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PREVENTING PREEMPTION: PROMISE OF THE
NONOBVIOUSNESS REQUIREMENT

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Preemption is a foundational concern of the patent system. Preemption occurs when a patent improperly claims a fundamental scientific or technological concept, often called a law of nature, natural phenomenon, or abstract idea. In doing so, the patent preempts future innovation because the law, phenomenon, or idea is removed from the public domain. As a result, the public – including competitors and future innovators – no longer can use the claimed fundamental law, phenomenon, or idea. Courts’ concerns about preemption persist today. To this end, both the Supreme Court and the Federal Circuit cite preemption when issuing decisions invalidating certain patent claims or, in some instances, invalidating a patent entirely. Courts, including the Supreme Court and the Federal Circuit, commonly turn to the patentable subject matter requirement, the written description requirement, and, recently, the enablement requirement to address concerns of preemption. As a result of their reliance on these three requirements, the courts have expanded the requirements and strained the underlying doctrines. Rather than continue to rely on the currently unstable patentable subject matter doctrine, written description doctrine, and enablement doctrine, courts should turn to the nonobviousness requirement to address concerns of preemption. It has always been possible for courts to address preemption under the nonobviousness requirement because laws of nature, natural phenomena, and abstract ideas can fall into the prior art to a patent. After the Supreme Court’s decisions in John Deere and KSR, the nonobviousness requirement is an even more effective approach to addressing preemption. In John Deere and KSR, the Supreme Court expanded the scope of the prior art to a patent which in turn increased the amount of laws, phenomena, and ideas

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which fall into the prior art. Additionally, the Supreme Court created added flexibility and stability in the nonobviousness doctrine which allows courts to address preemption under the patentable subject matter requirement without straining the doctrine.

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INTRODUCTION

The health of the patent system relies on the proper regulation of patent scope. This is because innovation is best incentivized when patent scope is correctly tailored to the invention protected by the patent. One way in which overly broad patents may harm innovation is through preemption. Preemption is the “[inhibition

of] future discovery by improperly tying up the use of laws of nature and the like.”¹ Courts, including the Supreme Court and the Federal Circuit, are concerned that patent law does not preempt future innovation. Both the Supreme Court and the Federal Circuit have cited preemption as a convincing reason to narrow patent scope.² There are multiple provisions of patent law that courts can use to narrow overly broad patent scope.

This note argues that courts should address preemption by invalidating patent claims under the nonobviousness requirement. Section II explains the importance of properly tailored patent scope and describes how overly broad patents can preempt innovation. Section III provides an overview of how courts have addressed preemption under each of the patentable subject matter requirement, the written description requirement, and the enablement requirement and explains the shortcomings of each approach. Section IV provides a brief overview of how courts could address preemption under each of the novelty requirement, claim construction analysis, and the reverse doctrine of equivalents and again explains the shortcomings of each approach. Section V argues that courts should address preemption under the nonobviousness requirement and Section VI explains the doctrinal and practical benefits of doing so.

¹ *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 86 (2012).

² *See e.g.*, *Diamond v. Diehr*, 450 U.S. 175, 187 (1981) (“Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.”); *Bilski v. Kappos*, 561 U.S. 593, 611–12 (2010) (“The concept of hedging. . . is an unpatentable abstract idea, just like the algorithms at issue in *Benson* and *Flook*. Allowing petitioners to patent risk hedging would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.”); *Mayo*, 566 U.S. at 72 (“Our conclusion rests upon an examination of the particular claims before us in light of the Court’s precedents. They warn us against upholding patents that claim processes that too broadly pre-empt the use of a natural law.”); *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (“We have described the concern that drives this exclusionary principle as one of pre-emption.”); *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1052 (Fed. Cir. 2016) (“[W]hile pre-emption is not the test for determining patent-eligibility [citation omitted] it is certainly the concern that undergirds §101 jurisprudence) (quotation omitted); *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 915 F.3d 743, 752 (Fed. Cir. 2019) (“Preemption is sufficient to render a claim ineligible under §101, but it is not necessary.”).

I

PREEMPTION UNDERMINES THE PATENT SYSTEM

The efficacy of the patent system depends on patent scope being correctly tailored to the protected invention. This is because properly tailored patent scope optimally incentivizes innovation.³ Patent scope can be modulated by changing the length or the breadth of a patent.⁴ Patent length is determined by patent term which defines the period of time over which inventors can enjoy patent rights. Patent breadth defines the subject matter over which inventors enjoy patent rights.

