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WHY REMOVING 101 WON'T BE ENOUGH AND WHAT TO DO INSTEAD

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Congress recently released a reform proposal for Section 101 of the U.S. Patent Act. The draft included the following language: "No implicit or other judicially created exceptions to subject matter eligibility including 'abstract ideas,' 'laws of nature, or 'natural phenomena,' shall be used to determine patent eligibility under Section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated."[1] This is a blatant attempt to overturn Alice Corp v. CLS Bank International,[2] Mayo Collaborative Services v. Prometheus Laboratories, Inc.,[3] and related cases which created the judicial exceptions that prevent the patenting of "abstract ideas," "laws of nature," and "natural phenomena." However, simply abrogating the cases with language like the above will not be enough to survive the Supreme Court. Without significant alterations to the proposed text, the effort to abrogate the judicial exceptions is doomed to failure. Section I of this article briefly explores the reasons Mayo and Alice need to be abrogated. Section II investigates the legal and philosophical

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[1] *See* Eileen McDermott, *Draft Text of Proposed New Section 101 Reflects Patent Owner Input*, IPWATCHDOG (May 22, 2019), https://www.ipwatchdog.com/2019/05/22/draft-text-proposed-new-section-101-reflects-patent-owner-input/id=109498/ [https://perma.cc/N2S4-86TN].

[2] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 208 (2014).

[3] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 67 (2012).

underpinnings of Mayo and Alice. Section III discusses how Mayo and Alice's legal underpinnings doom the current legislative proposal. Contrary to the opinions of some,[4] *these cases do have a constitutional basis and interested parties ignore that basis at their peril. Section IV provides alternative ways forward.*

I. INTRODUCTION

One half of the 2015 Nobel Prize in Physiology or Medicine was awarded to Tu Youyou for the discovery of Artemisinin.[5] According to the Nobel Prize Committee, this discovery will have

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[4] *See* Gene Quinn, *Sherry Knowles Scrutinizes an Activist Supreme Court and its Unconstitutional Approach to Patent Eligibility*, IPWATCHDOG (Jan. 16, 2019), https://www.ipwatchdog.com/2019/01/16/sherry-knowles-scrutinizes-activist-supreme-court-unconstitutional-patent-eligibility/id=105228/ [https://perma.cc/FD5G-L8YR]; Gene Quinn, *Does the Supreme Court Even Appreciate the Patent Eligibility Chaos They Created*?, IPWATCHDOG (Nov. 12, 2018), https://www.ipwatchdog.com/2018/11/12/103256/id=103256/ [https://perma.cc/SC74-JAPS].

[5] Press Release, Nobel Assembly at Karolinska Institutet, The Nobel Prize in Physiology or Medicine 2015 (Oct. 5, 2015), https://www.nobelprize.org/prizes/medicine/2015/press-release/ [https://perma.cc/MJ9W-TUH3] [hereinafter *Nobel Assembly*].

"consequences in terms of improved human health and reduced suffering [that] are immeasurable."[6] However, if Ms. Youyou applied for a patent on Artemisinin in the United States, it would be denied under Section 101 of the Patent Act as a product of nature.

The Patent Act controls the operations of the United States Patent and Trademark Office ("USPTO") which grants inventors patents on their inventions.[7] The Patent Act contains three main Sections: 101, 102, and 103.[8] Section 103 governs determining if the proposed invention is merely obvious over the prior art and therefore not deserving of a patent.[9] Section 102 governs determining if the proposed invention is novel over the prior art and so deserving of a patent.[10] Section 101 governs eligible subject matter and states that articles of manufacture, machines, processes, compositions of matter, or improvements of the above are patentable.[11]

So-called judicial exceptions to 101 have arguably existed since the 1800's,[12] but the U.S. Supreme Court recently rejuvenated them in *Alice Corp. v. CLS Bank International*,[13] *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*,[14] and related cases. *Alice*, *Mayo*, and related cases held that abstract ideas, laws of nature, and natural phenomena are unpatentable.[15] As Artemisinin, is produced by the sweet wormwood plant, it would be an unpatentable natural product.[16]

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[6] *Id*.

[7] *See* Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 148 (1989).

[8] *Id.* at 148–50; 35 U.S.C. §§ 101–03 (2018).

[9] *Bonito Boats, Inc*., 489 U.S. at 150.

[10] *Id.*

[11] *Id.* at 148.

[12] *See infra* Section II.

[13] *See* Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 208 (2014).

[14] *See* Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 67 (2012).

[15] *See Alice Corp*., 573 U.S. at 208; *Mayo Collaborative*, 566 U.S. at 67; *see also infra* Section II.

[16] *See Nobel Assembly*, *supra* note 5.

In the past, inventors would claim a purified form of a natural compound, and these patents held up in court.[17] Current law would invalidate these patents. The Supreme Court has held broadly that natural products are unpatentable.[18] Myriad Genetic's argument that isolating BRCA genes[19] from the human genome[20] made the isolated genes patent eligible was rejected by the Supreme Court.[21] The Supreme Court made no mention of any of the lower court cases upholding purified forms of a natural compound. However, the Supreme Court would likely hold isolated Artemisinin is still simply natural Artemisinin like the isolated BRCA gene was still simply the natural BRCA gene. The USPTO in its eligibility examples certainly takes this approach.[22] The only tenable explanation is that, though worthy of a Nobel Prize, Artemisinin is unpatentable.

Natural products, however, are "almost an inexhaustible array of molecular entities"[23] and an "infinite resource for drug development [.]"[24] The fact that around half of the drugs approved during the last thirty years, several of them blockbuster drugs, are derived from natural products makes their critical role in modern

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[17] *See generally* Merck & Co. v. Olin Mathieson Chem. Corp., 253 F.2d 156 (4th Cir. 1958) (upholding a patent on a purified form of vitamin B_{12}); Parke-Davis & Co. v. H.K. Mulford Co., 189 F. 95 (S.D.N.Y. 1911) (upholding patented claims on purified adrenaline).

[18] Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 589 (2013).

[19] Particular mutations, changes in the DNA base structure, at particular points in the genome lead to increased risk of cancer. *Myriad Genetics*, 569 U.S. at 582–83. Mutation in the BRCA gene is known to lead to an increased risk of breast cancer. *Id*. at 583.

[20] *Myriad Genetics*, 569 U.S. at 593.

[21] *Id*.

[22] *See* U.S. PATENT & TRADEMARK OFFICE, SUBJECT MATTER ELIGIBILITY EXAMPLES: LIFE SCIENCES 4, 18–19 (May 4, 2016) https://www.uspto.gov/sites/default/files/documents/ieg-may-2016-ex.pdf [https://perma.cc/UUF3-H62N]; U.S. PATENT & TRADEMARK OFFICE, NATURE-BASED PRODUCTS 4, 6–8, 10, 12, 14–15 (Dec. 16, 2014), https://www.uspto.gov/sites/default/files/documents/mdc_examples_nature-based_products.pdf [https://perma.cc/N9AN-TJR3].

[23] Ciddi Veeresham, *Natural Products Derived from Plants as a Source of Drugs*, 3 J. ADVANCED PHARM. TECH. & RES. 200, 200 (2012).

[24] *Id*.

drug discovery self-evident.[25] All of these drugs would now be patent ineligible.

Currently, discovering and bringing a new drug to market costs upwards of 2.8 billion dollars.[26] Why would any company spend this incomprehensible amount of money if the well-funded and established generic industry could market the invention as soon as it is approved by the FDA without the associated exorbitant costs? Unless the return on investment is economically justified, the incentive is removed. As our current battery of antibiotics becomes unusable,[27] do we really want to remove the business justification for finding viable natural replacements? Expecting debt-strapped governments to pick up the slack is naïve. The imbalance between legal protections and business incentives is illustrated by the decrease since 2009 in private venture capital and equity investment in biotechnology medical devices and pharmaceuticals.[28]

The change in incentives has also impacted the software industry as shown by reduced investment in the software space.[29] Recognizing these facts David Kappos, the director of the USPTO under President Obama from 2009 to 2013, has called for the removal of Section 101.[30] Mr. Kappos reasoned that (1) current

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[25] *Id*.

[26] Joseph A. DiMasi et al., *Innovation in the Pharmaceutical Industry: New Estimates of R&D Costs*, 47 J. HEALTH ECON. 20, 27 (2016).

[27] *See* Ryan W. Miller, *Drug-Resistant Superbugs are Killing Thousands of Americans. Here's What You Need to Know About Them*, USA TODAY (last updated Dec. 2, 2019), https://www.usatoday.com/story/news/health/2019/11/15/antibiotic-resistant-superbugs-killing-thousands-what-know/4189718002/ [https://perma.cc/4DRZ-DNR7].

