
PATENTING ARTIFICIAL INTELLIGENCE:
AN ADMINISTRATIVE LOOK INTO THE
FUTURE OF PATENT LAW

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Introduction

The overwhelming breadth of technology is expanding exponentially each year, with yesterday's science fiction novels becoming today's newest breakthroughs.¹ Along with these constant technological advances we are forced to examine the reliability of our laws and ensure that they are still applicable today. This idea is particularly true in the area of patent law.

Under the United States Constitution, Congress has the power to “[t]o promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”² This clause established the patent as a substantive vehicle for inventors to prevent unauthorized use of their hard-earned inventive works.³ Accordingly, the United States Patent and Trademark Office (“PTO”) was put in place by Congress as the administrative body responsible for granting exclusionary patent rights to inventors throughout the country.⁴ As technology races forward, the statutory definition for what is or is not patentable subject matter is constantly being reinterpreted by the Federal Circuit Court and Supreme Court.⁵ Perhaps one of the fastest

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¹ See ORSON SCOTT CARD, *ENDER'S GAME 5* (Tom Doherty Assoc., LLC, 1st ed. 1985) (describing a monitor-like apparatus that closely resembles today's tablets).

² See U.S. CONST. art. I, § 8, cl. 8 (specifying Congress's power to regulate patents and copyrights).

³ See *General information concerning patents*, USPTO (Oct. 2015), archived at <https://perma.cc/566J-CQ6M> (explaining that the Constitution gave rise to patents and copyrights, which protect ownership of innovative materials).

⁴ See Establishment, 35 U.S.C. § 1(a) (2000) (establishing the PTO and describing its officers and functions).

⁵ See Inventions patentable, 35 U.S.C. § 101 (1952) (providing the statutory definition for patentable inventions); see also *Alice v. CLS Bank Int'l*, 573 U.S. 208, 212 (2014) (discussing the patentability of software); *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 595 (2013) (discussing the patentability of

growing areas of technology is the rapid development of artificial intelligence (AI) systems, which will certainly create a dramatic shift in how we interact with the world around us.⁶ The patentability of these AI systems is also becoming an important facet of the law as inventors race to not only implement these systems into all aspects of everyday life, but also maintain ownership and receive just compensation for the various costs associated with their conception.⁷

Despite the myriad of potential uses, the primary concern underlying AI patentability is whether such an invention qualifies as patentable subject matter under 35 U.S.C. §101.⁸ While this decision is traditionally left to the judicial discretion of the Federal Circuit Court, there has been a recent push to expand the substantive authority of the PTO, and grant it greater administrative and judicial deference which could play a large part in future subject matter litigation.⁹

DNA); *Mayo Collaborative Servs. v. Prometheus Laboratories*, 566 U.S. 66, 91 (2012) (discussing the patentability of life).

⁶ See J.H. Abawajy, *Human-computer interaction in ubiquitous computing environments*, 5 INT'L J. PERVASIVE COMPUTING & COMM. 61, 68 (2009) (explaining the pervasiveness of technology in our society and possible ways to further integrate computers into our lives); see also Ted Goertzel, *The path to more general artificial intelligence*, 26 J. EXPERIMENTAL & THEORETICAL ARTIFICIAL INTELLIGENCE 343, 351 (2014) (discussing AI implementation in the medical field, police investigatory matters, self-driving cars, judicial prediction, etc.); see also Ephraim Nissan, *Digital technologies and artificial intelligence's present and foreseeable impact on lawyering, judging, policing and law enforcement*, 32 AI & SOC'Y 441, 441 (2015) (providing the history of AI law).

⁷ See Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 344 (2010) (discussing many of the primary economic incentives underlying the patent system).

⁸ See 35 U.S.C. § 101 (describing which inventions that can be patented including "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof").

⁹ See Brief for Respondent at 11, *Oil State Energy Services v. Greene's Energy Group*, 138 S. Ct. 1365 (2018) (No. 16-712) (arguing that Inter Partes Review is constitutional); see also Leahy-Smith America Invents Act, H.R. 1249, 112th Cong. §§ 6, 18 (2011) (proposing establishment of the AIA, IPR, and PGR); Michael J. Burstein, *Rules for Patents*, 52 WM. & MARY L. REV. 1747, 1755 (2011) (acknowledging that the PTO is primarily a body for granting or denying patent applications); Jonathan S. Masur, *Regulating Patents*, 2010 SUP. CT. REV. 275, 305 (2010) (explaining that the PTO is "involved in overseeing the PTO's regulatory actions, adjudicating infringement actions and appeals from the PTO, and making policy where the PTO has not yet acted."). The push for greater administrative power is likely the result of the America Invents Act's (AIA) creation of Inter Partes Review (IPR), Post-Grant Review (PGR), and the Transitional Program for Covered Business Methods (TPCBM) as appellate vehicles for those looking to challenge

To determine the patentability of AI systems, Part I of this Comment examines the functionality of AI, its prevalence as an emerging technology in society.¹⁰ Part II discusses the elements that must be satisfied under 35 U.S.C. § 101 in order for AI to be patentable in the eyes of the courts.¹¹ Part III discusses potential administrative changes and the granting of greater judicial deference to the PTO through the Supreme Court's recent decision in *Oil States*.¹² Finally, Part IV details an alternative method through which the PTO could expand its authority should the Court narrowly interpret the *Oil States* holding in the future, and how future AI patents may fit into this scheme.¹³

I. The Functionality and Patentability of Artificial Intelligence

A. What is an Artificial Intelligence System?

For many the words “Artificial Intelligence” conjure up images of a far-off dystopian future where computers have become indistinguishable from humans.¹⁴ While this very well could be where we as a species are heading, today the field is much more optimistic and not so reliant on science fiction tropes.¹⁵ Today, AI is recognized as a subfield of computer science which seeks to simulate an expansion

patents. *Id.*; Brian E. Mack, *PTO Rulemaking in the Twenty-First Century: Defining the Line Between Strategic Planning and Abuse of Authority*, 75 *FORDHAM L. REV.* 2105, 2115 (2007) (discussing the PTO's development of new rules, including the two rules that limit “both the number of continuing applications and the number of claims in each application” which caps the total number of claims for each invention).

¹⁰ See *infra* Part I.

¹¹ See *infra* Part II.

¹² See *infra* Part III.

¹³ See *infra* Part IV.

¹⁴ See Abawajy, *supra* note 6, at 2 (explaining computing has been “woven into the fabric of human society” known as pervasive computing).

¹⁵ See Abawajy, *supra* note 6, at 3 (emphasizing the goal with pervasive computing is to allow users to be able to interact naturally with computers in the same face-to-face communication occurs between humans).

and extension of the human mind through computerized neural networks.¹⁶

In the last fifty years, AI has seen tremendous advancement from being able to play chess, to being the seminal technology found in self-driving cars.¹⁷ Most often AI systems are designed to simulate human sensory perception through the implementation of specialized algorithms which allow the machine to “learn” and adapt to the problem it is given.¹⁸ The various methods of developing computational intelligence can be separated into three main categories: neural networks, fuzzy systems, and genetic algorithms.¹⁹

Neural networks are large conglomerates of artificial neurons that are analogous to biological neurons in their structure and function.²⁰ Each artificial neuron within the computer system is designed to have a biological counterpart which simulates how a human’s neurological network would function.²¹ By utilizing computerized neural networks, large sets of complex data can be analyzed more similarly to how the human brain analyzes the world around it, thus allowing the computer system to “learn” accordingly.²²

Fuzzy systems create an algorithm for the computer system which rely on computational “uncertainties” to map decisions and learn.²³ Most computers analyze data in a true/false, yes/no structure

¹⁶ See Zhong-Zhi Shi & Nan-Ning Zheng, *Progress and Challenge of Artificial Intelligence*, 21 J. COMPUT. SCI. & TECH. 810, 810 (2006) (introducing the concept of AI and the concerns of the field).

¹⁷ See *id.* (discussing the advancements in AI in the past 50 years).

¹⁸ See *id.* at 814 (explaining how AI mimics the intelligent functioning of a human being).

¹⁹ See Iulia Maries & Emil Scarlat, *Computational Intelligence Techniques for Communities Network Formation*, 41 COMPUTATIONAL INTELLIGENCE TECH. 599, 601 (2012) (listing the different types of computational intelligence techniques).

²⁰ See *id.* at 600 (offering a detailed definition of neural networks).

²¹ See *id.* at 601 (explaining how artificial neurons mimic a biological counterpart).

²² See *id.* (detailing how AI systems which utilize neural networking attempt to emulate the human brain’s process of receiving sensory information from the body’s organs (eyes, nose, skin, etc.) and making decisions based on the information received); see also Yixin Zhong, *Structuralism? Functionalism? Behaviorism? Or Mechanism? Looking for a Better Approach to AI*, 1 INT’L J. INTELLIGENT COMPUTING & CYBERNETICS 325, 328 (2008) (explaining how fuzzy systems use mathematical evaluations to apply human-like thinking in computer programming).