It is unlikely that the statutorily defined term for patents will change from its present length of twenty years from filing because patent term is set by statute.⁵ However, economists dispute the optimal length of the patent term.⁶ Some economists argue that the present patent term of twenty years from filing is too long because there is little effect on welfare from extending patent terms beyond ten years.⁷ Others argue that the current patent term is inadequate to incentivize innovation of products that take longer to develop, such as certain pharmaceuticals.⁸ Still other economists argue the current regime of a uniform

³ See *infra* Part II, Sections A and B.

⁴ Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 868 (1990) (“The analysis has concentrated on how changing patent coverage affects the balance between incentives to the inventor and underuse of the invention due to patent monopolies. Thus, Nordhaus’s analysis of optimum patent life is concerned with the tradeoff between increased inventive effort resulting from longer anticipated patent life and greater deadweight costs associated with longer monopoly. Kaplow uses these two variables to analyze the effects of allowing the patent holder greater freedom regarding licensing agreements. Gilbert and Shapiro’s recent work on optimal patent length and breadth builds on the tradeoff model, as does Klemperer’s.”).

⁵ 35 U.S.C. §154 (2006) (“Subject to the payment of fees under this title, such grant shall be for a term beginning on the date on which the patent issues and ending 20 years from the date on which the application for the patent was filed in the United States or, if the application contains a specific reference to an earlier filed application or applications under section 120, 121, 365(c), or 386(c), from the date on which the earliest such application was filed.”).

⁶ Neel U. Sukhatme & Judd Cramer, *Who Cares about Patents: Cross-Industry Differences in the Marginal Value of Patent Term*, 21 AM. L. & ECON. REV. 1, 1 (2019).

⁷ William D. Nordhaus, *The Optimum Life of a Patent: Reply*, 62 AM. ECON. REV. 428, 428 (1972).

⁸ See Benjamin N. Roin, *The Case for Tailoring Patent Awards Based on Time-to-Market*, 61 UCLA L. REV. 672 (2014).

patent term across industries should be replaced by a flexible, industry-specific patent term system.⁹

Patent breadth, however, is an important and more readily manipulable lever for optimizing patent protection. Patent breadth or patent scope is constrained by the scope of the valid claims of the patent.¹⁰ Patent claims are set forth at the end of a patent specification and define the metes and bounds of the patented invention. In other words, the patent claims define the patented invention and provide notice to others of what the patent covers.¹¹ Properly tailoring patent scope is important for promoting innovation and one way in which overly broad patent claims can harm innovation is by preempting future invention.

A. *Properly Tailored Patent Breadth Optimally Incentivizes Innovation*

Determining the scope of each patent is an important judicial function. This determination is not only important to resolving cases but also allows courts to individually tailor patent scope on a patent-by-patent basis and to make decisions that help ensure that innovation is optimally incentivized across the patent system.

There is widespread agreement among scholars and judges that the rationale for the patent system is a utilitarian one.¹² The language of the constitution

⁹ Eric B. Budish, Benjamin N. Roin & Heidi Williams, *Do Fixed Patent Terms Distort Innovation? Evidence from Cancer Clinical Trials* (THE UNIV. OF CHI. BOOTH SCH. OF BUS., WORKING PAPER No. 097, 2013).

¹⁰ 35 U.S.C. §100 (2015) (“The term ‘claimed invention’ means the subject matter defined by a claim in a patent or an application for a patent.”); *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004) (“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.”); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (“First, we look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention.”).

¹¹ 35 U.S.C. §112 (2012) (“The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.”).

¹² William D. Nordhaus, *An Economic Theory of Technological Change*, 59 AM. ECON. REV. 18, 19 (1969) (“Any invention is potentially a public good in the sense that it is indivisible, or that it can in theory be used universally at zero marginal cost . . . In the model we assume that the inventor has exclusive rights to use and/or license the invention for T years, after which the invention enters the public domain as public knowledge. T can be interpreted as the life of a patent, the average lead-time, or the length for which secrets can be held The most important point is that from an economic point of view the inventor has a monopoly over the invention for T years . . . It should be stressed that the monopoly over information is essential for a sensible treatment of invention when invention is a public good.”); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. OF L. & ECON. 265, 266 (1977) (“The patent is a reward that enables

supports patents' utilitarian underpinnings, and the Supreme Court reinforces this utilitarian rationale.¹³ Under the utilitarian view, the patent system remedies market breakdown due to failures of appropriability. Under this argument, absent a patent system, inventors cannot appropriate for themselves the value they create by their innovations. This is because, after an invention becomes public, competitors can copy the invention without incurring the research and development costs incurred by the original inventor. As a result, competitors can produce and offer for sale the invention at lower prices. If the inventor wishes to remain competitive in the market, the inventor must match the lower prices offered by competitors. Thus, the original inventor is potentially unable to recoup the costs of invention, or, at the very least suffers reduced profits. As a result, inventors are not sufficiently incentivized to invent.¹⁴ At a market level, this breakdown results in suboptimal levels of invention.¹⁵ The patent system remedies the failure of appropriability

the inventor to capture the returns from his investment in the invention, returns that would otherwise (absent secrecy) be subject to appropriation by others. The existence of the reward tends to make the amount of private investment in invention closer to the value of its social product.”).