[28] David O. Taylor, *Patent Eligibility and Investment*, CARDOZO L. REV. (forthcoming) (SMU Dedman Sch. of Law Legal Studies Research Paper No. 414, 2019), https://ssrn.com/abstract=3340937 [https://perma.cc/RPN7-E7FB]; Jason Rantanen, *Guest Post on Patent Eligibility and Investment: A Survey*, PATENTLYO (Mar. 6, 2019), https://patentlyo.com/patent/2019/03/patent-eligibility-investment.html [https://perma.cc/32JQ-3MJD].

[29] Taylor*, supra* note 28.

[30] Telephone Interview with David J. Kappos, Dir., U.S. Patent & Trademark Office (2016) [hereinafter Kappos Interview]; *see also* Daniel Cole, *Should Section 101 of the Patent Act be Removed*, IPWATCHDOG (June 23, 2016),

eligibility law threatens protection of key American industries,[31] (2) Europe and Asia have no problems constraining patent eligible subject matter without a section equivalent to 101,[32] and (3) the policy issues dealt with by Section 101 can be better dealt with through use of Sections 102 and 103.[33] Since America "is providing less protection than other countries[,]" an inventor is better off seeking patents in Europe or China.[34]

Modern economies are based on innovation. If America is going to continue its economic and global leadership, we need to increase, not decrease, the rewards for innovation. Grueling hours spent in the lab or the machine shop require incentive.[35] "[L]osing the innovative edge and becoming economically dominated by other countries is how modern countries die."[36]

In an attempt to address the above concerns Congress recently released a draft proposal that would reform Section 101 of the Patent Act. The draft included the following language: "No implicit or other judicially created exceptions to subject matter eligibility, including 'abstract ideas,' 'laws of nature,' or 'natural phenomena' shall be used to determine patent eligibility under Section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated."[37] The draft proposal cited above is a blatant attempt to overturn the eligibility cases discussed above. However, simply abrogating the cases with language like the above will not be enough to eliminate the exceptions. Without significant alterations to the proposed text, the effort to make abstract ideas, laws of nature, and natural phenomena patentable is doomed to failure.

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https://www.ipwatchdog.com/2016/06/23/section-101-patent-act-removed/id=70230/ [https://perma.cc/6D7T-8C64].

[31] Kappos Interview, *supra* note 30.

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] Cole, *supra* note 30.

[36] *Id.*

[37] *See* Eileen McDermott, *Draft Text of Proposed New Section 101 Reflects Patent Owner Input*, IPWATCHDOG (May 22, 2019), https://www.ipwatchdog.com/2019/05/22/draft-text-proposed-new-section-101-reflects-patent-owner-input/id=109498/ [https://perma.cc/KU5B-5VS4].

II. THE PHILOSOPHICAL AND LEGAL UNDERPINNINGS OF *MAYO* AND *ALICE*

When modern courts deal with the judicial exceptions to Section 101 of the Patent Act, they do so using what has come to be known as the Mayo Alice two-step. Claims are first analyzed to see if they are directed to one of the judicial exceptions. In the second step, claims found to be directed to one of the judicial exceptions are analyzed to see if enough has been added to the claims to make them eligible. One of the most common criticisms of the current 101 decisions is that they inappropriately incorporate concerns more properly addressed in 102 and 103.[38] Often cited is the fact that the Court has used the presence of manual non-computer based analogues to label ideas abstract,[39] Congressional removal of inventiveness as a specific patentability requirement,[40] and the Court's focus on if claim elements are well-understood or conventional.[41] However, as will be seen throughout this article, those citing these concerns neglect or lack an understanding of patent eligibility precedent.

A. Precedent for Incorporating Novelty and Obviousness into 101 Evaluations

1. Patents Found Ineligible

Bilski and *Mayo* are two modern cases that are often criticized for incorporating concerns more properly addressed in 102 and

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[38] *See* Ron Laurie, *Alice in Blunderland: The Supreme Courts Conflation of Abstractness and Obviousness*, IPWATCHDOG (Dec. 11, 2014), https://www.ipwatchdog.com/2014/12/11/alice-in-blunderland-the-supreme-courts-conflation-of-abstractness-and-obviousness/id=52563/ [https://perma.cc/GCC8-A7XZ]; *Clarifying the Distinction Between the "Inventive Concept" and "Patentability" requirements when determining Patent-Eligible Subject Matter*, CARSTENS & CAHOON LLP, https://www.cclaw.com/2016/10/21/clarifying-distinction-inventive-concept-patentability-requirements-determining-patent-eligible-subject-matter/ [https://perma.cc/P63E-JNEE] (last visited Mar. 17, 2020); Paxton M. Lewis, *The Conflation of Patent Eligibility and Obviousness: Alice's Substitution of Section 103*, 2017 UTAH L. REV. ONLAW 13 (2017).

[39] *See* Laurie, *supra* note 38.

[40] *See Clarifying the Distinction*, *supra* note 38.

[41] *See* Lewis, *supra* note 38.

103. An analysis of these cases and how they relate to *Diamond v. Diehr*, *Parker v. Flock*, *Gottschalk v. Benson, Funk Brothers, Mackay Radio and Telegraph Co, Rubber-Tip Pencil Company v. Howard*, *O'Reilly v. Morse, Le Roy v. Tatham* illustrates the precedent for such inclusion. The claim at issue in *Bilski v. Kappos* included the steps of:

> (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers;
>
> (b) identifying market participants for said commodity having a counter-risk position to said consumers;
>
> (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.[42]

Claim 4 converted this process into a mathematical formula.[43] Later claims limited the process to certain industries[44] or suggested using well-known methods to determine variables in the equation.[45] The Supreme Court found the claims unpatentable partially because they were not "tied to a particular machine or apparatus"[46] and they did not "transform a particular article into a different state or thing."[47] Limiting use to energy markets was simply limiting an abstract idea to one field of use or adding token post-solution components.[48]

In *Mayo*,[49] which established the modern understanding of the Product and Law of Nature exception,[50] the Court found the claim unpatentable partially because it only contained conventional and

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[42] Bilski v. Kappos*,* 561 U.S. 593, 599 (2010).
[43] *Id.* at 595.
[44] *Id.* at 610.
[45] *Id.* at 595.
[46] *Id.* at 596.
[47] *Id.*
[48] *Id.* at 608. The Court cited *Le Roy v. Tatham, Funk Brothers v. Kalo Inoculant Co.*, *Diamond v. Diehr*, *Parker v. Flook*, and *Gottschalk v. Benson* in reaching this decision.
[49] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66 (2012).
[50] *Id.*

obvious activity when the law of nature was removed.[51] The Court characterized the claim as stating a natural law that applied conventional obvious methods.[52] As described in relation to *Bilski*, worrying about parts of the claim being obvious or conventional are 102 and 103 concerns.

Diamond v. Diehr[53] dealt with the patentability of an algorithm embodied using a digital computer involved in curing synthetic rubber.[54] Claim 1 of the patent read:

> A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:
>
> providing said computer with a database for said press, including at least,
>
> natural logarithm conversion data (ln)
>
> the activation energy constant (C) unique to each batch of said compound being molded, and
>
> a constant (x) dependent upon the geometry of the particular mold of the press,
>
> initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure
>
> constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,
>
> constantly providing the computer with the temperature (Z)
>
> repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is
>
> $$\ln v = CZ + x$$
>
> where v is the total required cure time,
>
> repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and
>
> opening the press automatically when a said comparison indicates equivalence.[55]

Even based solely on claim length the specificity of the *Diehr* claim when compared to the *Bilski* claim is obvious. The

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[51] *Id.* at 76.
[52] *Id.*
[53] Diamond v. Diehr, 450 U.S. 175 (1981).
[54] *Id.* at 177.
[55] *Id.* at 193 n.5.

Court characterized the claim here as necessarily including (1) continuously measuring the temperature inside a rubber curing mold cavity, (2) using the continuously changing temperature to calculate a continuously changing cure time using the Arrhenius equation, and (3) signaling the computer to open the press when the proper cure time is reached.[56] In contrast to *Diehr*, the mathematical formula used was applied to a known structure or process.[57] Importantly, all of this discussion was part of deciding if the claim was eligible under 101.

Parker v. Flook dealt with what the Court determined was simply an algorithm.[58] Claim 1 of the patent read:

> A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons wherein said alarm limit has a current value of
>
> Bo + K
>
> wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises:
>
> (1) Determining the present value of said process variable, said present value being defined as PVL;
>
> (2) Determining a new alarm base B1, using the following equation:
>
> B1 = Bo(1.0-F) + PVL(F)
>
> where F is a predetermine number greater than zero and less than 1.0;
>
> (3) Determining an updated alarm limit which is defined as B1 + K; and thereafter
>
> (4) Adjusting said alarm limit to said updated alarm limit value.[59]

Again, even a simple comparison of this claim with *Diehr* highlights the differences in specificity. The Court characterized this claim as requiring (1) measuring the present value of the process variable, (2) using a specific algorithm to calculate an updated alarm limit value, and (3) updating the actual alarm limit

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[56] *Id.* at 178.