²³ See Maries & Scarlat, *supra* note 19, at 601 (describing fuzzy systems as a framework of sets that provide an increased applicability in different fields).

using Boolean logic.²⁴ Using fuzzy logic allows the computer to evaluate data that may be considered uncertain at the time, and thus registers it differently than it would if a simple true/false problem arose.²⁵ Being able to analyze these uncertainties helps simulate human mental processes further and advances the overall goal of AI systems.²⁶

Finally, genetic algorithms may be used to simulate the evolution and mutation of chromosomes themselves in an attempt to create a constantly adapting computerized intelligence network.²⁷ These algorithms function by assigning variables to act as simulated chromosomes which are then able to “reproduce” based on the number of favorable computational results which that “chromosome” has obtained.²⁸ This algorithmic process is repeated again and again until the most successful variables and processes are mapped out to solve that particular problem.²⁹

While this information is dense and deeply rooted in the realm

²⁴ See Harry Fairhead, *Introduction to Boolean Logic*, I-PROGRAMMER (Sept. 28, 2018), *archived at* <https://perma.cc/FDH9-6ETT> (explaining in the realm of Boolean logic, a statement can only be true or false; nothing in between exists when stringing these statements together one may utilize a combination of fundamental operators such as AND, OR, or NOT to create strings of logic sequences that are ultimately evaluated as either true or false statements). This binary approach to logic is precisely how most computers function and operate at a fundamental level. *Id.*; Maries & Scarlet, *supra* note 19, at 601 (detailing fuzzy systems’ capability to allow for intermediate values to be defined as conventional evaluations).

²⁵ See Maries & Scarlet, *supra* note 19, at 601 (elaborating on the human-like way of thinking involved in fuzzy systems).

²⁶ See Maries & Scarlet, *supra* note 19, at 601 (providing that “[t]he purpose of fuzzy transformation, through fuzzification process, is to convert an analogue variable input into a set of fuzzy variables”). Human behavior is inherently non-binary, and therefore, the ability to teach a computer to analyze such situations is extremely important if we ever hope to perfectly replicate the human learning and thought processes found in activities such as driving, medical practice, and even playing games. *Id.*

²⁷ See Maries & Scarlet, *supra* note 19, at 601-02 (highlighting the processes involved in creating a genetic algorithm).

²⁸ See Maries & Scarlet, *supra* note 19, at 602 (detailing the second step of the genetic algorithm: selecting the best members of the population).

²⁹ See Maries & Scarlet, *supra* note 19 (Noting that “[a]lmost always, the genetic algorithm leads to a good solution, but sometimes too many generations are required.”).

of computer science, it is important to understand the end result.³⁰ Through the simulation of human intelligence utilizing a variety of the methods and algorithms discussed above, we are able to apply these problem-solving machines to a variety of real-world processes in an attempt to automate and further refine the world around us.³¹ As technology continues to rush by us the applications of AI systems truly seem endless.³²

B. Why Patent Artificial Intelligence?

Patents represent exclusionary property rights for an inventor.³³ The patent prevents others from copying the inventor's work and allows him to profit from the technology which he has invented, thus providing a global incentive to invent and improve upon technologies.³⁴ These concepts are especially important in the field of AI as society becomes more and more saturated with these systems

³⁰ See Nicole Black, *Legal Research and AI: Looking Toward the Future*, ABOVE THE LAW (Jul. 27, 2017), archived at <https://perma.cc/E6ND-KZ4Z> (different platforms yield different results based on identical queries).

³¹ See *id.* (proposing that artificial intelligence can reduce the amount of time they spend on research, allowing them to spend more time on other aspects of their work).

³² See Julie Sobowale, *How Artificial Intelligence is Transforming the Legal Profession*, ABA J. (Apr. 2016), archived at <https://perma.cc/ST75-7XWN> (detailing an algorithm created at the Chicago-Kent College of Law which was able to predict the outcomes of Supreme Court cases with 70% accuracy based on an analysis of 7,700 rulings between 1953 and 2013). Most helpful among these functions is likely the ability of AI to automate the legal research process. *Id.*; Black, *supra* note 30 (explaining that results based on a broad set of data analytics rather than just the terms entered will result in more uniform information); Goertzel, *supra* note 6, at 351 (discussing AI implementation in economic trading, self-driving cars, various medical applications, and a more generalized future application of the technology). Artificial intelligence has the potential to assist in police lineups and investigations, client negotiations, jury examinations, and legal research. *Id.*; Nissan, *supra* note 6, at 447 (emphasizing that by compiling vast quantities of data and analyzing them through an AI system, patterns begin to emerge that allow for some truly staggering predictive metrics).

³³ See, e.g., Donald G. McFetridge & Douglas A. Smith, *Patents, Prospects, and Economic Surplus: A Comment*, 23 J. OF L. & ECON. 197, 198 (1980) (noting that “[t]he patent confers upon its owner an exclusive right to commercialize.”).

³⁴ See *id.* (articulating how “the patent system will generate property rights along the frontier of the technology while leaving the older core free for all to use.”); see also Sichelman, *supra* note 7, at 353 (arguing that extending exclusive patent rights to inventors significantly slows commercialization).

and the benefits they provide.³⁵ In order to better understand why inventors want to patent these systems, we must further examine the primary incentives for inventors to invent.³⁶

Innovation is born out of necessity.³⁷ The idea that there is always an easier way or that there is always something that can be done better underpins the entirety of human ingenuity.³⁸ The patent system helps by incentivizing the inventors who identify and address these societal problems.³⁹ An inventor may file for a patent the moment that their invention has been reduced to practice and claim a variety of exclusionary property rights encompassed by their invention.⁴⁰ The

³⁵ See Lauri Donahue, *A Primer on Using Artificial Intelligence in the Legal Profession*, JOLT DIGEST (Jan. 3, 2018), archived at <https://perma.cc/2TUB-N6RT> (offering that the legal profession stands to benefit greatly from the introduction of AI). In fact, AI is already being used by LexisNexis and Westlaw in limited capacities and has shown promise in supplying users with answers regarding legal doctrines, definitions, burdens of proof, and claim elements. *Id.*; see also Nissan, *supra* note 6, at 441-42 (explaining how the artificial intelligence systems being implemented by these providers examine data inputs by millions of users and analyze search terms based on natural language processing rather than terms and connectors analysis). These types of searches are better suited for human-based inputs as they return a greater number of relevant search results based on what the user is actually looking for. *Id.*

³⁶ See Maya Medeiros & Jordana Sanft, *Artificial intelligence and intellectual property considerations*, FINANCIER WORLDWIDE (Jan. 2018), archived at <https://perma.cc/Q4WR-PLQK> (stating that “[g]iven the quickly evolving AI market, obtaining early priority dates is important in view of the ‘first to file’ nature of the patent system.”).

³⁷ See HENRY W. CHESBROUGH, *OPEN INNOVATION: THE NEW IMPERATIVE FOR CREATING AND PROFITING FROM TECHNOLOGY* xvii (Harv. Bus. Rev. Press 2005) (noting the need for businesses to constantly take risks, innovate, or face failure); see also Devendra Sahal, *Technological guideposts and innovation avenues*, 14 RES. POL’Y 61, 63 (1985) (arguing that innovation occurs as a result of a societal need to overcome a technologically evolving population).

³⁸ See Sahal, *supra* note 37, at 63 (explaining how human innovation is based on the understanding that there is always an easier way to accomplish the goal).

³⁹ See Sichelman *supra* note 7, at 352 (analyzing that the patent’s nature as an exclusionary property right can be used by an inventor against potential infringers or licensed out for financial gain).

⁴⁰ See CRAIG ALLEN NARD, *THE LAW OF PATENTS* 246 (4th ed. 2017) (explaining how reduction to practice is an important component of the patent application process as it measures the date at which a patent could have been filed by the inventor). Reduction to practice may be either constructive or actual. *Id.* Constructive reduction occurs on the date on which the application is filed and

patent application itself is comprised of two components: the specification and the claims.⁴¹ The specification discloses the claimed invention and informs the readers of the particulars of that invention while the claims describe the metes and bounds of the inventor's property rights.⁴² The most common incentive for patenting technology falls under the reward theory which allows the inventor to recoup research and development costs, as well as make a profit, by either selling the invention or licensing out the technology so that others may capitalize on it.⁴³ Another powerful tool in the patent holder's arsenal is the ability to bring infringement actions against parties who either directly or indirectly copy the claims of the patented invention in an attempt to make their own profit.⁴⁴

The ability to commercialize and defend one's invention and claimed property rights fits in well with the overall goal of AI.⁴⁵ These

satisfies the disclosure requirements under 35 U.S.C. § 102. *Id.* Actual reduction occurs when the inventor is able to prove that the claimed invention works for its intended purpose. *Id.*; Sichelman *supra* note 7, at 348–58 (outlining Sichelman's path of developing and marking his company's product).

⁴¹ See *Nonprovisional (Utility) Patent Application Filing Guide*, USPTO (Jan. 2014), archived at <https://perma.cc/BYH7-DKDM> (defining the material elements of obtaining a patent).

⁴² See NARD, *supra* note 40, at 86 (describing the construction of a patent claim through the creation of the specification). The claim language is especially important in patent construction as the words used are highly stylized and chosen to reflect the capabilities of the claimed invention and particularize the exclusionary rights being obtained by the inventor. *Id.*

⁴³ See *USPTO Fee Schedule*, USPTO (Jan. 1, 2019), archived at <https://perma.cc/H459-MSVX> (establishing that the cost alone for simply filing and issuing a patent can be upwards of \$3,000). Add to this figure the cost of adding additional claim language to the patent application and the possibility of either IPR, PGR, or litigation in the Federal Circuit Court and the associated costs can easily break into the tens of thousands. *Id.*; see also Rick Mullin, *Cost to Develop New Pharmaceutical Drug now Exceeds \$2.5B*, SCI. AM. (Nov. 24, 2014), archived at <https://perma.cc/H6QD-VH5V> (noting that it is not unreasonable to spend millions researching and developing a particular invention). There was a 145% increase in the cost of developing pharmaceuticals from 2003 to 2014. *Id.*

⁴⁴ See NARD, *supra* note 40, at 496-97 (explaining that direct infringement occurs when an inventor brings an action against a party that is himself engaging in practices which infringe one or more of the inventor's patented claims). Indirect infringement occurs when a party aids a direct infringer in some way, such as supplying a component of a patented invention, or providing instruction that allows direct infringement to occur. *Id.* at 521.