¹³ U.S. CONST. art. I, §8, cl. 8 (“The Congress shall have 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.”); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (quoting *Universal Oil Co. v. Globe Co.*, 322 U.S. 471, 484 (1944)) (“The patent laws promote this progress by offering a right of exclusion for a limited period as an incentive to inventors to risk the often enormous costs in terms of time, research, and development. The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens. In return for the right of exclusion—this ‘reward for inventions[.]’”); *Scott Paper Co. v. Marcalus Mfg. Co.*, 326 U.S. 249, 255 (1945) (“By the patent laws Congress has given to the inventor opportunity to secure the material rewards for his invention for a limited time, on condition that he make full disclosure for the benefit of the public of the manner of making and using the invention, and that upon the expiration of the patent the public be left free to use the invention. As has been many times pointed out, the means adopted by Congress of promoting the progress of science and the arts is the limited grant of the patent monopoly in return for the full disclosure of the patented invention and its dedication to the public on the expiration of the patent.”).

¹⁴ Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 (1994) (“The patent law achieves this laudable end by creating property rights in inventions.”).

¹⁵ Yafit Lev-Aretz & Katherine J. Strandburg, *Regulation and Innovation: Approaching Market Failure from Both Sides*, 38 YALE J. ON REGUL. BULL. 1, 3 (2020) (“Markets sometimes fail to supply products and services at competitive prices - or to undertake innovative activities - even when suppliers can perfectly perceive consumer demand for them. These failures, which we term ‘failures of appropriability,’ are due to either free-rider problems or barriers to entry, which have been the focus of innovation policy and intellectual property doctrine.”); Dam, *supra* note 14, at 247–48 (“To start with, it is important to recognize the primary problem that the patent system solves. This problem - often called the ‘appropriability problem’ - is that, if a firm could not recover the costs of invention because the resulting information were available to all, then we could expect a much lower and indeed suboptimal level of innovation. In short, the patent system prevents

by enabling inventors to appropriate the value of their innovation. Patents provide inventors the exclusive right to make, use, offer for sale, and sell their inventions for a limited period of time.¹⁶ During that time, inventors can exclude competitors from the market for their invention and charge monopoly prices. This allows inventors to recoup the costs of invention and profit from their innovation.¹⁷ As a result, inventors are sufficiently incentivized to invent.

The patent system also creates societal costs. When patent scope is overly broad, inventors are overcompensated for their inventions, and consumers and competitors are unnecessarily disincentivized from innovating. Precisely because patentees can exclude competitors from the markets for their inventions and charge monopoly prices, consumers pay higher prices and suffer the risk of suppressed competition and long-term invention. This is because patents disincentivize future inventors from creating useful innovations for fear of infringing the patents. In other words, future inventors suffer increased risks and costs of innovation under the patent system.¹⁸ At a market level, the unnecessary disincentivizing of competitors and future innovators results in suboptimal levels of innovation.

others from reaping where they have not sown and thereby promotes research and development (R & D) investment in innovation.”).

¹⁶ 35 U.S.C. §271 (2010) (“Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.”).

¹⁷ Lev-Aretz & Strandburg, *supra* note 15, at 12–13 (“Intellectual property law responds to the free-rider problem by awarding exclusive rights to innovators, allowing them to charge supra-competitive prices during the term of intellectual property protection. By charging supra-competitive prices, innovators can recoup their upfront investments. Moreover, since they can expect intellectual property protection, they will no longer be deterred from innovation that responds to consumer demand. If all goes well, intellectual property protection will level out the appropriability landscape.”).

¹⁸ Merges & Nelson, *supra* note 4, at 868 (“In most analyses of the different aspects of the patent system, concern has centered on a simple tradeoff. The analysis has concentrated on how changing patent coverage affects the balance between incentives to the inventor and underuse of the invention due to patent monopolies.”); Lev-Aretz & Strandburg *supra* note 15, at 13 (“However, intellectual property exclusivity can create two sorts of social costs. First, it can overcompensate (or undercompensate) innovators if the length and breadth of the exclusive rights are not tailored to the innovator’s upfront investment. Second, exclusivity is a socially costly way to ‘reimburse’ innovators, because it restricts the innovative activities of follow-on innovators in a way that a simple repayment would not.”).

