somewhat negative
- Very negative

9. Have any of these Supreme Court decisions affected your firm's decisions whether to invest in companies?

- Yes
- No
- Don't know

[If "No" or "Don't know" was selected in response to Question 9, the survey skipped to Question 15.]

10. Which decisions affected your firm's decisions whether to invest in companies? (You may select more than one.)

- Bilski v. Kappos (2010)
- Mayo Collaborative Services v. Prometheus Labs., Inc. (2012)
- Association for Molecular Pathology v. Myriad Genetics, Inc. (2013)
- Alice Corp. v. CLS Bank Int'l (2014)

11. How have the cases you selected affected your firm's decisions whether to invest in companies? (You may select more than one.)

- Increased investments overall
- Decreased investments overall
- Shifted investments between industries
- Other (please specify) _____

[If the answer to Question 11 included "Shifted investments between industries," the survey

presented Questions 12 and 13.]

You indicated your firm has shifted investments between industries.

12. *Out of* which industries have you shifted investments (you may select more than one)?

- Software, Internet
- Computer and other electronic hardware
- Semiconductor
- Pharmaceutical
- Medical devices, methods, and other medical
- Biotechnology
- Communications
- Transportation (including automotive)
- Construction
- Energy
- Other (please specify) _____

13. *Into* which industries have you shifted financing (you may select more than one)?

- Software, Internet
- Computer and other electronic hardware
- Semiconductor
- Pharmaceutical
- Medical devices, methods, and other medical
- Biotechnology
- Communications
- Transportation (including automotive)
- Construction
- Energy
- Other (please specify) _____

14. If you are willing, please describe examples of how any of the Supreme Court's decisions on patent eligibility in the last seven years have affected your firm's decisions on how to invest in companies. You can skip this question if you would rather.

[If "Yes" was selected in response to Question 7, at this point the survey skipped to Question 22.]

15. Since 2009, how have your firm's investments in companies changed (you may select more than one)?

- No change
- Increased investments overall
- Decreased investments overall
- Shifted investments between industries
- Other (please specify) _____

[If "No change" was selected in response to Question 15, the survey presented Question 16.]

16. Has a decreased availability of patents since 2009 contributed to your firm's lack of change in investments?

- Yes
- No
- Don't know

[If "Increased investments overall" was selected in response to Question 15, the survey presented Question 17.]

17. Has a decreased availability of patents since 2009 contributed to your firm's increased investments?

- Yes
- No
- Don't know

[If "Decreased investments overall" was selected in response to Question 15, the survey presented Question 18.]

18. Has a decreased availability of patents since 2009 contributed to your firm's decreased investments?

- Yes
- No
- Don't know

[If "Shifted investments between industries" was selected in response to Question 15, the survey presented Questions 19-21.]

You indicated your firm has shifted investments between industries.

19. Has a decreased availability of patents since 2009 contributed to your firm's shifting of investments between industries?

- Yes
- No
- Don't know

20. *Out of* which industries have you shifted investments (you may select more than one)?

- Software, Internet
- Computer and other electronic hardware
- Semiconductor
- Pharmaceutical
- Medical devices, methods, and other medical
- Biotechnology
- Communications
- Transportation (including automotive)
- Construction
- Energy
- Other (please specify) _____

21. *Into* which industries have you shifted financing (you may select more than one)?

- Software, Internet
- Computer and other electronic hardware
- Semiconductor
- Pharmaceutical
- Medical devices, methods, and other medical
- Biotechnology
- Communications
- Transportation (including automotive)
- Construction
- Energy
- Other (please specify) _____

22. Are you willing to engage in a short telephone interview at a later date?

- Yes
- No

Appendix C

What follows is the survey data that forms the basis for my article forthcoming in the *Cardozo Law Review* entitled “Patent Eligibility and Investment.”