⁴⁵ See Goertzel, *supra* note 6, at 351 (finding that the implementation of more general AI across a variety of societal platforms requires increased development that would

AI systems are being designed to revolutionize our societal landscape and automate many of our day-to-day processes, and being able to protect the rights of those who take the time to create and develop these systems is an important concern in any inventive community.⁴⁶ There is little doubt that the patenting of AI would allow inventors to receive just compensation and protect them against competitors who would otherwise infringe upon their work.⁴⁷

II. The Federal Circuit Approach to AI Patentability

A. Subject Matter Patentability Under § 101

Under 35 U.S.C. §101, an invention is patentable if its subject matter is worthy of protection.⁴⁸ Traditionally there is a bar against patents which attempt to claim biological material, abstract mental processes, laws of nature, and certain types of software.⁴⁹ Finding exactly where AI fits in within these subject matter requirements is

benefit from the protection of software engineers and inventors to innovate without fear of financial burden).

⁴⁶ See Goertzel, *supra* note 6, at 351-52 (offering AI functions that could facilitate everyday routines); see also Michael I. Rackman, *The Patentability of Computer Programs*, 38 N.Y.U. L. REV. 891, 892-93 (1963) (noting the age-old concern of programmers that their work could be easily pirated and they would have no legal remedy to protect themselves against infringers).

⁴⁷ See Rackman, *supra* note 46, at 914 (concluding that AI patent protection would protect inventors and that AI innovators should not be denied the protections allowed to other inventors).

⁴⁸ See *Inventions patentable*, 35 U.S.C. § 101 (1952) (defining a patentable invention as “any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof”).

⁴⁹ See *Alice v. CLS Bank Int'l*, 573 U.S. 208, 225-26 (2014) (holding that “the abstract idea implemented on a generic computer” may not be patented); see also *Ass’n for Molecular Pathology et al. v. Myriad Genetics, Inc.*, 569 U.S. 576, 595 (2013) (finding that cDNA, a biological material “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”); *Mayo Collaborative Servs. v. Prometheus Laboratories*, 566 U.S. 66, 92 (2012) (stating that methods for calibrating proper thiopurine drug dosages to treat autoimmune diseases are not patentable because of how closely they are intertwined with the “underlying laws of nature”).

difficult because of its nature as a computational simulation of human thought process and application to everyday methods.⁵⁰ In order to better assess whether AI falls within the context of eligible subject matter under § 101 it is important to analyze how the Federal Circuit Court has traditionally interpreted the statute.⁵¹

One of the most recent authorities on subject matter patentability came with the Supreme Court's ruling in *Bilski v. Kappos*.⁵² In *Bilski*, the applicant sought to patent a method of instructing buyers and sellers to protect themselves against the risk of fluctuating economic prices.⁵³ This patent was challenged on the ground that its subject matter encompassed an abstract mental process that fell outside the scope of §101's subject matter.⁵⁴ In determining whether the claimed process did more than just apply mental mathematics the Court adopted the machine or transformation test to assist in their considerations.⁵⁵ This test looks at whether the claimed invention is indeed a process within the meaning of §101 if it: "(1) is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing."⁵⁶

By choosing to implement this guiding test, the Court made specific mention as to its applicability in the fields of emerging technologies.⁵⁷ When applied to the claims at issue, the Court

⁵⁰ See Francisco Gallego et al., *Boosting Human-Level AI with Videogames: Mad University*, 36 *KYBERNETES* 517, 519-27 (2007) (explaining that artificial intelligence incorporated into videogames is an excellent depiction of AI machine learning intended to mimic the thought process and actions of human players).

⁵¹ See 35 U.S.C. § 101 (defining the subject matter included within inventions that can be patentable to include "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof").

⁵² See *Bilski v. Kappos*, 561 U.S. 593, 598 (2010) (affirming the method of hedging risk in the field of commodities trading is not patentable).

⁵³ See *id.* at 598 (providing that the three arguments for the claim that the invention is outside of the scope of patent law).

⁵⁴ See *id.* (listing that the three arguments were "(1) it is not tied to a machine and does not transform an article; (2) it involves a method of conducting business; and (3) it is merely an abstract idea").

⁵⁵ See *id.* at 603 (considering this the sole test of what constitutes a "process").

⁵⁶ See *id.* at 604 (noting that the machine or transformation test is not intended to be the sole instrument through which an invented process is deemed to encompass patentable subject matter).

⁵⁷ See *id.* at 605 (explaining that unforeseen innovations such as computer programs are not necessarily unpatentable because 35 U.S.C. § 101 is a "dynamic provision designed to encompass new and unforeseen inventions" thus, a categorical rule

ultimately decided that the applicant's invention was not a patentable process due to its reliance on abstract mathematical concepts simply applied to a particular field of business.⁵⁸

In the years since *Bilski*, the courts have continued to delineate what is and is not patent eligible subject matter through three important cases: *Mayo Collaborative Services v. Prometheus Labs*⁵⁹, *Association of Molecular Pathology v. Myriad Genetics, Inc.*⁶⁰, and *Alice v. CLS Bank*.⁶¹ In *Mayo* the Court held that a process which merely recites a law of nature is not patentable unless that process has additional features that elevate it beyond a pure recitation or monopolization of the natural law.⁶² The Court further narrowed the scope of eligible subject matter in *Myriad* where it found that naturally occurring substances are not patentable without further inventive efforts.⁶³ Finally, in *Alice* the Court solidified the establishing framework of *Mayo*, looking toward whether a patent contained typically ineligible subject matter, such as a mathematical formula, and was able to transform the nature of the claim into a patent-eligible concept through the implementation of additional claim elements.⁶⁴

denying patent protection for emerging technologies would frustrate the purposes of patent law itself).

⁵⁸ See *Bilski*, 561 U.S. at 659 (holding that the machine or transformation test cannot be used exclusively to determine the patentability).

⁵⁹ See *Mayo Collaborative Servs. v. Prometheus Lab., Inc.* 566 U.S. 66, 66 (2012) (determining the patentability of methods “for calibrating proper dosage of thiopurine drugs to treat autoimmune diseases filed infringement suit.”).

⁶⁰ See *Ass’n for Molecular Pathology et al. v. Myriad Genetics, Inc.*, 569 U.S. 576, 588 (2013) (holding that “patent claims relating to cDNA met the patent eligibility requirements of § 101.”).

⁶¹ See *Alice v. CLS Bank Int’l*, 573 U.S. 208, 212 (2014) (finding that “merely requiring generic computer implementation fails to transform that abstract idea into a patent-eligible invention.”).

⁶² See *Mayo*, 566 U.S. at 77 (answering the question of “do the patent claims add enough to their statements of the correlations to allow the processes they describe to qualify as patent-eligible” in the negative).

⁶³ See *Myriad*, 569 U.S. at 589–92 (holding that a molecular diagnostic company’s contribution of uncovering the precise location and genetic sequence of particular genes still fell within the law of nature exception and thus was not entitled to a patent).

⁶⁴ See *Alice*, 573 U.S. at 217–21 (holding that merely utilizing a computer to apply a traditionally patent-ineligible concept does not make the invention subject matter eligible).

AI attempts to emulate the process of human thought at an extremely complex and rapidly advancing level.⁶⁵ AI systems are, at their core, exercises in the quantification of abstract thought.⁶⁶ For this reason, there exists a fundamental problem in the patenting of such inventions: are AI systems ineligible subject matter because they claim processes that result in an equivalent to abstract thought?⁶⁷ This is certainly a difficult question to answer and strangely enough, while there do exist patents for machine learning techniques, there have not been any patents granted for an actual artificially intelligent computer.⁶⁸

In order to properly analyze whether an AI system is patent eligible subject matter we must first determine what the claimed invention would be.⁶⁹ A patent for an AI could very well contain claim language that classifies the system as an amalgamation of complex algorithms which emulate human thought processes.⁷⁰ If this is the case, then either the PTO or a third party could challenge the patent application on the grounds that it attempts to patent abstract thought or laws of nature.⁷¹ Thus, an AI would need to pass the various tests set

⁶⁵ See Maries & Scarlat, *supra* note 19, at 601 (describing the initial artificial intelligence systems that have significantly improved since their initial emergence in 1965).

⁶⁶ See Maries & Scarlat, *supra* note 19, at 599 (defining computational intelligence); Shi & Zheng, *supra* note 16, at 810-11 (setting forth the foundation of artificial intelligence systems).

⁶⁷ See Jeremy Gillula & Daniel Nazer, *Stupid Patent of the Month: Will Patents Slow Artificial Intelligence?*, ELECTRONIC FRONTIER FOUND. (Sept. 29, 2017), archived at <https://perma.cc/VM24-RK6X> (noting that “AI patents are likely to raise many of the same problems as software patents generally”).

⁶⁸ See *id.* (warning against granting patents for machine learning techniques due to the potential hindrance on innovation and economic progress).

⁶⁹ See Inventions patentable, 35 U.S.C. § 101 (1952) (providing the categories of patent eligible subject matter). The primary concern is whether the invented AI would be claimed as a process, machine, manufacture, or composition of matter. *Id.*; NARD, *supra* note 40, at 496-97 (noting the two-part test of determining whether an application states the best mode of carrying out the invention, which is a requisite for patentability).