B. Overly Broad Patents Can Preempt Future Innovation

One way in which overly broad patents can harm the patent system is by preempting future innovation. A patent preempts future innovation when it inhibits future discovery by “improperly tying up the use of [laws of nature, natural phenomena, and abstract ideas].”¹⁹ In other words, a patent may preempt innovation by granting an exclusive right to use these laws, phenomena, or ideas. As a result, other inventors cannot use those laws, phenomena, or ideas, and this lack of access stifles innovation.

The Supreme Court most famously expressed concerns about preemption in *O’Reilly v. Morse*.²⁰ The patent in *O’Reilly* was for a telegraph machine but claimed the exclusive right to every invention in which the motive power is electric or galvanic current and the result is the marking or printing of intelligible characters, signs, or letters at any distance. The claims were not confined to the machinery or parts of machinery specified in the patent application. Instead, the patent claimed the use of electric current, however developed, “for making or printing intelligible characters, signs or letters at any distances.” The Court found that the patent “shut[] the door against inventions [by others]” and allowed the patentee to exclusively “avail himself of new discoveries in the properties and powers of [electromagnetism]” not yet discovered. The Court decided that the patent claim was “too broad, and not warranted by law.”²¹

The policy concerns expressed by the Supreme Court in *O’Reilly* remain today as courts continue to worry about preemption. Both the Supreme Court and the Federal Circuit have issued decisions discussing the problem of preemption and invalidating patent claims to narrow patent breadth and prevent preemption.²²

¹⁹ *Mayo*, 566 U.S. at 85.

²⁰ *O’Reilly v. Morse*, 56 U.S. 62, 113 (1853) (“If this claim can be maintained, it matters not by what process or machinery the result is accomplished. For aught that we now know some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff’s specification. His invention may be less complicated—less liable to get out of order—less expensive in construction, and in its operation. But yet if it is covered by this patent the inventor could not use it, nor the public have the benefit of it without the permission of this patentee.”).

²¹ *Id.* at 112-13.

²² See cases cited, *supra* note 2.

II

WEAKNESSES OF CURRENT APPROACHES TO ADDRESSING PREEMPTION

Courts most often address preemption by invalidating overly broad patent claims under (1) the patentable subject matter requirement, (2) the written description requirement, and (3) the enablement requirement. The Supreme Court tends to address preemption by invalidating claims under the patentable subject matter requirement, whereas the Federal Circuit addresses preemption by invalidating patent claims under all three requirements. Following Supreme Court and Federal Circuit precedent, district courts also address concerns of preemption by invalidating patent claims under the patentable subject matter requirement, the written description requirement, and the enablement requirement. However, each of these approaches raises significant concerns that prevent the requirements from being effective methods of addressing preemption.

A. *The Patentable Subject Matter Requirement*

The patentable subject matter requirement²³ is a useful tool for courts to address preemption by invalidating overly broad patent claims that claim laws of nature, natural phenomena, or abstract ideas. Courts have historically, and generally continue to, address preemption under the patentable subject matter requirement. However, the patentable subject matter doctrine has been expanded too broadly, and this expansion creates multiple problems when the patentable subject matter requirement is used to address preemption.

Under the patentable subject matter requirement, “[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”²⁴ An explicit rationale for the patentable subject matter requirement is to address preemption.²⁵ Courts recognize that patenting such inventions would create a

²³ 35 U.S.C. §101 (1952) (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”).

²⁴ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”).

²⁵ See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1353 (Fed. Cir. 2010) (“That research hypotheses do not qualify for patent protection possibly results in some loss of incentive, although Ariad

preemption problem wherein monopolization of those tools through the grant of a patent would “tend to impede innovation more than it would tend to promote it.”²⁶

However, the Supreme Court has also recognized that “too broad an interpretation of this exclusionary principle [preemption] could eviscerate patent law [because] all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.”²⁷ To this end, in *Diamond v. Diehr*, the Supreme Court pointed out that an invention is “not unpatentable simply because it contains a law of nature or a mathematical algorithm,” and “an application of a law of nature or mathematical formula to a known structure or process may [] be deserving of patent protection.”²⁸ Still, the Supreme Court made clear that “to transform an unpatentable law of nature into a patent-eligible application of such a law, a patent must do more than simply state the law of nature while adding the words ‘apply it.’”²⁹ In *Alice v. CLS Bank*, the Supreme Court set forth a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from patents that claim patent-eligible applications of those concepts. This framework has come to be called the *Alice/Mayo* two-step test. At step one of the test, the court determines whether the claims at issue are directed to patent-ineligible concepts. Then, at step two of the test, each element of each claim is considered both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application. Step two of this analysis has also been described as a search for an “inventive concept,” or an element or combination of elements, that is “sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.”³⁰

presents no evidence of any discernible impact on the pace of innovation or the number of patents obtained by universities. But claims to research plans also impose costs on downstream research, discouraging later invention. The goal is to get the right balance, and the written description doctrine does so by giving the incentive to actual invention and not ‘attempt[s] to preempt the future before it has arrived.’”)