Table 1: Investment Stages of Respondents’ Firms

<u>Stage</u>	<u>Percent</u>
Early Stage	59%
Seed Stage	45%
Middle Stage	27%
Growth Stage	22%
Expansion Stage	15%
Late Stage	1%

Table 2: Investment Industries of Respondents’ Firms

<u>Industry</u>	<u>Percent</u>
Software and the Internet	70%
Medical Devices	63%
Computer Electronics/Hardware	61%
Biotechnology	55%
Pharmaceutical	54%
Communications	53%
Energy	49%
Semiconductors	48%
Transportation	47%
Construction	42%

Table 3: Investment Focus of Respondents' Firms

<u>Firm Focus</u>	<u>Percent</u>
Information Technology	62%
Life Sciences & Healthcare	46%
Software & Internet	40%
Manufacturing & Industrial	25%
Business Services	23%
Communications & Networking	20%
Energy & Clean Tech	19%
Media & Digital Media	17%
Consumer Products & Services	16%
Financial Services	15%
Medical Device	15%
Transportation & Distribution	10%
Retail & Restaurant	9%
Food & Agriculture	5%
Real Estate & Construction	5%
Semiconductor	4%
Sports & Entertainment	4%
Education & Training	3%
Defense & Homeland Security	3%
Storage & Hardware	3%
Electronics & Advanced Materials	2%

Table 4: Familiarity with At Least One Eligibility Case

<u>Type</u>	<u>Percent</u>
Familiar	38%
Unfamiliar	62%

Table 5: Investment Stages of Firms: Resp's v. Non-Resp's

<u>Stage</u>	<u>Resp's</u>	<u>Non-Resp's</u>
Early Stage	59%	49%
Seed Stage	45%	30%
Middle Stage	27%	46%
Growth Stage	22%	22%
Expansion Stage	15%	20%
Late Stage	1%	3%

Table 6: Investment Focus of Firms: Resp's v. Non-Resp's

<u>Firm Focus</u>	<u>Resp's</u>	<u>Non-Resp's</u>
Information Technology	62%	55%
Life Sciences & Healthcare	46%	43%
Software & Internet	40%	32%
Manufacturing & Industrial	25%	32%
Business Services	23%	33%
Communications & Networking	20%	22%
Energy & Clean Tech	19%	23%
Media & Digital Media	17%	21%
Consumer Products & Services	16%	24%
Financial Services	15%	16%
Medical Device	15%	13%
Transportation & Distribution	10%	14%
Retail & Restaurant	9%	11%
Food & Agriculture	5%	4%
Real Estate & Construction	5%	6%
Semiconductor	4%	4%
Sports & Entertainment	4%	5%
Education & Training	3%	6%
Defense & Homeland Security	3%	5%
Storage & Hardware	3%	3%
Electronics & Advanced Materials	2%	1%

Table 7: Patent Eligibility is An Important Consideration in Firm Decisions Whether to Invest in Companies Developing Technology

<u>Response</u>	<u>Percent</u>
Strongly agree	43%
Somewhat agree	31%
Neither agree nor disagree	13%
Somewhat disagree	9%
Strongly disagree	5%

Table 8: Less Likely to Invest if Patent Eligibility Makes Patents Unavailable

<u>Response</u>	<u>Percent</u>
Strongly agree	23%
Somewhat agree	39%
Neither agree nor disagree	19%
Somewhat disagree	13%
Strongly disagree	7%

Table 9: Less Likely to Invest if Patent Eligibility Makes Patents More Difficult to Obtain

<u>Response</u>	<u>Percent</u>
Strongly agree	19%
Somewhat agree	40%
Neither agree nor disagree	18%
Somewhat disagree	17%
Strongly disagree	5%

Table 10: Importance of Patent Eligibility by Investment Stage

<u>Stage</u>	<u>Mean (1-5 Scale)</u>
Seed	3.95
Early	3.98
Middle	3.95
Growth	3.84
Expansion	3.88
Late	3.80

Table 11: Importance of Patent Eligibility by Industry

<u>Industry</u>	<u>Mean (1-5 Scale)</u>
Medical Devices	4.17
Biotechnology	4.13
Pharmaceutical	4.13
Energy	4.07
Semiconductors	4.04
Construction	4.01
Computer Electronics/Hardware	3.99
Transportation	3.99
Communications	3.98
Software and the Internet	3.92

Table 12: Patent Eligibility Importance By Industry – Percent Strongly or Somewhat Agreeing Patent Eligibility is an Important Consideration in Firm Decisions Whether to Invest in Companies Developing Technology

<u>Industry</u>	<u>Percent</u>
Medical Devices	81%
Biotechnology	79%
Pharmaceutical	79%
Energy	78%
Semiconductors	76%
Construction	76%
Computer Electronics/Hardware	75%
Transportation	75%
Communications	74%
Software and the Internet	72%

Table 13: Importance of Patent Eligibility by Familiarity with at Least One Eligibility Case