⁷⁰ See Specification, 35 U.S.C. § 112(a) (2011) (setting forth the requirements for a patent claim, including disclosure of the “best mode contemplated by the inventor . . . of carrying out the invention”); Shi & Zheng, *supra* note 16, at 810 (characterizing the intended performance of artificial intelligence as emulating human intelligence).

⁷¹ See 35 U.S.C. § 101 (limiting patent eligible subject matter to *new* inventions); *Alice v. CLS Bank Int’l*, 573 U.S. 208, 217-18 (2014) (implying that abstract ideas are not patentable because they already exist); *Ass’n for Molecular Pathology*, 569 U.S. 576, 577 (finding that laws of nature are exempt from patent protection because

forth in *Bilski* and its progeny in order to be considered patent eligible.⁷²

Looking first to *Bilski* and its machine or transformation test, we must determine if an AI's simulated thought process is either tied to a particular machine or apparatus, or it transforms a particular article into a different state or thing.⁷³ Knowing that an AI system derives its goal of simulated thought through the computer's implementation of various algorithms makes it fairly clear that it is a process tied to a particular machine or apparatus.⁷⁴ Looking toward *Myriad* there may be an argument here that an AI patent represents an attempt to patent a form of life.⁷⁵ While it is true that the AI inventors seek to perfectly reproduce human thought, at this point in time these systems cannot be qualified as living, and thus *Myriad* would not apply.⁷⁶ Finally, looking at *Mayo* and *Alice* we must consider whether the implementation of additional elements turn the patent ineligible concept of simulated abstract thought into a patent eligible process.⁷⁷

they are naturally occurring and thus not a new invention); *Mayo*, 566 U.S. 66, 72 (holding that a process of transforming natural laws must demonstrate a significant "inventive concept" in order to be patentable).

⁷² See *Alice*, 573 U.S. at 217-27 (stating that to be patent eligible, an invention must "do more than simple instruct the practitioner to implement the abstract idea of intermediated settlement on a generic computer"); see also *Myriad*, 569 U.S. at 589-92 (holding that patent protection must weigh incentives for innovation and the flow of information that fosters creativity); *Mayo*, 566 U.S. at 77 (finding that in order to be patent eligible a process must be more than "a drafting effort designed to monopolize the law of nature itself"); *Bilski*, 561 U.S. 593, 603 (detailing the various levels of analysis required for subject matter eligibility).

⁷³ See *Bilski*, 561 U.S. at 600-03 (describing the machine-or-transformation test, which mandates that a process be connected to a particular machine or cause an item to change states).

⁷⁴ See *Shi & Zheng*, *supra* note 16, at 810 (reinforcing the notion that AI requires a computer capable of utilizing a variety of different learning methods and algorithms in order to function properly).

⁷⁵ See *Mayo*, 566 U.S. at 76-78 (noting that *Mayo*'s patent covered not only natural phenomena, but also administering drugs and measuring the body's response to them, which transforms the human body by removing blood from it); Frederick Kile, *Artificial Intelligence and Society: a Furtive Transformation*, 28 AI & SOC. 107, 108 (2013) (speculating that machines may be capable of replacing human thought).

⁷⁶ See *Mayo*, 566 U.S. at 77 (recognizing that some patent claims do not add enough "statements of the correlations" to allow it to be eligible for natural law).

⁷⁷ See *Alice*, 573 U.S. at 217-27 (examining the elements of a process in order to determine whether it is patentable); see also *Ass'n for Molecular Pathology et al. v.*

This is difficult to determine with absolute certainty as the additional elements being performed are complex mathematical algorithms designed to simulate biological processes.⁷⁸ The courts may very well assert that the use of mathematical algorithms are extensions of natural laws and, therefore, are not sufficient to transform the process of simulated abstract thought into a patent eligible process.⁷⁹

The entirety of this subject matter analysis is dependent on how the Federal Circuit Court would choose to interpret the claims of an AI system patent.⁸⁰ There are a multitude of reasons that the court could reject the patent claims even if the subject matter is determined to be eligible for patenting.⁸¹ Despite the vast power and deference given to the patent courts, there has been a recent push to distribute some of the judicial deference to the PTO, and by extension to the Patent Trial and Appeal Board (PTAB).⁸² Should the PTO receive greater judicial deference and more substantive rulemaking authority then it may not matter what the patent courts say regarding the patentability of AI

Myriad Genetics, Inc., 569 U.S. 576, 590–96 (2013) (holding that an invention that is closely related to a natural item is only patentable if it alters the natural version of the original item).

⁷⁸ See Shi & Zheng, *supra* note 16, at 810 (explaining that AI involves thousands of complicated mechanisms, which makes it difficult to analyze with the elements test).

⁷⁹ See *Diamond v. Diehr*, 450 U.S. 175, 192 (1981) (holding that when a claim recites a mathematical formula an inquiry must be made into whether the inventor is seeking patent protection for that formula as it is applied in the abstract).

⁸⁰ See *Affinity Labs of Texas v. DirecTV*, 838 F.3d 1253, 1262–63 (Fed. Cir. 2016) (holding that a patent claiming to filter regional broadcast access is a non-patentable abstract idea). If the claimed AI system is viewed by the courts as an attempt to patent abstract thoughts then it will surely fail 35 U.S.C. § 101's subject matter eligibility. *Id.* at 1265.

⁸¹ See U.S. CONST. art. I, § 8, cl. 8. (granting Congress the power to issue patents in furtherance of promoting the useful arts and sciences, which is not fulfilled by inventions that lack novelty); Patentability of Inventions, 35 U.S.C. §§ 102–103 (2011) (requiring novelty and non-obviousness for patent eligibility); NARD, *supra* note 40, at 261, 425 (arguing that a patent may be invalidated under § 102 because it encompasses prior art or may be subject to a public use or on-sale statutory bar). Likewise, under § 103, a patent may not be granted because the claimed invention is the mere combination of prior patents or is facially obvious and not worthy of exclusionary property rights. *Id.* at 329.

⁸² See Brief for Respondent, *supra* note 9, at 26 (noting how “matters that involve the application of legal standards to facts and affect private interests are routinely decided by agency action” rather than courts) (quoting *Thomas v. Union Carbide Agric. Prods. Co.*, 473 U.S. 568, 583 (1985)).

systems.⁸³

III. The Administrative Authority of the Patent and Trademark Office

A. History of the PTO

The PTO first began its life as the Patent Office (Office) as a result of the Patent Act of 1836.⁸⁴ At the time, the Office was tasked with examining and issuing patents to inventors, as well as ensuring that patent applications adhered to the statutory boundaries of patent law.⁸⁵ If a patent was rejected then the applicant was permitted to appeal the decision to a board of examiners and afterwards any decision could be challenged through judicial review.⁸⁶ Since then the Patent Office has become the PTO and performs almost identical functions to the one it played at its inception.⁸⁷

While technology has evolved since the passing of the original Patent Act, the PTO has failed to keep up.⁸⁸ It lacks the substantive

⁸³ See Brief for Respondent, *supra* note 9, at 10 (establishing that it is entirely feasible that the PTO would take a more modernistic approach to subject matter patentability which is more in line with Congress' intent to use the patent system as a way of promoting the useful arts and sciences).

⁸⁴ See NARD, *supra* note 40, at 22-23 (contending that the 1836 Patent Act was passed in order to remedy prior Patent Acts which did not have a proper vehicle for the processing of patent applications by giving this task to the Patent Office).

⁸⁵ See Patent Act of 1836, ch. 357, 5 Stat. 117 §§ 2-4 (1836) (outlining the different positions within the Patent Office and their obligations).

⁸⁶ See *id.* §§ 5-7 (listing the requirements of the patent application process).

⁸⁷ See Patent Act of 1952, ch. 950, 66 Stat. 792 §§ 1-2 (1952) (noting the United States Patent and Trademark Office is referred to interchangeably as the Office and the Patent and Trademark Office); Burstein, *supra* note 9, at 1765-68 (detailing the history of the PTO and the statistics surrounding its administrative functions).

⁸⁸ See S. Benjamin Pleune, *Trouble with the Guidelines: On Urging the PTO to Properly Evolve with Novel Technologies*, 2001 U. ILL. J. TECH. & POL'Y 365, 366 (2001) (explaining issues that have arisen as the PTO attempts to keep up with rapidly emerging technology in the fields of biotechnology and genetics); *USPTO Patent Statistics Chart Calendar Years 1963-2015*, USPTO (Feb. 19, 2019), archived at <https://perma.cc/2P9E-R2Y2> (reporting that approximately 315,015 patents were filed in 2000 compared to the 629,647 patents recorded in 2015). The

rulemaking authority granted to most other government agencies under the Administrative Procedures Act (APA)⁸⁹ and as a result is beholden to the whims of the Federal Circuit Court.⁹⁰ To properly understand how a shift in this dynamic might occur within the PTO we must first examine how the agency promulgates its rules.

B. PTO Rule Promulgation

The PTO has established a wide array of procedural rules since its creation and the passing of the APA.⁹¹ However, these rules are designed to govern interactions between the PTO and the patent applicant rather than deal strictly with statutory interpretation.⁹² Following the Supreme Court's landmark decision in *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*,⁹³ agencies were given

number of patent applications going through the PTO has more than doubled since 2000 while the time it takes for a patent to issue remains stagnant. *Id.*; see also *USPTO Issue of Patent*, USPTO (Feb. 19, 2019), archived at <https://perma.cc/Q9KC-SPU6> (noting that the issuance of a patent can take at least six weeks); Burstein, *supra* note 9, at 1766-68 (discussing how the vast increase in patents filed has changed the role of administrators and increased patent litigation).