²⁶ *Mayo*, 566 U.S. at 71 (“Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work. [citation omitted]. . . And monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it.”) (quotation omitted).

²⁷ *Mayo*, 566 U.S. at 71.

²⁸ *Diehr*, 450 U.S. at 187.

²⁹ *Mayo*, 566 U.S. at 71–72.

³⁰ *Alice*, 573 U.S. at 217–18.

The patentable subject matter requirement is an effective tool for addressing preemption. The Supreme Court has addressed preemption by invalidating patent claims under the patentable subject matter requirement in a few notable decisions. In *Bilski v. Kappos*, the Supreme Court invalidated patent claims, finding that the concept of hedging was an unpatentable abstract idea. The Court also found that “[a]llowing [the patentee] to patent risk hedging would [preempt] use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.”³¹ Following the same line of logic, in *Alice v. CLS Bank*, the Supreme Court made clear that the principle of preemption is the basis for the judicial exceptions to patentability.³² However, in *Diamond v. Diehr*, the Supreme Court found that the patent at issue did not claim patentable subject matter because the patentees did not seek to patent a mathematical formula.³³ Instead, they sought patent protection for a process of curing synthetic rubber. The court found that the patented process “admittedly employ[ed] a well-known mathematical equation, but [the patentees did] not seek to pre-empt the use of that equation.” “Rather, [the patent only] foreclose[d] from others the use of that equation in conjunction with all of the other steps in [the] claimed process.”³⁴

In *Ariosa v. Sequenom*, the Federal Circuit followed the Supreme Court’s precedent and found that questions of preemption are inherent in, and resolved by, patentable subject matter analysis.³⁵ The court also found that a concern of the patentable subject matter requirement is that patent law “not inhibit further discovery by improperly tying up the future use of these building blocks of human ingenuity.”³⁶ In other words, patents “should not prevent the use of the basic building blocks of technology—abstract ideas, naturally occurring phenomena, and natural laws.”³⁷

Despite the focus of the patentable subject matter doctrine on addressing preemption, addressing preemption by invalidating patents under the patentable

³¹ *Bilski*, 561 U.S. at 611–12 (2010).

³² *Alice Corp.*, 573 U.S. at 216 (“We have described the concern that drives this exclusionary principle as one of pre-emption.”).

³³ *Diehr*, 450 U.S. at 187.

³⁴ *Id.*

³⁵ See *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015).

³⁶ *Id.* at 1379 (quoting *Alice*, 134 S. Ct at 2354).

³⁷ *Id.* at 1379.

subject matter requirement poses some problems. First, invalidating patent claims under the patentable subject matter requirement tends to disrupt whole areas of innovation rather than address patent validity on a claim-by-claim or a patent-by-patent basis. For example, courts have frequently relied on the patentable subject matter requirement to address issues of preemption in the diagnostics space and cases including *Mayo v. Prometheus Labs*, *Ariosa v. Sequenom*, and *Athena v. Mayo*, make it difficult to imagine how a court or the U.S. Patent and Trademark Office could now find any diagnostic patentable, without straining the doctrine.³⁸

Second, the patentable subject matter requirement has been confusingly applied to invalidate patent claims to physical objects, despite the doctrine's stated focus on laws of nature, natural phenomena, or abstract ideas. In *In re TLI Communications*, the Federal Circuit found "not every claim that recites concrete, tangible components escapes the reach of the abstract-idea inquiry."³⁹ This reading strains the doctrine because courts invalidate, under the patentable subject matter requirement, claims directed to physical objects as not transforming laws of nature, natural phenomena, or abstract ideas into something more, despite the physical structure described by the claim. For example, in *American Axle*, the Federal Circuit invalidated, under the patentable subject matter requirement, a claim which included a physical structure. The claim at issue was directed to "a method of manufacturing a driveline propshaft containing a liner designed such that its frequencies attenuate two modes of vibration simultaneously."⁴⁰ Additionally, the claim described multiple physical components, including a first driveline component, a second driveline component, a hollow shaft member, and