<u>Type</u>	<u>Mean (1-5 Scale)</u>
Familiar	4.18
Unfamiliar	3.93

Table 14: Factors Relied Upon When Deciding To Invest in Companies Developing Technology: Ranking (1-5 of 9)

<u>Factor</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>
Quality of People	48%	23%	14%	5%	3%
Quality of Technology	24%	31%	30%	10%	3%
Size of Potential Market	19%	33%	26%	12%	3%
First Mover Advantage	2%	5%	13%	29%	14%
Avail. of U.S. Patents	2%	4%	10%	27%	34%
Avail. of Trade Secrets	0%	1%	2%	5%	17%
Avail. of Foreign Patents	0%	1%	2%	5%	17%
Avail. of Copyrights	0%	0%	1%	4%	7%
Other	4%	3%	3%	4%	2%

Table 15: Factors Relied Upon When Deciding To Invest in Companies Developing Technology: Weighted Mean

<u>Factor</u>	<u>Mean (1-9 Scale)</u>
Quality of People	7.77
Quality of Technology	7.55
Size of Potential Market	7.24
Avail. of U.S. Patents	5.31
First Mover Advantage	4.94
Avail. of Foreign Patents	3.72
Avail. of Trade Secrets	3.31
Avail. of Copyrights	3.13
Other	2.03

Table 16: Importance of Availability of U.S. Patents When Deciding To Invest in Companies Developing Technology: Weighted Mean (By Industry)

<u>Industry</u>	<u>Mean (1-9 Scale)</u>
Medical Devices	5.42
Pharmaceutical	5.42
Biotechnology	5.41
Energy	5.36
Other	5.35
Semiconductors	5.31
Construction	5.31
Transportation	5.26
Communications	5.26
Computers	5.24
Software and Internet	5.18

Table 17: Impact of Elimination of Patents on Investment Decisions: Weighted Mean

<u>Industry</u>	<u>Mean (1-5 Scale)</u>
Construction	2.82
Software and the Internet	2.74
Transportation	2.67
Communications	2.61
Energy	2.50
Computer/Electronic Hardware	2.39
Semiconductors	2.23
Medical Devices	1.89
Biotechnology	1.83
Pharmaceutical	1.80

Table 18: Impact of Elimination of Patents on Investment Decisions: Responses

<u>Industry</u>	<u>Strongly Increase</u>	<u>Somewhat Increase</u>	<u>No Impact</u>	<u>Somewhat Decrease</u>	<u>Strongly Decrease</u>
Construction	1%	5%	75%	14%	6%
Soft. & Internet	3%	10%	53%	27%	8%
Transportation	2%	7%	53%	31%	7%
Communications	2%	8%	48%	32%	10%
Energy	2%	4%	49%	30%	15%
Comp./Eelec. Hard.	4%	6%	33%	39%	18%
Semiconductors	4%	3%	33%	34%	27%
Medical Devices	6%	3%	11%	32%	47%
Biotechnology	7%	2%	14%	22%	55%
Pharmaceutical	7%	1%	19%	11%	62%

Table 19: Impact of Decreased Availability of Patents on Investment Decisions: Weighted Mean

<u>Industry</u>	<u>Mean (1-5 Scale)</u>
Construction	2.78
Transportation	2.62
Software and the Internet	2.59
Communications	2.54
Energy	2.47
Computer/Electronic Hardware	2.26
Semiconductors	2.09
Medical Devices	1.83
Biotechnology	1.78
Pharmaceutical	1.70

Table 20: Impact of Decreased Availability of Patents on Investment Decisions: Responses

<u>Industry</u>	<u>Strongly Increase</u>	<u>Somewhat Increase</u>	<u>No Impact</u>	<u>Somewhat Decrease</u>	<u>Strongly Decrease</u>
Construction	1%	3%	71%	21%	3%
Transportation	2%	5%	54%	32%	7%
Soft. & Internet	1%	6%	53%	30%	9%
Communications	1%	5%	52%	31%	11%
Energy	2%	4%	48%	33%	13%
Comp./Eelec. Hard.	2%	4%	33%	40%	21%
Semiconductors	1%	2%	30%	40%	27%
Medical Devices	1%	3%	14%	40%	42%
Biotechnology	3%	2%	17%	29%	50%
Pharmaceutical	3%	1%	14%	25%	56%