⁸⁹ See Administrative practice; general provisions, 5 U.S.C. § 500 (2012) (governing the ways in which federal and state agencies function and enact various rules and regulations). The APA agencies may promulgate rules and conduct administrative hearings that affect how they operate. *Id.*; Rule making, 5 U.S.C. § 553 § (b)-(e) (2012) (providing guidelines for the process of agency rulemaking); Adjudications, 5 U.S.C. § 554 (a) (2012) (setting forth the adjudication procedures of administrative hearings); *About Us*, USPTO (Jan. 30, 2019), archived at <https://perma.cc/G3KA-Q9MT> (stating that the PTO is a federal agency); see also Identification of patent, patent application, or patent-related proceeding, 37 C.F.R. § 1.5 (a)-(d) (2015) (pointing out that the PTO promulgates: (1) various rules regarding who may apply for patents, (2) the fees set by the agency, (3) how records are kept and introduced to the public, (4) what is actually required in a valid patent application, and more). The PTO is a federal agency, and thus its rulemaking and agency actions must comport with the regulatory language set forth in the APA.

⁹⁰ See Mack, *supra* note 9, at 2128 (noting that while the PTO has broad powers to establish rules, the Court of Appeals for the Federal Circuit has placed significant limitations on this authority).

⁹¹ See 37 C.F.R. § 1.5 (a)-(d) (listing procedural rules in correspondence, specifically signature rules); see also Mack, *supra* note 9, at 2118-19 (noting the changes in format, structure, and readability of PTO rules).

⁹² See 37 C.F.R. § 1.5 (a)-(d) (2015) (establishing how correspondence between the PTO and the patent applicants is subject to specific requirements in order for the PTO to accept any communication).

⁹³ *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council*, 467 U.S. 837, 865 (1984).

considerable deference in how they choose to interpret their guiding statutes.⁹⁴ Despite this ruling the PTO has failed to assert substantive judicial authority both because of its status as a sub-agency within the Department of Commerce, and Congress' presumed intent to leave statutory interpretation to the Federal Circuit Court.⁹⁵

Under *Chevron* the courts must give considerable weight to the statutory interpretations set forth by Congress.⁹⁶ However, if the statute does not speak to, or is ambiguous with respect to the specific issue, the court must determine whether the agency's interpretation is based on a permissible construction of the statute.⁹⁷ So long as the agency reasonably interprets the statute or acts accordingly with its role as intended by Congress, the agency's decision is controlling.⁹⁸ The question then becomes whether the PTO is entitled to *Chevron* deference as an agency.⁹⁹

Chevron deference is heavily dependent upon the expertise and function of an agency.¹⁰⁰ It has been argued that the current framework

⁹⁴ See *id.* at 861-62 (discerning that the language in the statute and the terms are not dispositive, and therefore the language of the statute was not intended to be confined); Andrew H. Baida, *Agency Deference and Expertise*, 39 MD. B. J. 20, 21 (2006) (discussing how agency deference is the level of presumptive authority given to a particular agency's adjudicative decisions by the courts and is often commensurate with the degree of expertise demonstrated by the agency with regards to a particular area of interest).

⁹⁵ See R. Carl Moy, *Judicial Deference to the PTO's Interpretations of the Patent Law*, 74 J. PAT. & TRADEMARK OFF. SOC'Y 406, 414-16 (1992) (explaining the necessary steps to increase the authority and influence of the PTO).

⁹⁶ See *Chevron*, 467 U.S. at 842-43 (stating that if Congressional intent is clear within the confines how a particular law is to be carried out, then the court, as well as the agency, must act in compliance with this intent).

⁹⁷ See *id.* (detailing how the judiciary responds when a relevant statute is silent or ambiguous on a specific issue).

⁹⁸ See *id.* at 845 (noting that when an agency makes a reasonable interpretation and acts in accordance with Congress' intent in creating the agency, the agency's decision is controlling).

⁹⁹ See *id.* at 863-64 (finding that the Environmental Protection Agency (EPA) is entitled define "source," even if its definition is flexible); see also Moy *supra* note 95, at 414 (predicting that giving the PTO *Chevron* deference would "work a fundamental and wide-ranging change in the relationship of that agency to the Federal Circuit.").

¹⁰⁰ See Moy, *supra* note 95, at 420-21 (explaining that *Chevron* deference is typically given to agencies which are unitary in structure and demonstrate particular expertise in their regulatory field).

and regulatory oversight of the PTO does not demonstrate the agencies expertise within the realm of patent adjudication, and thus should not receive *Chevron* deference.¹⁰¹ Among these criticisms is the fact that the PTO has historically not performed any adjudicatory functions and possesses no enforcement or true rulemaking abilities.¹⁰² Despite the historically hands-off functionality of the PTO, the introduction of the America Invents Act (AIA) in 2011 made substantial alterations to the role of the PTO placing it more in line with the agency expertise required under *Chevron*.¹⁰³

The AIA established two primary vehicles for agency oversight in the form of Post Grant Review (PGR) and Inter Partes Review (IPR).¹⁰⁴ PGR is a trial-like proceeding conducted by the PTAB to review the patentability of a claim, or claims, when challenged by a third party.¹⁰⁵ Similarly, IPR is a trial-like proceeding, initiated by a third party wishing to challenge the validity of another's patent, before the PTAB to review patentability of claims for novelty or

¹⁰¹ See Moy, *supra* note 95, at 426 (stating: “Unfortunately for the PTO’s claim of expertise, the PTO performs none of the three traditional agency functions within this statutory scheme.”).

¹⁰² See Moy, *supra* note 95, at 426–27 (pointing out that patent adjudication occurs before the courts as a civil action brought by an injured plaintiff and noting that the PTO has no power to bring patent infringement actions against parties on its own accord). This view of the PTO is no doubt the product of the agency’s status as primarily procedural rather than substantive. *Id.* at 427. Many perceive the PTO’s authority to establish regulations as delegation that is wholly inconsistent with a congressional intent to permit substantive, binding rules of authority. *Id.*

¹⁰³ See Leahy-Smith America Invents Act, H.R. 1249, 112th Cong. §§ 1-2 (2011) (establishing when the Leahy-Smith America Invents Act was codified); see also Brent Owen, *US Congress Considers Law that Would Overturn Chevron Deference*, FRESH L. BLOG (Aug. 11, 2016), archived at <https://perma.cc/9DNM-SHND> (noting that currently there is concern in the field of administrative law as Congress considers introducing a law that would effectively overturn *Chevron*). The case highlighted that on July 12, 2016, the House of Representatives passed a bill called the “Separation of Powers Restoration Act of 2016.” *Id.* Further, this law seeks to amend the APA and require that all agency-related matters appearing before the court be treated *de novo* rather than adhering to the agency’s interpretation under *Chevron*. *Id.* If this bill be signed into law, this section of the Comment will likely be deemed wholly inapplicable to the expansion of the PTO’s substantive authority. *Id.*

¹⁰⁴ See *America Invents Act Changes Brochure*, FINNEGAN, HENDERSON, FARABOW, GARRETT, & DUNNER, LLP (Jan. 31, 2019), archived at <https://perma.cc/G7FL-R99A> (showing the differences between IPR and PGR as compared to ex parte proceedings).

¹⁰⁵ See *Post Grant Review*, USPTO (Dec. 28, 2018), archived at <https://perma.cc/JMR3-GTD8> (defining what a Post Grant Review is).

obviousness.¹⁰⁶ Both proceedings aim to provide the PTO with more adjudicatory function, the presence of which would seem to indicate that the PTO would be entitled to *Chevron* deference.¹⁰⁷

This new adjudicatory power given to the PTO has come under attack recently in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*,¹⁰⁸ which was heard by the Supreme Court on November 17, 2017. The outcome of *Oil States* will have a large impact on whether the PTO will receive more substantive rulemaking authority and thus its overview is essential for determining future evaluations of the patentability of AI.¹⁰⁹

C. Oil States v. Greene's Energy: The Potential for Expanded Administrative Deference

The petitioner, Oil States, owns a patent that claims various apparatuses and methods of protecting wellhead equipment from conditions experienced during hydraulic fracking.¹¹⁰ In 2012, Oil States filed an infringement suit against Greene's Energy who then petitioned the PTO for an IPR of the Oil States patent.¹¹¹ Greene's Energy claimed that the Oil State patent was rendered not novel under § 102 by prior art, the collective body of preexisting information related to a particular invention, found in Canada predating the Oil State patent.¹¹²

¹⁰⁶ See *Inter Partes Review*, USPTO (Dec. 28, 2018), archived at <https://perma.cc/FM29-T6TZ> (defining Inter Partes Review).

¹⁰⁷ See Moy, *supra* note 95, at 420 (noting the expertise required by agencies under the AIA in order to receive *Chevron* deference).

¹⁰⁸ See *Oil State Energy Serv. v. Greene Energy Grp.*, 138 S. Ct. 1365, 1372 (2018) (describing how the petitioners assert that IPR is an unconstitutional adjudicatory hearing which allows a historically regulatory administrative agency make determinations that are inconsistent with the decisions of the Federal Circuit Court).

¹⁰⁹ See *id.* at 1379 (inferring that without juries, the PTO will have full authority to establish substantive rules).