[57] Bilski v. Kappos, 561 U.S. 593, 607–08 (2010). Along with the cases cited by *Bilski*, the Court cited *Rubber Tip Pencil*, *O'Reilly v. Morse and Mackay Radio & Telegraph* in reaching their decision.

[58] Parker v. Flook, 437 U.S. 584 (1978).

[59] *Id.* at 596–97 (spacing in original).

to the adjusted value.[60] In discussing 101 eligibility, the Court separated out steps they considered to be conventional.[61] Only once these steps were removed could the eligibility of what was left be considered under 101.[62]

One of the first cases dealing with the eligibility of computer inventions, *Gottschalk v. Benson,*[63] dealt with converting binary-coded decimal numbers into pure binary numbers.[64] The Court characterized the question as "whether the method described and claimed is a process within the meaning of the Patent Act."[65] As detailed in the introduction, the patentability of processes is established by Section 101 of the Patent Act. In denying the patentability of the claim, the Court focused on (1) the general nature of the invention as claimed,[66] and (2) the fact it could be performed on "existing computers"[67] or even without a computer.[68]

Funk Brothers dealt with a mixture of "selected mutually non-inhibitive strains of different strains of bacteria of the genus Rhizobium."[69] Similarly to *Flook*, the Court separated out what they characterized as obvious applications of the natural principle.[70] The 101 question of import was not can the sale of artificially mixed non-inhibitive species of Rhizobium be protected by a patent, but is the fact that some strains of Rhizobium are mutually non-inhibitive patentable.[71] Once it was known that certain strains of Rhizobium were mutually non-inhibitive, mixing

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[60] *Id.* at 585.
[61] *Id.* at 588, 590–94.
[62] *See id.* at 594.
[63] Gottschalk v. Benson, 409 U.S. 63 (1972).
[64] *Id*. at 66–67.
[65] *Id*. at 64.
[66] *Id.* at 65.
[67] *Id.* at 67.
[68] *Id.*
[69] Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 132 n.1 (1948).
[70] *Id*. at 131.
[71] *Id.* at 131–32. Rhizobium bacteria take nitrogen from the air and "fix" it in soil in a form that can be absorbed by plants. Different strains work better for different types of plants, but these strains generally kill each other. The eponymous Funk brothers discovered strains of Rhizobium that did not kill each other and attempted to patent a mixture as fertilizer.

them was the product of skill—not invention.[72] Mixing them and selling them as fertilizer was obvious.[73]

Mackay Radio and Telegraph Co.[74] turned on claim interpretation and enablement. However, while discussing mathematical expressions of scientific truths are not patentable, the Court stated "novel and useful structure[s] created with the aid of knowledge of scientific truth may be [patentable]."[75] Novelty of invention is not mentioned in Section 101 of the Patent Act – it is only mentioned in Sections 102 and 103.[76]

Precedent for incorporating novelty and obviousness into 101 evaluations can even be found in the everyday lead pencil. In *Rubber-Tip Pencil Company v. Howard*,[77] the detachable eraser was found to be patent ineligible.[78] According to the Court, once the well-known erasive and elastic properties of rubber were removed from the disclosure only an idea was left. Using precedent and philosophy that will be discussed infra the Court found the idea unpatentable. Considering if parts of the invention are well-known is a 103 consideration.

The patent for arguably one of the most important inventions of the 19th century, the telegraph, was constrained when the Court incorporated 102 and 103 concepts into an eligibility discussion. In *O'Reilly v. Morse*,[79] Morse claimed "the use of the motive power of the electric or galvanic current . . . however developed, for making or printing intelligible characters, signs or letters at any distances . . . ."[80] Citing the importance of allowing others to practice novel, nonobvious improvements, the court limited

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[72] *Id.* at 132.
[73] *See id.*
[74] Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86 (1939).
[75] *Id.* at 94.
[76] *See supra* Introduction.
[77] Rubber-Tip Pencil Co. v. Howard, 87 U.S. 498 (1874).
[78] *Id.* at 507.
[79] O'Reilly v. Morse, 56 U.S. 62 (1853).
[80] *Id.* at 86.

Morse's rights to the specific method contained in his specification.[81]

As will be discussed infra *Le Roy v. Tatham*[82] established the 101 exceptions as well as their legal and philosophical basis. Important here is that even in this foundational case considerations of novelty and obviousness were an important part of the eligibility discussion. *Le Roy v. Tatham* arguably established both the 101 exceptions as well as the legal and philosophical basis for them.[83] Considerations of novelty and obviousness were an important part of the eligibility discussion. The district court instructed the jury that even if the "combination of machinery in the abstract [was] not new"[84] the invention was eligible since it applied a newly discovered principle.[85] The Supreme Court overturned this instruction.[86]

2. Patents Found Eligible

Along with looking at patents found ineligible, it is instructive to look at patents the court found eligible. The fact that novelty and non-obviousness of the claims were consistently crucial to the claim's eligibility illustrates how considerations of novelty and non-obviousness have always been part of eligibility considerations.

Tilghman v. Proctor[87] claimed "the manufacturing of fat acids and glycerin from fatty bodies by the action of water at a high temperature and pressure."[88] Noting that methods of producing glycerin from fatty bodies and water at 400 degrees existed at the time of the patent,[89] the Court used the specification[90] to construe

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[81] *Id.* at 113–14.
[82] Le Roy v. Tatham, 55 U.S. 156 (1852).
[83] *See infra* Sections II-B and II-C.
[84] *Id.* at 159.
[85] *Id.*
[86] *Id*. at 174–75.
[87] Tilghman v. Proctor, 102 U.S. 707 (1880).
[88] *Id.* at 709.
[89] *Id*. at 734.
[90] The specification is the figures and description included in a patent, it's basically everything other than the section starting with "I claim . . . ." which is called the claims.

the claim as "the process of subjecting to a high degree of heat a mixture continually kept up, of nearly equal quantities of fat and water in a convenient vessel strong enough to resist the effort of the mixture to convert itself into steam."[91] This novel and nonobvious claim was eligible.[92]

Similarly, the claim in *New Process Fermentation Co. v. Maus*[93] read: "[t]he process of preparing and preserving beer for the market, which consists in holding it under controllable pressure of carbonic acid gas from the beginning of the kraeusen state until such time as it is transferred to kegs and bunged, substantially as described."[94] Using the specification, the Court construed the claim as:

> [W]hen the beer has been put into the casks, and the kraeusen beer is added to it, and the apparatus is applied at the beginning of the kraeusen stage, the beer will be kept under a controllable pressure of carbonic acid gas until such time as it is fit to be transferred to the kegs for market, such pressure resulting in the complete and speedy clarification of the beer, although it is in a state of active fermentation in closed shavings casks, with the incidental results of no loss of beer, no fouling of the casks or the cellar, no alteration of the flavor of the beer, and no danger to the health of the workmen.[95]

This novel and nonobvious invention[96] was patent eligible.[97]

Expanded Metal Company v. Bradford[98] provides another example where novelty and non-obviousness were critical to claim eligibility under Section 101. The claim at issue in *Expanded Metal Company* read:

> The herein described method of making open or reticulated metal work, which consists in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate, and then similarly slitting and bending in places alternate to the first mentioned

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[91] *Tilghman,* 102 U.S. at 729.
[92] *See id.* at 729–30.
[93] New Process Fermentation Co. v. Maus, 122 U.S. 413 (1887).
[94] *Id*. at 423.
[95] *Id*. at 428.
[96] *See id.* at 424–27.
[97] *Id.* at 428.
[98] Expanded Metal Co. v. Bradford, 214 U.S. 366 (1909).

> portions, thus producing the finished expanded sheet metal of the same length as that of the original sheet, substantially as described.[99]

"The[] record[] [in *Expanded Metal Company* left] no doubt that there are substantial advantages in the method of the patent in suit."[100] This novel and nonobvious claim was eligible under 101.[101]

It is true that Section 102 and Section 103 did not exist when some of these earlier cases were decided.[102] This has not, however, made a difference to the Court. Exactly how obviousness and novelty should be considered in eligibility decisions has been debated by the Court. Three judges believed that limiting the patent in *Flook* to catalytic conversion made it patentable.[103] Four judges believed that under *Flook* the disclosure in *Diamond. v. Diehr* was ineligible.[104] As the above discussion shows however, all the judges believed that novelty and obviousness should be considered in eligibility decisions.[105]

B. Legal Precedent for the 101 Exceptions

Ever since Thomas Jefferson referred to "the public embarrassment of an exclusive patent,"[106] patentability has had a rocky history in the United States. But even though precedent exists for incorporating 102 and 103 considerations into 101 decisions, surely those who say no precedent exists for the 101

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[99] *Id.* at 377.