Table 21: Impact of Supreme Court’s Eligibility Cases on Existing Investments

<u>Response</u>	<u>Percent</u>
Very positive	1%
Somewhat positive	13%
No Impact	46%
Somewhat negative	33%
Very negative	7%

Table 22: Have Any of the Supreme Court’s Eligibility Cases Affected Firm Decisions Whether to Invest In Companies

<u>Response</u>	<u>Percent</u>
Yes	33%
No	61%
Don’t know	6%

Table 23: Respondents Indicating the Supreme Court’s Eligibility Cases Have Affected Firm Decisions Whether to Invest In Companies, By Industry

<u>Industries</u>	<u>Percent</u>
Pharmaceutical	39%
Medical Devices	38%
Semiconductors	38%
Biotechnology	37%
Transportation	36%
Communications	35%
Computer/Electronic Hardware	34%
Construction	34%
Energy	33%
Software and the Internet	32%

Table 24: Which of the Supreme Court’s Eligibility Cases Affected Firm Decisions Whether to Invest In Companies

<u>Response</u>	<u>Percent</u>
Ass’n for Molecular Pathology v. Myriad	38%
Mayo v. Prometheus	29%
Alice v. CLS Bank	20%
Bilski v. Kappos	13%

Table 25: How Have the Cases You Selected Affected Firm Decisions Whether to Invest in Companies

<u>Response</u>	<u>Percent</u>
Decreased investments overall	49%
Shifted investments between industries	34%
Increased investments overall	8%
Other	9%

Table 26: Investments Shifted Away from These Industries

<u>Industries</u>	<u>Percent</u>
Pharmaceutical	26%
Biotechnology	24%
Medical Devices	21%
Software and the Internet	21%
Communications	6%
Computer/Electronic Hardware	3%
Construction	0%
Transportation	0%
Energy	0%
Semiconductors	0%

Table 27: Investments Shifted Into These Industries

<u>Industries</u>	<u>Percent</u>
Computer/Electronic Hardware	16%
Energy	16%
Medical Devices	13%
Software and the Internet	13%
Pharmaceutical	6%
Biotechnology	6%
Semiconductors	6%
Construction	3%
Communications	3%
Transportation	0%

Table 28: Has Decreased Availability of Patents Since 2009 Contributed to Your Firm's Change in Investments (Unknowledgeable Investors Only)

<u>Type of Change</u>	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
No Change	2%	95%	4%
Inc'd investments overall	0%	88%	12%
Dec'd investments overall	14%	82%	5%
Shifted investments b/w industries	4%	84%	12%

Table 29: Eligibility Unknowledgeable Investors Shifted Investments Away from These Industries

<u>Industries</u>	<u>Percent</u>
Energy	17%
Semiconductors	12%
Pharmaceutical	11%
Medical Devices	11%
Biotechnology	10%
Communications	10%
Computer/Electronic Hardware	10%
Software and the Internet	7%
Construction	3%
Transportation	2%

Table 30: Eligibility Unknowledgeable Investors Shifted Investments Into These Industries

<u>Industries</u>	<u>Percent</u>
Software and the Internet	32%
Computer/Electronic Hardware	11%
Transportation	11%
Medical Devices	10%
Communications	8%
Biotechnology	5%
Energy	5%
Pharmaceutical	3%
Construction	3%
Semiconductors	2%

Table 31: Eligibility Knowledgeable Investors' Comments: Positive or Negative

<u>Characterization</u>	<u>Percent</u>
Positive	13%
Negative	83%
Other	4%

Table 32: Eligibility Knowledgeable Investors' Comments:
Percent By Industry

<u>Industries</u>	<u>Percent</u>
Software and the Internet	35%
Biotechnology	30%
Pharmaceutical	13%
Medical Devices	0%
Semiconductors	0%
Transportation	0%
Communications	0%
Computer/Electronic Hardware	0%
Construction	0%
Energy	0%
Generalized	35%

Table 33: Eligibility Knowledgeable Investors' Comments:
Percent Positive and Negative By Industry

<u>Industries</u>	<u>Positive</u>	<u>Negative</u>
Software and the Internet	25%	63%
Biotechnology	14%	86%
Pharmaceutical	0%	100%
Medical Devices	0%	0%
Semiconductors	0%	0%
Transportation	0%	0%
Communications	0%	0%
Computer/Electronic Hardware	0%	0%
Construction	0%	0%
Energy	0%	0%
Generalized	0%	100%