¹¹⁰ See *id.* at 1372 (articulating that Oil States has a patent regarding the process of hydraulic fracking).

¹¹¹ See *id.* (showing that Greene's Energy "challeng[ed] the patent's validity" in response to Oil States' initial cause of action).

¹¹² See *id.* (highlighting the argument presented by Greene's Energy that "two of the patent's claims were non-patentable because they were anticipated by prior art not mentioned by Oil States in its original patent application.").

After Greene's Energy's petition for IPR was granted, the PTAB reexamined the patentability of the claims asserted by the Oil States patent and invalidated them.¹¹³ In response to the PTAB's decision, Oil States attempted an appeal to the Court of Appeals for the Federal Circuit which only served to affirm the decision reached during the IPR.¹¹⁴ Oil States then petitioned the Supreme Court for a hearing on the matter, arguing that IPR is unconstitutional under Article III of the Constitution.¹¹⁵

Oil States purports that IPRs wrest adjudicatory control away from the courts as prescribed by Article III.¹¹⁶ Because the IPRs are so functionally similar to the roles historically performed by the Federal Circuit Court, Oil States argues that they upend the sanctity of Article III which established the courts as the *de facto* judicial vehicles in the country.¹¹⁷ Furthermore, IPRs rule on patent novelty and obviousness, which has been interpreted by the federal courts since the inception of the patent system.¹¹⁸ In totality Oil States' argument against IPRs boils down to its dissatisfaction with the recent shift in regulatory authority given to the PTO through the AIA.¹¹⁹

Conversely, Greene's Energy argues that the Constitution's establishment of regulatory patent power to Congress under Article I, § 8 allows the PTO to utilize the adjudicatory functions of IPRs.¹²⁰

¹¹³ See *Oil State Energy Serv.*, 138 S. Ct. at 1372 (elaborating how the Board acknowledged the District Court's contrary decision but still concluded the claims were non-patentable).

¹¹⁴ See *id.* at 1370 (explaining the procedural history of the Greene's Energy claim).

¹¹⁵ See Brief for Petitioner at 6, *Oil State Energy Serv. v. Greene Energy Grp.* (2018) (No. 16-712) (arguing that IPR allows Congress to remove cases from the federal court when it does not agree with its judgments).

¹¹⁶ See *id.* at 20 (stressing that under the IPR if patent holders lose their patent then they are not able to assert claims they could have raised in the IPR).

¹¹⁷ See *id.* at 5-6 (noting that IPRs allow petitioners to practice motions before the PTAB, request discovery, depose and cross-examine witnesses, settle their case at any time during the IPR trial proceedings, receive final, binding judgments by the PTAB "judges", and appeal decisions made during the IPR).

¹¹⁸ See *Oil State Energy Serv.*, 138 S.Ct. at 1370 (characterizing the requirements for patentability to include utility, novelty, nonobviousness based on the prior art).

¹¹⁹ See Brief for Petitioner, *supra* note 115, at 13-14 (noting that the PTO has always had the power to reexamine the patents that it grants in instances of error).

¹²⁰ See U.S. CONST. art. I, § 8, cl. 8 (declaring Article 1 § 8 "promote[s] 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"); see also Brief for Respondent, *supra* note 9, at 7 (summarizing how "Congress has created by statute the patent right, and defined the nature, scope and limits of that right.").

Greene's Energy cites the rich history of the PTO's statutory authority as proof that the agency was always intended to regulate the prescription and scope of exclusive patent rights.¹²¹ Additionally, IPR is characterized as an administrative post-issuance error-correction mechanism permitted by the APA because of the PTO's general expertise in the area of patents.¹²² Greene's Energy's argument hinges upon the fact that the PTO has statutory authority to regulate the issuance of patents and that IPR is a natural extension of its right to provide oversight to the patent monopolies which the agency grants.¹²³

Ultimately, the Court held that IPR does not infringe upon Article III because patents represent a public right between the government and others.¹²⁴ In formulating this opinion the Court relied on the history of patent law and the traditional functions of the PTO and the Federal Court respectively.¹²⁵ The Court made it clear that the AIA allows the PTO to reexamine the patents it grants outside of the Federal Circuit, but also narrowly construed its holding to the functionality of IPRs.¹²⁶ The ultimate decision of the Supreme Court

¹²¹ See Brief for Respondent, *supra* note 9, at 14 (citing *Crown Die & Tool Co. v. Nye Tool & Machine Works*, 261 U.S. 24, 40 (1923)) (referencing how U.S. patent rights derive explicitly from statutes); see also *Gaylor v. Wilder*, 51 U.S. 477, 494 (1850) (indicating that an inventor solely acquires his property right in his invention via statute); *Wheaton v. Peters*, 33 U.S. 591, 592 (1834) (recognizing that an author's property rights in his works can only be asserted under the Copyright statute).

¹²² See Brief for Respondent, *supra* note 9, at 18 (describing IPR as an extension of the PTO's innate patent issuance authority and noting additional post-issuance corrective mechanisms utilized by the agency).

¹²³ See Brief for Respondent, *supra* note 9, at 25-26 (contending that the Petitioner ignores the PTAB's ability to proceed by "issu[ing] a final written decision even after the parties seek termination").

¹²⁴ See *Oil State Energy Serv.*, 138 U.S. at 1373 (recognizing the long-held precedent that granting patents is a matter of public rights).

¹²⁵ See *id.* at 1377 (citing to the historical patent review schemes under both the English Privy Council in the 18th century as well as American patent law upheld under the old Patent Act of 1870 as being inapplicable under the AIA legislative scheme).

¹²⁶ See *id.* at 1370-71 (summarizing that reexamination process of proposed patents "would follow the general procedures for initial examination"). The reexamination process would also "allow the third-party and the patent owner to" file responses and relies; limiting the manner in which they participate. *Id.* However, the Court specifically chose to not apply its holding to PGR and TPCBM. *Id.* at 1379; see generally *America Invents Act Changes Brochure*, *supra* note 104 (asserting it likely

hinged on the public rights doctrine and the PTO's authority to interact with the public rights it grants, this decision, while limited, has the potential to expand the administrative authority of the PTO.¹²⁷ Since the Court held that IPR is within the administrative ability of the agency, we could see the utilization of *Chevron* deference in future proceedings.¹²⁸ By solidifying the PTO's power as an adjudicative entity, even if that adjudicative strength is limited in scope, the PTO will have a firm foot in the door of judicial expertise based on the statutory rules it follows.¹²⁹ Feasibly, this status would grant the PTO *Chevron* deference and therefore an expansion of substantial judicial rulemaking authority.¹³⁰

that PGR and TPCBM could be next on the chopping block as both are adjudicatory venues that take on responsibilities typically left to the Federal Circuit); *see also* Moy, *supra* note 95, at 428 (providing that the elimination of these review mechanisms would thereby relegate the functionality of the PTO back to its traditional status as a purely issuing agency with severely limited review powers).

¹²⁷ *See Oil State Energy Serv.*, 138 U.S. at 1373 (reestablishing how the public rights doctrine arises upon the interaction between the government and the public); Moy, *supra* note 95, at 435-36 (providing the Court's decision to uphold the PTAB's authority to conduct IPR will almost certainly make the PTO a more formidable agency when it comes to the level of expertise it can demonstrate through its issuing of patents). The agency is thereby afforded greater substantive administrative deference. *Id.* at 436. However, if the Court's holding is only narrowly applied in future litigation, as it seems it would be, any potential future that the PTO might have for expanded administrative authority would be substantially hindered. *Id.* at 429-31. *Cf. Mack, supra* note 9, at 2105-06 (outlining the interpretation of patents for emerging technologies, left entirely up to the Federal Circuit, will struggle to keep up with the speed of technological innovation; partially affected by the backlog of patents).

¹²⁸ *See Moy, supra* note 95, at 419 (discussing the applicability of *Chevron* deference to PTO and its impact on Federal Circuit decision-making and rationale); *see also* Baida, *supra* note 94, at 23 (explaining that agencies which can purport to be experts in areas pertinent to litigation are afforded significant deference by the courts). They are presumed to be the best equipped to carry out their duties as charged by Congress. *Id.*

¹²⁹ *See Moy, supra* note 95, at 431-32 (analyzing the scope of the PTO and its overall statutory scheme of patent law).

¹³⁰ *See United States v. Mead Corp.*, 533 U.S. 218, 237 (2001) (holding that *Chevron* deference should be afforded when it is clear that the subject matter is within the official responsibilities of that agency).

IV. Where to go after *Oil States*

A. Future Cases use the *Oil States* Holding to Expand the PTO's Substantive Authority

The potential of the Court to endorse the appellate actions of the PTO may very well shift the issue of AI patentability from the Federal Court to the arena of the PTO.¹³¹ If this were the case, then the analysis described above in *Bilski* and its progeny may be wholly inapplicable, albeit guiding, to the question of AI subject matter eligibility.¹³² The question would then turn on the interpretive might of the PTO as well as prior guiding principles set forth by the common law of patents.¹³³

If the PTO is afforded greater administrative authority by the Court's impending decision in *Oil States*, the question of AI patentability will undoubtedly shift to the agency.¹³⁴ While many of the guiding legal principles discussed above will remain applicable to this issue, we may see a greater breadth of granted patents based upon theoretically invalidated subject matter, and AI could certainly fall within this category.¹³⁵

¹³¹ See Moy, *supra* note 95, at 414-15 (suggesting PTO's potential to reshape a wide variety of both agency and patent law).