[100] *Id.* at 378.

[101] *Id.* at 385–86.

[102] *See Patents,* 35 U.S.C. (1952); Patent Act of 1790, 1 Stat. 109; Patent Act of 1836, 5 Stat. 117. Earlier Patent Acts had portions similar to Section 101 and 102, but they were part of a general patentability section. Obviousness was not introduced until 1952 when Section 101, 102, and 103 were added.

[103] Parker v. Flook, 437 U.S. 584, 599–600 (1978) (Stewart, J., dissenting).

[104] Diamond v. Diehr, 450 U.S. 175, 204–18 (1981) (Stevens, J., dissenting).

[105] *But see id.* at 188–91 n.12 (discussing the impropriety of importing section 102 and 103 considerations into 101). But as shown by above discussion of cases since 1975 this discussion has been ignored by the court and is at odds with earlier precedent.

[106] THE WRITINGS OF THOMAS JEFFERSON 13:333–335 (Andrew A. Lipscomb & Albert Ellery Bergh, eds., 1905).

exceptions[107] are correct. Section 101 of the Patent Act lists no exceptions and simply states that articles of manufacture, machines, processes, compositions of matter, or improvements of the above are patentable.[108] As with the incorporation of 102 and 103 into 101, a careful and thoughtful reading of the historical cases elucidates the legal and philosophical underpinnings and why those who say they do not exist are incorrect.

1. Abstract Ideas

The modern articulation of the "abstract idea" exception was made in *Alice Corp v. CLS Bank*.[109] Claim 33, which reads as shown below, was used as a representative claim:

> A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
>
> (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
>
> (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and at the end of the day the supervisory institution instructing on[e] of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said

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[107] *See* Gene Quin, *Sherry Knowles Scrutinizes an Activist Supreme Court and its Unconstitutional Approach to Patent Eligibility*, IPWATCHDOG (Jan. 19, 2019), https://www.ipwatchdog.com/2019/01/16/sherry-knowles-scrutinizes-activist-supreme-court-unconstitutional-patent-eligibility/id=105228/ [https://perma.cc/5NFS-MSTC]; Gene Quin, *Does the Supreme Court Even Appreciate the Patent Eligibility Chaos They Created*?, IPWATCHDOG (Nov. 12, 2018), https://www.ipwatchdog.com/2018/11/12/103256/id=103256/ [https://perma.cc/JJ89-6PBU].

[108] *See* Bonito Boats Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 148 (1989).

[109] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208 (2014).

> permitted transactions, the credits and debits being irrevocable time invariant obligations placed on the exchange institutions.[110]

The Court characterized this as an intermediary creating and updating account ledgers as real-world accounts changed, and only allowing transactions that kept the accounts in the black.[111] The Court determined the claims were directed to the well-known idea of intermediated settlement,[112] and amounted to generic computer implementation of an abstract idea,[113] and were thus invalid.[114]

In deciding if claims directed to a judicial exception[115] have enough extra material, the obviousness and novelty of this extra material is analyzed.[116] As was discussed previously, incorporating such 102 and 103 considerations into 101 analysis has a long precedent.[117]

Claim 1 in *Bilski*, which was cited by *Alice*,[118] was cited *supra* and will not be repeated here. Claim 4 converted this process into a mathematical formula.[119] Later claims limited the process to certain industries[120] or suggested using well-known methods to determine variables in the equation.[121] The Court found this an ineligible attempt to patent the application of the abstract idea of risk hedging in energy markets.[122] The Court struck down the patent.[123]

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[110] *Id.* at 209 n.2.

[111] *Id.* at 210, 216.

[112] *Id.* at 215–18 (citing Bilski v. Kappos, 561 U.S. 593 (2010); O'Reilly v. Morse, 56 U.S. 62 (1853); Le Roy v. Tatham, 55 U.S. 156 (1852); Diamond v. Diehr, 450 U.S. 175 (1981); Gottschalk v. Benson, 409 U.S. 63 (1972); Parker v. Flook, 437 U.S. 584 (1978)).

[113] *Id.* at 216, 220–23.

[114] *Id.* at 220–23.

[115] Abstract Idea, Phenomena of Nature, and Natural Product are commonly referred to as the judicial exceptions. *See* 35 U.S.C. § 101 (2018).

[116] *See* Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 76 (2012).

[117] *See supra* Section II-A.

[118] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 210 (2014).

[119] Bilski v. Kappos, 561 U.S. 593 (2010).

[120] *Id.*

[121] *Id*.

[122] *Id.* at 606.

Since the Court found the claims in *Diamond v. Diehr* eligible,[124] it provides an important contrast. Claim 1 of the *Diehr* patent was cited in the previous section. As a reminder, the court characterized the steps of the invention as: (1) continuously measuring the temperature inside the mold cavity, (2) using the continuously changing temperature to calculate a continuously changing cure time using the Arrhenius equation, and (3) signaling the computer to open the press when the proper cure time is reached.[125] The Court characterized this not as an attempt to patent the Arrhenius equation or even an abstract application of the Arrhenius equation, but an application of the law of nature to a concrete physical process.[126] The Court also made much of the arguably minor lexicological fact that the claim in question was a process rather than a method claim as in *Flook*.[127] As discussed previously,[128] four Supreme Court justices, citing *Flook*, would have invalidated the claims.[129]

Flook, *Gottschalk*, and *Rubber Tip Pencil* were discussed in detail in the last section. In each of these cases, the invention was found ineligible as an abstract idea or as the court described it in *Rubber Tip Pencil* as early as the late 19th century an unpatentable "idea of itself."[130]

Corning v. Burden[131] is somewhat problematic but important. *Corning* held that patents were grantable for "the means or method of producing a certain result"[132] but not "the result or effect produced."[133] This was a significant alteration of the language used in previous cases, and was not used in subsequent cases. Taken

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[123] *Id.* at 609 (citing Gottschalk v. Benson, 409 U.S. 63 (1972); Parker v. Flook, 437 U.S. 584 (1978); Diamond v. Diehr, 450 U.S. 175 (1981); Le Roy v. Tatham, 55 U.S. 156 (1852); Diamond v. Chakrabarty, 447 U.S. 303 (1980)).

[124] *Diehr*, 450 U.S. at 188.

[125] *Id.* at 178.

[126] *Id*. at 187–88.

[127] *Id.* at 188 n.10.

[128] *See supra* notes 102-05.

[129] *Diehr,* 450 U.S. at 204–18 (Stevens, J., dissenting).

[130] Rubber Tip Pencil Co. v. Howard, 87 U.S. 498, 507 (1874).

[131] Corning v. Burden, 56 U.S. 252 (1853).

[132] *Id.* at 268.

[133] *Id.*

literally this language would seem to prohibit the patenting of new states of matter. New states of matter, such as pharmaceutical drugs, would certainly seem to be results or produced effects of means or methods. This may be why the language was dropped. How later cases deal with *Corning* and with *Cochrane*,[134] which defined a patentable process as acts transforming an item to a "different state or thing"[135] is important context for the philosophical basis for the 101 exceptions.

The Supreme Court overturned the instruction, stating that a newly discovered principle applied using non-new machinery and methods was patentable in *Le Roy*.[136] The Court also stated:

> It is admitted that a principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these can not be patented, as no one can claim in either of them an exclusive right. Nor can an exclusive right exist to a new power, should one be discovered in addition to those already known. Through the agency of machinery, a new steam power may be said to have been generated. But no one can appropriate this power exclusively to himself under the patent laws. The same may be said of electricity and any other power in nature which is alike open to all and may be applied to useful purposes by the use of machinery.[137]

As early as 1852 in *Le Roy v. Tatham*, the Court established that abstract ideas were ineligible for patenting, an idea that was later referenced and reinforced in *Alice* which is seen as the modern interpretation of this exception. Just because the lower courts, USTPO, and the Patent Bar ignored over 150 years of precedent, does not mean the Supreme Court will do so. At most the Supreme Court could overrule this precedent, but the precedent must be acknowledged and a well-reasoned and researched argument presented for overturning it. So far no one has presented such an argument to the Supreme Court.

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[134] Cochrane v. Deener, 94 U.S. 780 (1876).
[135] *Id.* at 788.
[136] *See* Le Roy v. Tatham, 55 U.S. 156, 174–75 (1852).
[137] *Id*.