³⁸ *Mayo*, 566 U.S. at 74-75 (invalidating patent claims to a method of optimizing therapeutic efficacy for treatment of an immune-mediated gastrointestinal disorder including administering the drug and determining the level of 6-thioguanine in the subject wherein the level of 6-thioguanine indicates whether the drug should be increased or decreased); *Sequenom*, 788 F.3d at 1373-74 (invalidating patent claims to a method for detecting a paternally inherited nucleic acid of fetal origin performed on a maternal serum or plasma sample from a pregnant female including amplifying a paternally inherited nucleic acid from the serum or plasma sample and detecting the presence of a paternally inherited nucleic acid of fetal origin in the sample); *Athena*, 915 F.3d at 747 (invalidating patent claims directed to a method for diagnosing neurotransmission or developmental disorders related to muscle-specific tyrosine kinase in a mammal comprising the step of detecting in a bodily fluid of said mammal autoantibodies to an epitope of muscle-specific tyrosine kinase).

³⁹ *In re TLI Commc'ns LLC Pat. Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016).

⁴⁰ *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 967 F.3d 1285, 1293 (Fed. Cir. 2020), *cert. denied*, 142 S. Ct. 2902 (2022).

a liner which is a tuned resistive absorber and a tuned reactive absorber.⁴¹ Yet, the Federal Circuit found that the claim was directed to a patent-ineligible law of nature because the claimed method was an application of Hooke's law, and the patent did not provide any physical structure or steps for achieving the claimed result.⁴² Thus, the court found no "inventive concept" in the claim to transform it into patent eligible subject matter.⁴³ However, the claim at issue contained a specific, concrete solution of inserting a liner inside a propshaft to address a particular problem of vibrations in propshafts. Additionally, the claim did not recite any particular natural law but did recite specific physical limitations. Because every mechanical invention "must apply the laws of physics[.]" the Federal Circuit's expanded application of the patentable subject matter requirement threatens to overrun *Diehr* and find ineligibility of patent claims simply because they inherently contain a law of nature or a mathematical algorithm.⁴⁴ Thus, the Court's decision in *American Axle* creates confusion and expands the patentable subject matter doctrine profoundly because even a patent claim which recites a physical structure may be unpatentable as a law of nature, natural phenomenon, or abstract idea.⁴⁵

Third, perhaps because of the tension in the doctrine created by the first two issues, the patentable subject matter doctrine continues to change, and the doctrine is likely to undergo congressional reform.⁴⁶ This change and looming reform makes the doctrine less stable and therefore makes the patentable subject matter requirement a less effective long-term approach to addressing issues of preemption.

B. *The Written Description Requirement*

Courts also continue to address preemption under the written description requirement,⁴⁷ as they historically have, by invalidating patent claims which are

⁴¹ *Id.* at 1290.

⁴² *Id.* at 1285.

⁴³ *Id.* at 1299.

⁴⁴ *Id.* at 1319 (Fed. Cir. 2020) (Moore, J., dissenting).

⁴⁵ *Id.* at 1305 (Fed. Cir. 2020) (Moore, J., dissenting).

⁴⁶ Thom Tillis, *Sens. Tillis and Coons and Reps. Collins, Johnson, and Stivers Release Draft Bill Text to Reform Section 101 of the Patent Act* (May 22, 2019), <https://www.tillis.senate.gov/2019/5/sens-tillis-and-coons-and-reps-collins-johnson-and-stivers-release-draft-bill-text-to-reform-section-101-of-the-patent-act>.

⁴⁷ 35 U.S.C. §112 (2012) ("The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any

overly broad and not adequately described by the patent specification. However, addressing preemption by invalidating claims under the written description requirement also poses problems.

Under the written description requirement, a patent specification must clearly allow a person of ordinary skill in the art to recognize that the inventor has actually invented what is claimed. “An [inventor] complies with the written description requirement by describing the invention, with all its claimed limitations.”⁴⁸ In other words, under the written description requirement, the scope of the right to exclude is limited by the disclosure of the patent.

Courts frequently use the written description requirement to address concerns of preemption. In *Fiers v. Revel*, the Federal Circuit found that “[c]laiming all DNA’s that achieve a result without defining what means will do so is not in compliance with the description requirement; it is an attempt to preempt the future before it has arrived.”⁴⁹ The Federal Circuit reinforced this view, using much the same language in *Billups-Rothenberg v. Associated Regional and University Pathologists*, finding that the written description requirement “exists to ensure that inventors do not ‘attempt to preempt the future before it has arrived.’”⁵⁰ The Federal Circuit again restated this view and provided additional context in *Ariad v. Eli Lilly*. In *Ariad*, the Court found that “research hypotheses do not qualify for patent protection[,]” and while this exclusion “possibly results in some loss of

person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.”).