¹³² See *Chevron, U.S.A., v. Nat. Res. Def. Council*, 467 U.S. 837, 842-43 (1984) (establishing that agency deference is only afforded by the court when Congress has not directly spoken on the issue or the statute is silent or ambiguous about the issue in question); see also Moy, *supra* note 95, at 427-28 (noting how the courts afford PTO *Chevron* deference and it could potentially become the primary vehicle for determinations of subject matter eligibility).

¹³³ See Moy, *supra* note 95, at 431 (signaling that the PTO's interpretive strength is dependent on the legal subject matter).

¹³⁴ See Moy, *supra* note 95, at 414-15 (indicating that greater authoritative deference to the PTO would likely lead to its prominence in wholly regulating large areas of patent law).

¹³⁵ See *Alice v. CLS Bank Int'l*, 573 U.S. 208, 217-18 (2014) (positioning that if AI, in an attempt to patent abstract ideas, was rejected by the courts, another two-step analysis is available for determining whether something is "patent-eligible"). First, the court must establish whether the elements "'transform the nature of the claim' into a patent-eligible application." *Id.* Second, the court must determine if the elements of the claim include an "'inventive concept' . . . that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.*

In the wake of the Court's decision upholding the validity of IPR, it may be in the best interest of the PTO to try and promulgate new rules regarding its appellate proceedings which would allow dissatisfied patentees to bring a review of their applications within the confines of the PTAB.¹³⁶ By creating an arena for first parties to challenge the decisions of patent examiners, the PTO could not only further develop its expertise in the field (an essential component of *Chevron* deference), but could also establish itself as a primary decision-making agency.¹³⁷ This shift in authoritative power could transform the PTO into a substantive agency capable of handling preliminary patent application matters without the aid of the Federal Circuit.¹³⁸ This marked shift would then allow the courts to be tasked solely with the enforcement of an inventor's patent rights while keeping questions of patentability within the purview of the PTO.¹³⁹

B. The Court Severely Limits the Application of the Oil States Holding

Even if the Supreme Court declines to extend its holding beyond its applicability to IPRs, the PTO should still receive expanded authoritative deference because of the statutory language of 35 U.S.C.¹⁴⁰ The ability to issue and regulate patents is a power

¹³⁶ See *Oil State Energy Services v. Greene's Energy Group*, 138 S. Ct. 1365, 1379 (2018) (holding that Inter Partes Review is constitutional).

¹³⁷ See *Organization, Mission and Functions Manual: United States Parole Commission*, DOJ (Sept. 9, 2014), archived at <https://perma.cc/YV5P-MR3B> (stating that the Department of Justice similarly utilizes the U.S. Parole Commission to make primary considerations regarding an offender's risk to the community and eligibility for parole).

¹³⁸ See *id.* (referring to the major functions of the USPC, which includes "prescrib[ing], modify[ing], and monitor complanc[ing] with the terms and conditions governing offenders' behavior while on parole or mandatory or supervised release," "[i]ssue warrants for violation of supervision," and [d]etermine probable cause for revocation process").

¹³⁹ See *Moy*, *supra* note 95, at 429 (explaining "The factual determinations of a typical agency are overturned only if they are unsupported by substantial evidence – a showing that is more deferential to the agency than the standards applied to the PTO.").

¹⁴⁰ See Establishment, 35 U.S.C. § 1(a) (highlighting the functions of the PTO as "shall retain responsibility for decisions regarding the management and administration if its operations and shall exercise independent control of its budget allocations and expenditures, personnel decisions and processes, procurements, and other administrative and management functions").

specifically given to the PTO by Congress.¹⁴¹ Furthermore, 35 U.S.C. establishes the PTAB as a congressionally endorsed regulatory arm of the PTO that is intended to be used by those dissatisfied with the issuing decisions of patent examiners.¹⁴² In fact, review by the Federal Circuit Court is only specifically mentioned in conjunction with appealing final agency actions regarding patent grants, and settling patent infringement disputes.¹⁴³

The statutory language found throughout 35 U.S.C. seems to make it clear that it was Congress' intent with the formation of the PTO that the agency be tasked with determining subject matter patentability as it directly influences the granting of a patent application.¹⁴⁴ The only reason the Federal Circuit seems to make determinations of subject matter patentability is because it is often used as a defense to an infringement suit.¹⁴⁵ Thus, in the wake of

¹⁴¹ See Powers and duties, 35 U.S.C. § 2(2)(C) (2012) (stating that the PTO is also responsible for facilitating and expediting the patent application process and may promulgate various agency rules through the notice-and-comment rulemaking process). Notice-and-comment rulemaking is the process by which certain agencies may promulgate new regulatory rules. *Id.*; see also Rulemaking, 5 U.S.C. § 553 (b)—(e) (1966) (declaring during this process the agency must publish any proposed rules in the Federal Register so that interested parties may be given ample opportunity to interact with the proposed rules through a series of proposed submissions and alterations); Scope of review, 5 U.S.C. § 706 (2) (expressing that the PTO is permitted to promulgate rules through this process and does so in many instances to lay the foundational framework required for the patent process).

¹⁴² See Patent Trial and Appeal Board, 35 U.S.C. §§ 6 (a) (2012); Appeal to Court of Appeals for Federal Circuit, 35 U.S.C. § 141 (c)—(d) (1952) (promoting Inter Partes Reviews and post grant reviews as useful appellate methods in the event of an adverse agency decision).

¹⁴³ See 35 U.S.C. § 141 (a) (providing that the Federal Circuit serves as a means for applicants who are “dissatisfied with the final decision of the Patent Trial and Appeal Board in a proceeding may appeal [there]”).

¹⁴⁴ See Examination of application, 35 U.S.C. § 131 (2012) (asserting that the “Director shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor.”).

¹⁴⁵ See Clarence G. Galston, *The Patent in Court—Infringement*, 33 J. PAT. OFF. SOC'Y 633, 640 (1951) (noting that the question of infringement undoubtedly turns on claim validity). One of the easiest ways to avoid infringing on an individual's patent is to say that the patent is invalid and never should have been issued. *Id.* Because the issue of infringement and validity are so intertwined it becomes difficult,

limited IPR validity, the PTO would need to bare its teeth in a unique and authoritative way.¹⁴⁶ Considering the statutory formation of the PTO, it follows that the agency should be the vehicle through which patent validity is determined while the Federal Circuit should be left to handle infringement suits brought by patent holders.¹⁴⁷

In order to give the PTO greater administrative authority, the agency should develop a system of patent adjudication that is unique to the question of patent validity.¹⁴⁸ If the PTO were to design a mechanism similar to IPRs or PGRs that allowed third parties to challenge patent validity within the confines of the agency *before* an infringement action, then the agency could expand its congressionally enumerated authority while still allowing the Federal Circuit to behave as an impartial adjudicatory arena for patent infringement cases.¹⁴⁹ This bifurcated approach to patent litigation could feasibly be accomplished through the passing of a specific statute similar to the AIA, or by amending the functionality of IPRs (assuming that only IPRs are held to be constitutionally valid) through notice-and-

if not impossible, to keep the courts away from the question of subject matter patentability. *Id.*

¹⁴⁶ See Relation to other proceedings or actions, 35 U.S.C. § 315(a)(1) (2012) (highlighting the fact that IPR only applies when the petitioner or a real party in interest to the suit challenges the validity of the claim).

¹⁴⁷ See Moy, *supra* note 95, at 429 (pointing out the Federal Circuit tends to treat patent validity *de novo* as a separate component to most patent infringement actions, this interaction is significantly different from the majority of agency actions that are reviewed by the courts).

¹⁴⁸ Compare America Invents Act Changes Brochure, *supra* note 104 (examining how “[t]he AIA replaces Inter Partes reexamination with a more trial-like Inter Partes Review (IPR) proceeding, adds a new post-grant review (PGR) proceeding that provides even broader grounds for invalidity, and leaves *ex parte* reexamination essentially unchanged.”) with PTO Consolidated Patent Rules, 37 C.F.R. §§ 41--42, 90 (2017) (examining how the AIA introduced substantive changes to the PTO’s functionality through IPRs, PGRs, and TCPBMs, it would not be that much of a stretch to envision a piece of future legislation that either expands, or creates, new PTO authority aimed at adjudicating the patentability requirements set forth in the consolidated rules).

¹⁴⁹ See FINNEGAN ET AL., *supra* note 104 (noting that there would likely be considerable resistance to such a significant change given the extensive involvement of the courts throughout patent law’s history); see also Moy, *supra* note 95, at 434 (addressing the power of the courts with regard to patentability determinations and how it may be risky given the relative inexperience of the PTO in these matters). *But see* Burstein, *supra* note 9, at 1804 (advocating for reduced interference by the courts rather than a complete abrogation of their functionality).

comment rulemaking.¹⁵⁰

Such a mechanism, especially if it is independently created, would likely be trial-like proceedings, structured similarly to PGRs, and be overseen by administrative patent judges.¹⁵¹ These trials would allow third parties to challenge the grant of a patent solely on the basis of subject-matter validity (35 U.S.C. § 101) and could only be brought within a reasonable time after the PTO first granted the patent.¹⁵² The cost of litigating a validity trial would likely be similar to the existing costs associated with IPRs and PGRs (approximately \$15,000)¹⁵³ and would follow the trial and practice rules associated with these existing mechanisms.¹⁵⁴ Further, these proceedings would not violate Article III of the Constitution because they would be designed to adjudicate matters which are very squarely within the statutory authority of the PTO.¹⁵⁵

C. AI's Place in the PTO's Administrative Future

AI is a stepping stone in emerging technologies that inventors

¹⁵⁰ See FINNEGAN ET AL., *supra* note 104 (discussing the risks and benefits under the AIA, if a third party has a pending patent application, and that third is able to file a preissuance submission at the USPTO).