2. Products, Laws of Nature

Similarly, as to how *Alice* established the modern understanding of the abstract idea exception,[138] the modern understanding of the "product of nature" or "law of nature" exception was established by *Mayo*.[139] The contested claim in *Mayo* read:

> A method of optimizing therapeutic efficacy for treatment of an immune-mediated gastrointestinal disorder, comprising:
>
> (a) administering a drug providing 6-thioguanine to a subject having said immune-mediated gastrointestinal disorder; and
>
> (b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder,
>
> wherein the level of 6-thioguanine less than about 230 pmol per $8x10^8$ red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject and
>
> wherein the level of 6-thioguanine greater than about 400 pmol per $8x10^8$ red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.[140]

At the time the patent was filed it was known that measurement of 6MP metabolites, such as 6-thioguanine, could be used to predict the clinical efficacy and tolerance to thiopurine drugs.[141] The specific ranges claimed, however, were novel. Under the first step in the *Mayo* two step analysis, because the detected ranges were determined by the metabolism of thiopurine drugs by the patient's body, the Court characterized the claims as relating to a natural process/law.[142] Following the next step in the *Mayo* two step analysis,[143] the Court characterized the rest of the claim as obvious and conventional, and so invalidated the patent.[144]

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[138] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208 (2014).

[139] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66 (2012).

[140] *Id*. at 74–75.

[141] *Id*.

[142] *Id.* at 77.

[143] *See id*.

[144] *Id*. at 70–71, 94 (citing Diamond v. Diehr, 450 U.S. 175, 185 (1981); Bilski v. Kappos, 561 U.S. 593, 601 (2010); Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980); Le Roy v. Tatham, 14 How. 156, 175 (1853); O'Reilly v. Morse, 15 How. 62, 112-120 (1854); Gottschalk v. Benson, 409 U.S. 63, 67 (1972); Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86

Isolated genes and other natural products were found ineligible for patenting in *Association for Molecular Pathology v. Myriad Genetics*.[145] Myriad Genetics discovered the location and sequence of two genes, BRACA1 and BRACA2, that, when mutated, drastically increase the risk of breast and ovarian cancer.[146] Myriad Genetics claimed isolated DNA coding for various BRACA 1 and 2 sequences.[147] Simply separating the gene from its surrounding genetic material was an act of discovery, not invention, and thus not patentable.[148] *Chakrabarty* was differentiated because Myriad Genetics did not add any genetic information to a living organism.[149]

Diamond, *Bilski*, *O'Reilly*, *Gottschalk*, and *Mackay Radio* have been discussed previously[150] and will not be discussed further. It is important to note, however, that their citations in this case illustrates how the Court sees the Section 101 exceptions as a wholistic entity. This is key to the philosophical basis of the Section 101 exceptions and potential legislative strategies.[151]

Diamond v. Chakrabarty,[152] held that living things were patent eligible,[153] but continued to acknowledge the Section 101 exceptions.[154] A bacterium altered by the hand of man such that it broke down crude oil was eligible.[155] The law of relativity,[156] the law of gravity,[157] a newly discovered mineral,[158] and a wild plant,[159] however, were not patent eligible.

(1939); and Funk Brothers Seed Co. v. Kalo Inoculant Co.,333 U.S. 127, 130 (1948)).

[145] *See* Ass'n for Molecular Pathology et al. v. Myriad Genetics, Inc., 569 U.S. 576, 596 (2013).

[146] *Id*. at 582–83.

[147] *Id*. at 584.

[148] *Id*. at 592 n.4.

[149] *Id*. at 590–91.

[150] *See supra* Section II.

[151] *See infra* Section III.

[152] Diamond v. Chakrabarty, 447 U.S. 303 (1980).

[153] *See id*. at 310.

[154] *Id*. at 305, 310.

[155] *Id*. at 303, 310.

[156] *See id*. at 309.

[157] *See id*.

As discussed previously, the court separated out the obvious application from the natural principle in *Funk Brothers*.[160] The fact that some strains of Rhizobium did not kill each other was a law of nature.[161] No human had created the non-inhibitive strains of Rhizobium—nature had.[162] As such, there was no invention.[163]

The Telephone Cases[164] provide an early example showing the ineligibility of natural laws but the eligibility of applications of them.[165] The Court characterized Bell as claiming the manipulation of electricity in specific ways to carry sound[166] and not on the use of electricity itself.[167] The former was patent eligible.[168] The latter was not.[169]

Contrarily, the Court found the claims in *Morse* an attempt to patent a natural principle.[170] The Court went to great lengths in *Tilghman*,[171] where the court found a biological process patentable, as discussed previously,[172] to differentiate *Morse* from *The Telephone Cases*. Processes that applied natural laws were patentable while natural laws themselves were not.[173]

The Court's reasoning seems to point to some sort of physicality requirement. The Court analogized *Morse* to *Neilson v. Harford*.[174] The Court in *Tilghman* characterized the unpatentable principle in *Neilson* through its statement, "a hot-blast is better

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[158] *See id*.
[159] *See id*.
[160] *See* Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 131, 132 (1948).
[161] *Id*. at 130.
[162] *See id*. at 132.
[163] *See id.*
[164] Dolbear v. American Bell Tel. Co., 126 U.S. 1 (1888) [hereinafter "The Telephone Cases"].
[165] *See generally id.*
[166] *Id.* at 534.
[167] *Id*.
[168] *Id*. at 535.
[169] *Id*. at 534.
[170] *See* O'Reilly v. Morse, 56 U.S. 62, 113–17 (1853).
[171] Tilghman v. Proctor, 102 U.S. 707 (1880).
[172] *See id*. at 733–34.
[173] *See id*. at 722–23.
[174] Neilson v. Harford, 151 Eng. Rep. 1266 (1841).

than a cold blast for smelting iron."[175] What Neilson patented, however, according to the *Tilghman* Court, was the interposition of "a receptacle for heated air between the blowing apparatus and the furnace."[176] The *Tilghman* Court construed the claims in *Tilghman* and *Neilson* as claiming an application of the natural power rather than the power itself.[177] *Tilghman* and *Neilson*, however, have significant structure in their allowed claims.[178] *Tilghman* included a vessel strong enough to resist explosion while *Neilson* included a receptacle.[179]

This structural requirement may help explain the Court's hair splitting between *Flook* and *Diehr*. *Diehr* required a rubber-molding press, a database unique to each press and an apparatus capable of constantly determining the temperature of the mold cavity.[180] *Flook*, on the other hand, had no comparable apparatus limitations. Regardless, the key point here is that the Court discussed natural law patent ineligibility all the way back in the mid 1800's.[181]

As with *Alice*, *Le Roy* was cited by *Mayo* which established the modern understanding of the product of nature/natural law exception. Since the relevance of *Le Roy* as legal precedent for the abstract idea exception has already been discussed, the case will not be discussed here except to point out that it applies equally to the product of nature/natural law exception. The discussions of new powers can easily apply to natural products/natural laws, especially since the example the Court uses is steam. Like with the abstract idea exception, just because the lower courts, USPTO, and the Patent Bar miss the implications of precedent, does not mean the Supreme Court will.

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[175] *Tilghma*n, 102 U.S. at 724.
[176] *Id.*
[177] *Tilghman*, 102 U.S. at 726; *see also Neilson*, 151 Eng. Rep. at 1266.
[178] *See Tilghman*, 102 U.S. at 727; *see also Neilson*, 151 Eng. Rep. at 1266.
[179] *See Tilghman*, 102 U.S. at 714; *see also Neilson*, 151 Eng. Rep. at 1266.
[180] Diamond v. Diehr, 450 U.S. 175, 175 (1981).
[181] Parker v. Flook, 437 U.S. 584 (1978))

C. The Philosophical Underpinnings of the 101 Exceptions

As was noted in the previous section, the Supreme Court cites cases dealing with the abstract idea exception when finding something as ineligible as a Natural Law or Natural Product. This is because, as will be seen, the philosophical underpinning for all of the exceptions, according to the Court, is the same. So, this section, unlike the previous, will not be further subdivided.

According to the Court, the 101 exceptions are necessary to prevent the patenting of basic tools of scientific and technological work.[182] This is necessary because patenting these basic tools would "inhibit future innovation premised upon them."[183] Inhibiting innovation in this way would be against both the policy of the patent law and the "very point of patents."[184] The importance or excellence of the invention was irrelevant since "brilliant discovery does not by itself satisfy the § 101 inquiry."[185] The Court made this blatantly clear in *Alice*,[186] *Myraid*,[187] and *Mayo*.[188] In *Mayo*, the Court went so far as to characterize patent law as a "two-edged sword"[189] capable of both spurring and obstructing information flows.[190] *Bilski* echoed this same concern when it stated that courts must balance the "tension, ever present in patent law, between stimulating innovation by protecting inventors and impeding progress by granting patents when not justified by the statutory design."[191] Doing anything less would "put a chill on creative endeavor and dynamic change."[192]

This concern is not limited to the more modern 101 cases of the 21st century, however. *Flook* also turned on ensuring the use of

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[182] Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 587 (2013).
[183] *Id.* at 589.
[184] *Id.*
[185] *Id.* at 591.
[186] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 212 (2014).
[187] *Myriad*, 576 U.S. at 596.
[188] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 89 (2012).
[189] *Id.* at 92.
[190] *Id.*
[191] Bilski v. Kappos, 561 U.S. 593, 605–06 (2010).
[192] *Id.* at 608.

basic scientific building blocks was not preempted. Even though the claim was limited to the catalytic chemical conversion of hydrocarbons, this was not enough of a limit for the Court.[193] This is clearly articulated by the dissent's argument that limiting the claims to conversion of hydrocarbons prevented preemption.[194] Furthermore, the animating concern in *Gottschalk v. Benson* was how preventing the preemption of basic scientific building blocks is proven by a differentiation from *Corning*. In reference to *Corning*, the Court in *Gottschalk* remarked that "[t]he chemical process or the physical acts which transform the raw material are [in *Corning*], however, sufficiently definite to confine the patent monopoly within rather definite bounds."[195] Thus, the claims in *Corning* could be allowed, but since *Gottschalk* lacked such definite chemical processes or physical acts, its claims could not.