⁴⁸ *Gentry Gallery, Inc. v. Berklene Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (“To fulfill the written description requirement, the patent specification must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed An applicant complies with the written description requirement by describing *the invention*, with all its claimed limitations It is a truism that a claim need not be limited to a preferred embodiment. However, in a given case, the scope of the right to exclude may be limited by a narrow disclosure.”); *Univ. Of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 922–23 (Fed. Cir. 2004) (“While it is true that this court and its predecessor have repeatedly held that claimed subject matter need not be described in haec verba in the specification to satisfy the written description requirement . . . it is also true that the requirement must still be met in some way so as to describe the claimed invention so that one skilled in the art can recognize what is claimed.”).

⁴⁹ *Fiers v. Revel*, 984 F.2d 1164, 1171 (Fed. Cir. 1993) (Finding the patentee’s priority application failed to provide an adequate written description because the enabling disclosure of the specification was not commensurate in scope with the claim under consideration).

⁵⁰ *Billups-Rothenberg, Inc. v. Associated Reg’l & Univ. Pathologists, Inc.*, 642 F.3d 1031, 1036 (Fed. Cir. 2011).

incentive[.]” “[c]laims to research plans also impose costs on downstream research, discouraging later invention.”⁵¹ The Court stated, more broadly, that the written description doctrine achieves the right balance by incentivizing “actual invention and not ‘attempt[s] to preempt the future before it has arrived.’” Further, the Court explained that “the purpose of the written description requirement is to ‘ensure that the scope of the right to exclude, as set forth in the claims, does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.’”⁵² The Court stated that the written description requirement “is part of the *quid pro quo* of the patent grant and ensures that the public receives a meaningful disclosure in exchange for being excluded from practicing an invention for a period of time.”⁵³

Multiple issues arise when courts use the written description requirement to address concerns of preemption, because the purpose of the written description requirement is not to address preemption, but rather to provide protection for the *quid pro quo* of the patent system. To this end, a patent confers on the inventor “the exclusive right to use the means [the inventor] specifies to produce the result or effect [the inventor] describes, and nothing more.”⁵⁴ While protecting the *quid pro quo* of the patent system is not necessarily in conflict with preventing preemption, the two goals are nevertheless not always aligned. This misalignment of purpose and current function has resulted in changing, expanding, and confusing doctrine. For example, the Federal Circuit appears to stretch coverage of the written description requirement in both *Gentry Gallery* and *Eli Lilly* to position the doctrine as an alternate approach to the patentable subject matter requirement for addressing preemption.

In *Gentry Gallery*, the Federal Circuit began to expand the written description requirement.⁵⁵ The court found that the description of the recliner patent did not support the claims at issue in which the location of the recliner controls was “other than on the console[.]” because the original disclosure clearly identified the console as the “only possible location for the controls.”⁵⁶ The court found that the patent

⁵¹ *Ariad Pharms.*, 598 F.3d at 1353.

⁵² *Id.*

⁵³ *Id.* at 1353-54.

⁵⁴ *O’Reilly*, 56 U.S. at 119.

⁵⁵ See *Gentry Gallery*, 134 F.3d.

⁵⁶ *Id.*

description provided for “only the most minor variation in the location of the controls,” and the court noted that the controls “may be mounted on top or side surfaces of the console rather than on the front wall . . . without departing from this invention.”⁵⁷ The decision in *Gentry Gallery* was a turn away from prior written description requirement decisions because the court allowed much less freedom to the patentee to claim embodiments not specifically disclosed by the specification.⁵⁸

The Federal Circuit went a step further in heightening the written description requirement in *Regents of the University of California v. Eli Lilly*. In *Eli Lilly*, the court found that regardless of whether the patent provided an enabling disclosure, it did not provide an adequate written description for the subject matter of the claim at issue.⁵⁹ The claim at issue was directed to a recombinant microorganism that included human insulin-encoding cDNA.⁶⁰ The patent described “a method of obtaining this cDNA by means of a constructive example.” However, the court found that the example provided only a “general method for obtaining the human cDNA. . . along with the amino acid sequences of human insulin A and B chains.”⁶¹ Further, the court found that “[d]escribing a method of preparing a cDNA or even describing the protein that the cDNA encodes, as the example does, does not necessarily describe the cDNA itself.”⁶² As a result, the court found that the specification did not provide an adequate written description of the invention.⁶³ In *Eli Lilly*, the court turned further away from pre-*Gentry Gallery* written description doctrine by finding that a constructive example, which both described and offered a method of preparing a necessary component of an invention, did not adequately describe that invention, despite enabling it.