¹⁵¹ See Patent Trial and Appeal Board, 35 U.S.C. § 6 (a) (describing the general structure of the Patent Trial and Appeal Board); *Post Grant Review*, *supra* note 105 (explaining how the post grant review is a trial proceeding that reviews the patentability of one or more claims in a patent).

¹⁵² See *cf.* *Post Grant Review*, *supra* note 105 (explaining that the nine month window for bringing claims under PGR seems to be an appropriate window for a validity challenge against a particular patent).

¹⁵³ See *USPTO Fee Schedule*, *supra* note 43 (indicating that Inter Partes Review request fees and Inter Partes Review post-institution fee is \$15,500).

¹⁵⁴ See 37 C.F.R. §§ 41, 42, 90 (discussing the patent fees and who the payment of patent fees shall be made to).

¹⁵⁵ See *cf.* Brief for Petitioner, *supra* note 115, at 10-11 (asserting that supporters of Oil States would certainly find problems in this scheme parallel to those identified with IPRs). Allowing the PTAB to make substantive determinations as to the validity of the patents it grants seemingly steps on the same toes of those who would argue that the PTO's use of these appellate vehicles violates Article III and removes control from the courts. *Id.* at 14, 22-25. However, a validity proceeding would differ substantially from the current reach of IPR (which deals only with challenges to 35 U.S.C. §§ 102, 103) in that patentability is an initial determination to be made solely by the PTO rather than by the courts. See 35 U.S.C. § 2 (a)(1).

will likely seek to patent in the near future.¹⁵⁶ As such its patentability is inexorably strung up in the PTO's authority to issue patents.¹⁵⁷ As discussed above, the eligibility of AI presents certain issues as the technology may be viewed as an attempt to patent abstract thought.¹⁵⁸ However, this may not be as significant of a problem if the PTO is permitted to exercise its authority as it has traditionally done.¹⁵⁹ The PTO tends to take a broad view of patentability as it is discussed in 35 U.S.C. whereas the Federal Circuit looks through a substantially narrower lens.¹⁶⁰ It stands to reason then that if the patent examiners at the PTO, as well as the agency itself, are permitted to issue patents based on a broader interpretation of 35 U.S.C. § 101, and this determination is given near-absolute authority, that AI and other fast-approaching technologies will likely be deemed patentable.¹⁶¹

Even if the PTO still neglects to consider AI as a program to be patentable, inventors may find success by tethering the AI software to a specific machine and then patenting that bundled invention.¹⁶²

¹⁵⁶ See J.H. Abawajy, *supra* note 6, at 68 (discussing the increasing proliferation of AI technology within society and various inventions that inventors will undoubtedly seek to protect).

¹⁵⁷ See Inventions patentable, 35 U.S.C. § 101 (1952) (providing the criteria for when an inventor can obtain a patent).

¹⁵⁸ See Stamatis, *infra* Part II (elaborating on the obstacles to obtaining patents for AI technology).

¹⁵⁹ See 35 U.S.C. § 101 (highlighting that the statute allows for someone to obtain a patent if they invent or discover something); see also *Alice v. CLS Bank Int'l*, 573 U.S. 208, 212 (2014) (recognizing the PTO did not issue a patent for the abstract concept of generic computer implementation); *Ass'n for Molecular Pathology et al. v. Myriad Genetics, Inc.*, 569 U.S. 576, 595–96 (2013) (noting that because the processes used by Myriad were so “understood, widely used, and fairly uniform insofar,” that a process patent could not be obtained); *Mayo Collaborative Servs. v. Prometheus Laboratories*, 566 U.S. 66, 86-92 (2012) (inferring that because giving a patent to “discoveries of new diagnostic laws of nature” would impede research and innovating).

¹⁶⁰ See *Myriad*, 569 U.S. at 586 (articulating that the Federal Circuit, on remand, held that “both isolated DNA and cDNA were patent eligible,” and the Supreme Court reversed).

¹⁶¹ See *McFetridge & Smith*, *supra* note 33, at 198 (describing that a patent allows the owner to commercialize it and receive commercial gains). *But see* *Gilulla & Nazer*, *supra* note 67 (referencing companies such as Google and Microsoft that have very broad patents which may actually impede the progress of such inventions and breakthroughs in the field).

¹⁶² See *Bilski v. Kappos*, 561 U.S. 593, 603 (2010) (noting the machine or transformation test and the increased likelihood of patentability being found when one ties a historically non-patentable concept to a functional apparatus).

Alternatively, AI inventors may seek to obtain a copyright for the code which makes up their AI rather than obtain a patent for the invention itself.¹⁶³ Either of these avenues would feasibly allow AI inventors to adequately protect their works in a landscape where the PTO is given more substantial authority yet still unwilling to extend such protections to AI.¹⁶⁴

Conclusion

The future is fast approaching, and as technology races forward patent law has historically struggled to adapt.¹⁶⁵ Within the next few years society will come face to face with AI systems that aim to be more integrated into our lives than we could ever have thought possible.¹⁶⁶ As a result, the law must dictate whether these systems should be deemed patentable by their inventors.¹⁶⁷ The current struggle for substantive authority between the Federal Circuit Court and the Patent and Trademark Office provides the backdrop for this and many other questions which will continue to mount as innovation

¹⁶³ See CRAIG JOYCE ET AL., COPYRIGHT LAW 3 (6th ed. 2016) (paraphrasing that copyright law protects original works of authorship and provides an exclusive right to use, and authorizes the use of, copyrighted works in various ways). Under the applicable copyright laws, computer programs and their code is eligible for copyright protection. *Id.*; see also Subject matter of copyright: In general, 17 U.S.C. § 102(a)(1) (2012) (showing that “works of authorship” protected by copyright law includes literary works like computer programs); *Apple Comput. v. Franklin Comput.*, 714 F.2d 1240, 1252-53 (3d Cir. 1983) [hereinafter *Apple*] (holding that computer code is a copyrightable as a literary work, when looking at the legislative history of the statute).

¹⁶⁴ See *Bilski*, 561 U.S. at 605 (noting that prior cases have held that a procedure included in a program is within patentable subject matter); *Apple*, 714 F.2d at 1252-53 (holding that copyright law protects the means of expressing an idea including processes and methods).

¹⁶⁵ See Pleune, *supra* note 88, at 366 (proffering that the rise in attempting to patent DNA in animals and humans is causing problems with how it should be addressed via the PTO and the Patent Act).

¹⁶⁶ See Goertzel, *supra* note 6, at 351 (exuding that financial trading, surveillance, and self-driving cars may have AI implementation in the future).

¹⁶⁷ See Moy, *supra* note 95, at 426 (explaining that the current statutory scheme of the American patent system bestows a monopoly-like right on inventors on the basis that doing so will speed the pace of innovation in exchange for disclosure of the invention).

outpaces itself exponentially.¹⁶⁸

Should the *Oil States* holding wind up flexing the muscles of the PTO we may very well see the future of patentable inventions dictated by the administrative agency rather than by the courts.¹⁶⁹ While this outcome would greatly consolidate the rulemaking powers chosen to interpret patent law, it aims to eliminate the significant judicial deference associated with the field.¹⁷⁰

Even if IPRs validity is construed narrowly in the future, it is entirely possible that within the next decade that the promulgation of additional rules or amending of IPRs entirely could lead to a bifurcated patent system where the PTO and Federal Circuit work closely with each other on related, but separate, patent issues.¹⁷¹ The PTO would absorb the statutory regulation of patented inventions found in 35 U.S.C. §§ 101–103 into its responsibilities and leave the enforcement of a patentee's property rights to the litigation-focused arena of the Federal Circuit Court.¹⁷²

AI stands to benefit greatly from an authoritative PTO with a broader scope toward subject matter patentability.¹⁷³ The technology stands to act as a litmus test for testing both the boundaries of the PTO and the Federal Circuit regardless of the administrative outcome that takes hold in the near future.

¹⁶⁸ See Moy, *supra* note 95, at 426 (highlighting that the PTO does not “have any enforcement role under the present statutory scheme.”).

¹⁶⁹ See *Oil State Energy Serv. v. Greene Energy Grp.*, 138 S. Ct. 1365, 1368 (2018) (paraphrasing that IPRs would permit the PTO to continue exercising specialized expertise in granting patents which would presumably facilitate its expansion of authority).

¹⁷⁰ See Brief for Respondent, *supra* note 9, at 26 (discussing the prevalence of judicial deference associated with the field of patent law).

¹⁷¹ See Moy, *supra* note 95, at 434 (speculating about the potential implications of new patent rules and the amendment of IPRs).

¹⁷² See Moy, *supra* note 95, at 434 (offering possible new dividing lines of responsibility between the PTO and an unspecified Federal Circuit Court).

¹⁷³ See *Inventions patentable*, 35 U.S.C. § 101 (1952) (specifying which items are items are patentable); *Alice v. CLS Bank Int'l*, 573 U.S. 208, 212 (2014) (discussing the possibility of changing patent eligibility); *Ass'n for Molecular Pathology et al. v. Myriad Genetics, Inc.*, 569 U.S. 576, 595 (2013) (exploring different ways that the plaintiff could have applied for a patent for its invention that could have been successful); *Mayo Collaborative Servs. v. Prometheus Laboratories*, 566 U.S. 66, 91 (2012) (citing amicus briefs that advocate for a larger range of patentable biological innovations).