This same concern can be traced back to the 19th century. *Gottschalk* noted how Bell did not claim "all telephonic use of electricity."[196] In the Telephone Cases, the Court noted this themselves when they stated that Bell's claims were not for "the use of a current of electricity in its natural state,"[197] but rather a continuous circuit of electricity in a closed circuit "into a certain specified condition[] suited to the transmission of vocal and other sounds."[198] Even in the two earliest cases that arguably established the judicial exceptions—*Morse* and *Le Roy*[199]—extensive preemption of later discoveries and interference with patent law policy was the issue. *Morse*'s claims were invalid since they would prevent inventors of improvements from practicing those improvements.[200] Le Roy's claims were invalid since a contrary holding "by creating monopolies, would discourage arts and

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[193] Parker v. Flook, 437 U.S. 584, 586 (1978).

[194] *Id*. at 599–600 (Stewart, J., dissenting).

[195] Gottschalk v. Benson, 409 U.S. 63, 69 (1972) (referencing Corning v. Burden, 56 U.S. 252, 267 (1853)).

[196] *Id.*

[197] Dolbear v. Am. Bell Tel. Co., 126 U.S. 1, 534, 535 (1888).

[198] *Id*. at 534.

[199] *See* O'Reilly v. Morse, 56 U.S. 62, 62 (1853); Le Roy v. Tetham, 55 U.S. 156, 156 (1852).

[200] *See Morse*, 56 U.S. at 113–14.

manufactures, against the avowed policy of the patent laws."[201] The 101 exceptions exist because the Court believes, and has since the late 1800s, that they are necessary to prevent patent law from inhibiting as opposed to promoting scientific advancement.

III. WHY THE CURRENT LEGISLATIVE FIX IS DOOMED

As the previous discussion shows, the Section 101 exceptions have been around at least since 1852.[202] What may not be as obvious, but becomes clear with a little discernment, is that the Supreme Court did not invent the exceptions without "support anywhere in the law . . . out of whole cloth."[203] As explained above, the Court consistently based the Section 101 exceptions on ensuring patent law encouraged, rather than discouraged, innovation. The constitutional connection has not been stated directly. The Court has never held The Patent Act unconstitutional. The Constitution grants Congress the power to write patent laws. Article 1 Section 8 of the Constitution reads in part: "The Congress shall have the Power to . . . promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[204]

The connection should now be obvious to even the most casual, intellectually honest observer. The Court believes the Constitution limits Congress's power to implement patent law. Patent law can only be enacted when it promotes the progress of science and the useful arts, and the Section 101 exceptions are necessary to ensure current patent law meets this requirement. The Court did not quote this clause when referring to eligibility concerns until relatively modern times,[205] but the Court stated in *Le*

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[201] *Le Roy*, 55 U.S. at 175.

[202] *See supra* notes 197–99 and accompanying text (exceptions may have been around even earlier in the decisions of lower courts).

[203] Gene Quinn, *Mayo v. Prometheus: A Lawless Decision by an Omnipotent Court Wreaking Havoc on Patents*, IPWATCHDOG (Jan. 23, 2017), https://www.ipwatchdog.com/2017/01/23/mayo-v-prometheus-lawless-decision-wreaking-havoc-patents/id=77438/ [https://perma.cc/Q6MN-H7MS].

[204] U.S. CONST. art I, § 8, cl. 8.

[205] *See* Diamond v. Diehr, 450 U.S. 175, 181 (1981).

Roy that allowing the disputed claims "would discourage arts and manufactures, *against the avowed policy of the patent laws*."[206] The Court invalidated Morse's patent largely because the Court believed allowing it would inhibit development of improvements.[207] *Tilghman* reiterated the importance of this holding by quoting it extensively.[208] Specifically, the Court noted positively that *Tilghman* did not "claim every mode"[209] of separating fatty acids and glycerin using water.[210] *Expanded Metal Co.* acknowledged the importance of considering the patent laws' "object and purpose."[211]

The modern cases make the connection between the Constitution and the Section 101 exceptions even more explicit. *Chakrabarty* began its decision by directly stating:

> The Constitution grants Congress broad power to legislate to "Promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." The patent laws promote this progress by offering inventors exclusive rights for a limited period as an incentive for their inventiveness and research efforts.[212]

Bilski states that the Section 101 exceptions "serve a critical role in adjusting the tension, ever present in patent law, between stimulating innovation . . . and impeding progress."[213] The Section 101 exceptions keep patent law from "put[ing] a chill on creative endeavor[s] and dynamic change[s]."[214] This thread continued in *Mayo* where the Court characterized patent law as a "two-edged sword"[215] that had to be prevented from "inhibit[ing] further discovery."[216] In *Myriad,* the Court stated that the Section 101

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[206] Le Roy v. Tatham, 55 U.S. 156, 175 (1852) (emphasis added).
[207] *See* O'Reilly v. Morse, 56 U.S. 62, 113–14 (1853).
[208] Tilghman v. Proctor*,* 102 U.S. 707, 727 (1880).
[209] *Id*. at 729.
[210] *Id*.
[211] Expanded Metal Co. v. Bradford, 214 U.S. 366, 382 (1909).
[212] Diamond v. Chakrabarty, 447 U.S. 303, 307 (1980) (quoting U.S. CONST. art. I, § 8, cl. 8).
[213] Bilski v. Kappos, 561 U.S. 593, 609 (2010).
[214] *Id*. at 608.
[215] Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 92 (2012).
[216] *Id*. at 85.

exceptions were necessary because they prevented the "inhibit[ion] [of] future innovation"[217] by averting the "tie[ing] up"[218] of "basic tools of scientific and technological work."[219] In *Alice*, the Court grounded the Section 101 exceptions most strongly in the Constitution when it stated:

> We have described the concern that drives this exclusionary principle as one of pre-emption . . . Laws of nature, natural phenomena, and abstract ideas are "the basic tools of scientific and technological work." "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it," thereby thwarting the primary object of the patent laws. (Congress "shall have Power . . . To promote the Progress of Science and useful Arts"). We have "repeatedly emphasized this . . . concern that patent law not inhibit further discovery by improperly tying up the future use of" these building blocks of human ingenuity.[220]

Even in cases that do not touch directly on the Section 101 exceptions, the Court has emphasized the importance of ensuring the patent laws don't inhibit innovation. American patent law rests on "the need to promote innovation,"[221] due to the cost in time and money of research and development.[222] However, the patent clause "is both a grant of power and a limitation."[223] Congress "may not overreach the restraints imposed by the stated constitutional purpose,"[224] nor may the patent monopoly be enlarged "without regard to the innovation, advancement or social benefit gained thereby,"[225] and the "*standard* expressed in the Constitution . . . may not be ignored."[226] It could be argued, of course, that the

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[217] Ass'n for Molecular Pathology et al. v. Myriad Genetics, Inc., 569 U.S. 576, 589 (2013) (quoting *Mayo*, 556 U.S. at 86).

[218] *Id*.

[219] *Id.* (quoting *Mayo*, 556 U.S. at 71).

[220] Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 216 (2014) (quoting U.S. CONST. art. I, § 8, cl. 8; Mayo, 556 U.S. at 71–85; *Myriad*, 569 U.S. at 589).

[221] Bonito Boats Inc. v. Thunder Craft Boats Inc., 489 U.S. 141, 146 (1989).

[222] Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 482 (1974); *see also* Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1017 (1989).

[223] Graham v. John Deere Co., 383 U.S. 1, 5 (1966).

[224] *Id.* at 5–6.

[225] *Id.* at 6.

[226] *Id.* (emphasis in original).

statements in *Kewanee Oil, Bonito Boats,* and *John Deere* are dictum.[227] However, the Courts exhortation not to read conditions and limitations into patent law that lacks legislative support, which has been used to support expansive patent rights, was taken from a case dealing with shop rights and assignment.[228] In a world where the Supreme Court can make dictum non-dictum at any time, treating Supreme Court cases as if they contain no dictum seems the safer course. Furthermore, the Supreme Court has a habit of quietly overturning itself. In *Expanded Metal Co.*, the Court held that "a process or method involving mechanical operations, and producing a new and useful result" is patentable,[229] while *Risdon Iron* held that the only patentable processes were chemical in nature or used a natural force such as electricity.[230] In *Expanded Metal Co.*, the Court stated it would not question the decision in

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[227] None of these three cases dealt with eligibility under § 101. *Bonito Boats* concerned the ability of states to offer protection to utilitarian and design ideas outside of the federal scheme. *See* Bonito Boats Inc. v. Thunder Craft Boats Inc., 489 U.S. 141, 143 (1989). *Kewanee Oil* dealt with federal preemption of state trade secret law. *See Kewanee Oil*, 416 U.S. at 480. *John Deere* arguably dealt with the requirement of obviousness. for patentability. *See John Deere*, 383 U.S. at 3, 14–15, 17–19. *But see id.* at 3–4, 16–17 ("After a lapse of 15 years, the Court again focuses its attention on the patentability of inventions under the standard of Art. 1, § 8, cl. 8, of the Constitution . . . We have concluded that the 1952 Act was intended to codify judicial precedents embracing the principle long ago announced by this Court in *Hotchkiss v. Greenwood*, [], and that, while the clear language of § 103 places emphasis on an inquiry into obviousness, the general level of innovation necessary to sustain patentability remains the same . . . [i]t is contended, however, by some of the parties and by several of the *amici* that the first sentence of § 103 was intended to sweep away judicial precedents and to lower the level of patentability . . . We believe that this legislative history, as well as other sources, shows that the revision was not intended by Congress to change the general level of patentable invention."). These quotes tend to imply that something more than obviousness under Section 103 is being discussed here.

[228] Diamond v. Chakrabarty, 447 U.S. 303, 308 (1980); United States v. Dubliner Condenser Corp., 289 U.S. 178, 182 (1933) ("The prayers are for a declaration that the respondent is a trustee for the government, and, as such, required to assign to the United States all its right, title, and interest in the patents.").

[229] Expanded Metal Co. v. Bradford, 214 U.S. 366, 385–86 (1909).

[230] *See* Risdon Iron & Locomotive Works v. Medart, 158 U.S. 68, 77 (1895).

Risdon[231] and the syllabus simply stated that *Risdon* was "distinguished."[232] This is common Supreme Court practice.[233]

Let me be blunt. For reasons I will lay out in detail below, I abjectly disagree with the Supreme Court reasoning cited in many of these cases. Patenting natural products, natural processes, and abstract ideas does not inhibit the progress of science. Removing the economic incentive, as the Supreme Court has for research around natural products, natural processes, and abstract ideas does inhibit science. It can also certainly be argued that the Constitution does not inhibit Congress's power the way the Supreme Court thinks it does. Further, it is in my economic interest to convince people that the Supreme Court invented the exceptions without "support anywhere in the law," creating them "out of whole cloth without any authority."[234]

However, this does not mean I can ignore the obvious Section 101 exception precedent, the clear philosophical basis for that precedent, or what that means for the proposed changes to Section 101. Doing so would be (1) intellectually dishonest, (2) require me to ignore what I know about the Supreme Court's treatment of precedent, or (3) require me to ignore what I know to be true because it suits my economic interests. Legal and personal ethics, along with my inner sense of morality makes this impossible.[235]

Where does this leave the proposed Section 101 changes? As the above discussion proves, the Supreme Court did not invent the 101 exceptions without support. The exceptions go back at least

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[231] *Expanded Metal*, 214 U.S. at 382.

[232] *Id.* at 366.

[233] *See, e.g.*, Wickard v. Filburn, 317 U.S. 111 (1942) (arguably overturning precedent dating back 100 years when the court decided *Gibbons v. Ogden* in 1824).

[234] Quinn, *supra* note 201.

[235] *But see id.*; Gene Quinn, *Does the Supreme Court Even Appreciate the Patent Eligibility Chaos They Created*?, IPWATCHDOG (Nov. 12, 2018), https://www.ipwatchdog.com/2018/11/12/103256/id=103256/ [https://perma.cc/NG6W-8VMF]; Gene Quinn, *Sherry Knowles Scrutinizes an Activist Supreme Court and its Unconstitutional Approach to Patent Eligibility*, IPWATCHDOG (Jan. 16, 2019), https://www.ipwatchdog.com/2019/01/16/sherry-knowles-scrutinizes-activist-supreme-court-unconstitutional-patent-eligibility/id=105228/ [https://perma.cc/8HTF-6QQ7].

one-hundred and sixty-seven years, and are based in *Le Roy*, which based their existence on patent law's public policy foundations as expressed in the Constitution's Patent Clause. The exceptions constitutional foundation was recognized in both *Le Roy's* historical and modern progeny as well as in unrelated historical and modern cases. The proposed changes directly abolish the exceptions.[236] If the language is passed "as is," the Court is likely to find the amended clause unconstitutional. Citing *Le Roy, Morse, Tilghman, Expanded Metal, Flook, Chakrabarty, Bilski, Mayo,* and *Alice,* the Court would likely overtly ground the exceptions in the Constitution. If the Court felt the need for additional support, it would likely cite *Bonito Boats, Kewanee Oil,* and *Graham v. John Deere*. Certainly, counter-arguments exist, some of which will be discussed in the section below, but the best way forward is not by disregarding clear legal precedent, but rather by remembering that Article I, Section 8, clause 8 is not the only part of the Constitution that intellectual property law is based on.

A. How to Overcome the 101 Exceptions

Perhaps the most obvious argument against finding the proposed changes to Section 101 unconstitutional, is that they will not decrease the advancement of science and the useful arts. Evidence the proposed changes will not decrease advancements certainly exists, especially in the biotechnology space.[237] However, counter-evidence also exists. For example, the effects of the exceptions on software and internet technologies is not as pronounced as in the biotechnology space.[238] Moreover, presidential commissions have argued against the patenting of computer programs,[239] and much economic research questions the success or necessity of patent based incentives.[240] Certainly further

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[236] *See supra.*

[237] *See* Introduction; *see also supra* text accompanying notes 5, 23, 26–28.

[238] *See* Introduction; *see also supra* and text accompanying note 29.

[239] *See* Gottschalk v. Benson, 409 U.S. 63, 72 (1972).

[240] *See, e.g* RICHARD POSNER, ECONOMIC ANALYSIS OF LAW 54 (Little Brown, 2nd ed. 1977); ABBOT P. USHER, A HISTORY OF MECHANICAL INVENTIONS 1–31, (McGraw Hill, 1st ed. 1929); Frederic M. Scherer, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 384–87 (Rand McNally, 1970); Martin J. Adelman, *The Supreme Court, Market Structure and Innovation:*

counter-evidence supporting the necessity of patent incentives also exists.[241] The difference in incentives' necessity in the computer and biotech space is especially noteworthy given the above discussion of the Supreme Court's application of reasoning from "natural product" and "natural process" cases to the "abstract ideas" cases.[242] The Court is unlikely to apply the exceptions differently based on technological sector.

If the Court uses the Constitution to invalidate the new law, why not consider revising the Constitution? The Constitution was last successfully amended in 1992 by an amendment originally proposed in 1789.[243] Amending the Constitution requires that an amendment first be proposed by "two thirds of both Houses,"[244] or during a constitutional convention called by "the Legislatures of two thirds of the several States."[245] Ratification of a proposed amendment requires ratification by the legislatures of three fourths of the several States[246] or ratification by constitutional conventions in three fourths of the several States.[247] Achieving this level of unanimity is difficult even in the best of times. This is why the Constitution has only been amended 27 times in its one-hundred-and-thirty-one-year history.

Chakrabarty Rohm and Haas 27 ANTITRUST BULL. 457, 458–60 (1982); Eisenberg, *supra* note 220; Alfred E. Kahn, *Fundamental Deficiencies of the American Patent Law*, 30 AM. ECON. REV. 475, 479–81 (1940); Michael Polanyi, *Patent Reform*, 11 REV. OF ECON. STUD. 61, 65 (1944).

[241] *See, e.g., supra* section 1; WARD S. BOWMAN JR., PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL 2–3 (Chicago 1973); KENNETH J. ARROW, ECONOMIC WELFARE AND THE ALLOCATION OF RESOURCES FOR INVENTION 619 (Nat'l Bureau of Econ. Res.); William F. Baxter, *Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis,* 76 YALE L. J. 267, 268–69 (1966); Eisenberg, *supra* note 220, at 1017, 1024–27; Edwin Mansfield et al. *Social and Private Rates of Return from Industrial Innovations,* 91 QJ ECON. 221, 233–34 (1977).

[242] *See supra* Section II.

[243] Steven G. Calabresi & Zephyr Teachout, *The Twenty-Seventh Amendment*, NAT'L CONST. CTR., https://constitutioncenter.org/interactive-constitution/interpretation/amendment-xxvii/interps/165 [https://perma.cc/3575-PP79].

[244] U.S CONST. art. 5.

[245] *Id.*

[246] *Id.*

[247] *Id.*

As an example of the above, in 2010, the Supreme Court decided that limiting the amount of money corporations could donate to political causes violated the First Amendment.[248] The decision became controversial almost instantly. A 2018 University of Maryland study[249] found that three fourths of respondents overall, 66 percent of Republicans and 85 percent of Democrats, wanted to overturn *Citizens United* with a constitutional amendment.[250] An admittedly smaller Bloomberg poll[251] in 2015, found that 78 percent of respondents wanted the ruling overturned.[252] Multiple groups such as Public Citizen,[253] Common Cause,[254] and The Stamp Stampede[255] are mobilizing to propose a constitutional amendment. Multiple celebrities and well-known

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[248] *See* Citizens United v. Fed. Election Comm'n, 558 U.S. 310 (2010).

[249] Steven Kull et al., *Americans Evaluate Campaign Finance Reform Program*, PROGRAM FOR PUB. CONSULTATION (May 2018), https://www.documentcloud.org/documents/4455238-campaignfinancereport.html [https://perma.cc/PMX7-NS3Y].

[250] *Id.*; Ashley Balcerzak, *Study: Most Americans want to kill 'Citizens United' with constitutional amendment*, PUB. RADIO INT'L (May 10, 2018), https://www.pri.org/stories/2018-05-10/study-most-americans-want-kill-citizens-united-constitutional-amendment [https://perma.cc/GS5Y-F7J2].

[251] *See* Cristian Farias, *Americans Agree on One Thing: Citizens United is Terrible*, HUFFPOST (Sept. 29, 2015), https://www.huffpost.com/entry/citizens-united-john-roberts_n_560acd0ce4b0af3706de129d [https://perma.cc/6VTW-E56C]. The noted Bloomberg poll had only 1001 participants.

[252] *Id.*; *see also* Greg Stohr, *Bloomberg Poll: Americans Want Supreme Court to Turn Off Political Spending Spigot*, BLOOMBERG (Sept. 28, 2015), https://www.bloomberg.com/news/articles/2015-09-28/bloomberg-poll-americans-want-supreme-court-to-turn-off-political-spending-spigot [https://perma.cc/97B5-2YLT].

[253] PUBLIC CITIZEN, https://www.citizen.org/ [https://perma.cc/LZH2-Q3M3] (last visited Mar. 11, 2020).

[254] *Amend the Constitution to Overturn Citizens United*, COMMON CAUSE, https://actionnetwork.org/petitions/amend-the-constitution-to-overturn-citizens-united?source=takeactionpanel&_ga=2.233513502.1865421674.1562184607-1253684198.1562184607 [https://perma.cc/7SH6-NS68] (last visited Mar. 11, 2020).

[255] *Overturn Citizens United*, THE STAMP STAMPEDE, https://www.stampstampede.org/money-out-voters-in/overturn-citizens-united/ [https://perma.cc/KY4A-KQ3X] (last visited Mar. 11, 2020).

politicians such as George Clooney,[256] Rosario Dawson,[257] and Bernie Sanders[258] have all come out in support of a constitutional amendment overturning *Citizens United*. So, the movement is not lacking in star power. Still though, while constitutional amendments have been proposed in Congress,[259] none have passed either house. If a Supreme Court decision that arguably 78 percent of the population disagrees with cannot be overturned by constitutional amendment, overturning a group of decisions supported by over 150 years of precedent[260] and powerful non-governmental interests is likely an impossibility.

In a related proposal, an attempt could be made to convince the Court that the first clause of Article 1 Section 8 Clause 8 does not limit the second clause. This would be like the winning argument in *District of Columbia v. Heller*,[261] where the first clause of the Second Amendment was held to be a non-limiting prefatory clause.[262] Since such a decision would go against over 150 years of precedent,[263] this argument too is unlikely to succeed.

All is not lost, however, as the Patent Clause is not the only constitutional power under which the government can grant monopolies. In the *Trademark Cases*,[264] the Court found the

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[256] Reena Flores, *George Clooney talks "obscene" money in politics*, CBS NEWS (Apr. 17, 2016), https://www.cbsnews.com/news/george-clooney-political-fundraisers-cost-an-obscene-amount-of-money/ [https://perma.cc/7YWG-74QX].

[257] Danielle Odiamar, *Rosario Dawson Arrested While Protesting in a Bernie Sanders Jacket*, MARIE CLAIRE (Apr. 18, 2016), https://www.marieclaire.com/celebrity/a19960/rosario-dawson-arrested-bernie-sanders/ [https://perma.cc/2DKV-WSWL].

[258] Bernie Sanders, *Get Big Money Out of Politics and Restore Democracy*, https://berniesanders.com/issues/get-big-money-out-of-politics-and-restore-democracy/ [https://perma.cc/66A3-R3X9] (last visited Mar. 11, 2020).

[259] *See e.g.,* Rachel Frazin, *Schiff introduces constitutional amendment to overturn Citizens United*, THE HILL (May 8, 2019), https://thehill.com/homenews/house/442697-schiff-introduces-constitutional-amendment-to-overturn-citizens-united [https://perma.cc/H93Z-D4WQ].

[260] *See supra*.

[261] District of Columbia v. Heller, 554 U.S. 570 (2008).

[262] *Id.*

[263] *See supra* Section II.

[264] In re Trademark Cases, 100 U.S. 82 (1879).

government had the power "to establish the conditions on which these rights shall be enjoyed and exercised, the period of their duration, and the legal remedies for their enforcement"[265] under the Commerce Clause if the act was limited to "commerce with foreign nations, commerce among the States, and commerce with the Indian tribes."[266] Trademark law is currently so limited.[267] There is no reason that a patent law specifically making products of nature, natural phenomena, and abstract ideas, patentable could not be similarly upheld under the Commerce Clause.

It could be argued that the *Trademark Cases* allow enactment of a law simply not enabled, rather than nullified by the Patent Clause.[268] The Court did state "we are unable to see [in the Patent Clause] any such power."[269] This does seem to imply that the Patent Clause neither allows nor prevents the enactment of trademark legislation. As explained above, the Court is likely to hold that the Patent Clause prevents enactment of patent laws negating the judicial exceptions.[270] However, in *National Federation of Independent Business v. Sebelius*,[271] the government stated that the Commerce Clause prevented the government from compelling commerce and thus imposing a penalty on those who didn't buy health insurance.[272] The individual mandate was "not consistent with the letter and spirit of the constitution."[273] It was an "act[] of usurpation"[274] and "deserve[d] to be treated as such."[275] The individual mandate was, however, constitutional under Congress's power to tax.[276]

This legal reasoning shows a practical yet honest way forward. Congress should acknowledge, without agreeing with, the Court's

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[265] *Id*. at 93.
[266] *Id.* at 96.
[267] *See* 15 U.S.C. § 1127 (2018).
[268] *See* Trademark Cases, 100 U.S. at 94.
[269] *Id.*
[270] *See supra* Section II.
[271] Nat'l Fed'n of Indep. Bus. v. Sebelius, 567 U.S. 519, 522–24 (2012).
[272] *See id.*
[273] *Id.* at 654 (internal quotations omitted).
[274] *Id.* at 559 (internal quotations omitted).
[275] *Id.*
[276] *Id.* at 562.

position that the Patent Clause prevents the patenting of natural products, natural processes, and abstract ideas. Congress should then make a law overturning these exceptions and blatantly rely on the Commerce Clause to do so. *Sebelius* can be used to defeat the argument that one enumerated power cannot allow what another enumerated power prohibits. In a world where an act of Congress can be prevented by one clause of the Constitution in the strongest possible terms but allowed by another, a law only arguably prevented by the Patent Clause could be allowed by the Commerce Clause.

IV. CONCLUSION

Alice and *Mayo* are based on precedent going back at least 150 years. Consistently from *Le Roy* to *Mayo* and *Alice*, the Court based the Section 101 exceptions on the need to prevent patent law from inhibiting innovation. A direct line can be drawn from this reasoning to U.S. Constitution article 1, section 8, clause 8. This clause has historically been used as the basis for Congress enacting patent law. The current legislative changes to Section 101 are a blatant attempt to overturn the decisions establishing the judicial exceptions to Section 101. Given that the Court bases these exceptions on U.S. Constitution article 1, section 8, clause 8 the Court is likely to find the amended Section 101 unconstitutional. To avoid this, Congress should explicitly base the amendments, and thus all of patent law, on the Constitution's Commerce Clause. The argument that one part of the constitution cannot allow what another part forbids can be negated using *Sebelius*.