⁵⁷ *Gentry Gallery*, 134 F.3d at 1479.

⁵⁸ *Cf. In re Vickers*, 141 F.2d 522, 525 (C.C.P.A. 1944) (“As a general rule an applicant in a mechanical case seldom shows more than one embodiment. He is generally allowed claims, when the art permits, which cover more than the specific embodiment shown. That practice is so general that it occurs in almost every case.”); *In re Rasmussen*, 650 F.2d 1212, 1214 (C.C.P.A. 1981) (“Broadening a claim does not add new matter to the disclosure. Disclosure is that which is taught, not that which is claimed. An applicant is entitled to claims as broad as the prior art and his disclosure will allow.”).

⁵⁹ *See Eli Lilly*, 119 F.3d. at 1567.

⁶⁰ *Id.* at 1562-63.

⁶¹ *Id.* at 1567.

⁶² *Id.*

⁶³ *Id.*

The first problem created by the recent expansion of the written description doctrine is that its new breadth puts the written description requirement at odds with the policy of the doctrine of equivalents. The doctrine of equivalents promotes the policy that the scope of a patented invention should not be limited to its literal terms but should instead embrace all equivalents to the invention.⁶⁴ This is because “[t]he language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty.”⁶⁵ The Supreme Court’s decision in *Festo Corp.* supports the proposition that claim scope should not be limited to the language of the claims themselves. In *Festo Corp.*, the Supreme Court overruled the Federal Circuit’s decision to apply “a complete bar to the application of the doctrine of equivalents when an amendment has narrowed the scope of a claim for a reason related to patentability.”⁶⁶ The Federal Circuit found that the strict bar was necessary, otherwise the doctrine of equivalents would create excessive uncertainty and burden legitimate innovation.⁶⁷ However, the Supreme Court maintained the application of the doctrine of equivalents under a flexible approach. The Supreme Court further found that, though prosecution history estoppel can bar a patentee from challenging “a wide range of alleged equivalents” made or distributed by competitors, that bar’s reach requires “an examination of the subject matter surrendered by the narrowing amendment” and “[t]he complete bar avoids this inquiry by establishing a *per se* rule.”⁶⁸ By amending the application,

⁶⁴ *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731-32 (2002) (“The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty. If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. For this reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources but is not necessarily the most efficient rule. The scope of a patent is not limited to its literal terms but instead embraces all equivalents to the claims described.”).

⁶⁵ *Id.*

⁶⁶ *Id.* at 724-25; *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 574-75 (Fed. Cir. 2000), *vacated*, 535 U.S. 722. (“Today, we revisit the question we first addressed in *Hughes I* and come to a different conclusion as to the proper scope of equivalents that is available when prosecution history estoppel applies than we did in that case. We hold that prosecution history estoppel acts as a complete bar to the application of the doctrine of equivalents when an amendment has narrowed the scope of a claim for a reason related to patentability. Our decision to reject the flexible bar approach adopted in *Hughes I* comes after nearly twenty years of experience in performing our role as the sole court of appeals for patent matters.”).

⁶⁷ *Festo Corp.*, 234 F.3d at 575.

⁶⁸ *Festo Corp.*, 535 U.S. at 737-38.

the Supreme Court explained, the inventor is deemed to concede only that “the patent does not extend as far as the original claim.” Therefore, the Supreme Court found, it does not follow that the amended claim “becomes so perfect in its description that no one could devise an equivalent.”⁶⁹ The Supreme Court does leave open how equivalents should be identified.⁷⁰ However, the Supreme Court recognizes that the doctrine of equivalents should be applied narrowly.⁷¹ The doctrine of equivalents still supports the policy that “If patents were always interpreted by their literal terms, their value would be greatly diminished.”⁷² “Insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying.”⁷³ Thus, the policy of the doctrine of equivalents is in conflict with the expanded written description requirement because the written description doctrine is trending towards limiting patent claims to the embodiments specifically described in the patent. The dueling conceptions of patent claim breadth embodied by the doctrine of equivalents and the written description requirement create instability in the patent doctrine.

Next, and more practically, the expansion of the written description doctrine leaves the patentee with too little. After *Gentry Gallery* and *Eli Lilly*, the written description requirement all but requires that each claimed embodiment be described in the specification. Along the same lines, after *Eli Lilly* and *Ariad v. Eli*

⁶⁹ *Id.* at 738.

⁷⁰ *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997) (“In our view, the particular linguistic framework used is less important than whether the test is probative of the essential inquiry: Does the accused product or process contain elements identical or equivalent to each claimed element of the patented invention? Different linguistic frameworks may be more suitable to different cases, depending on their particular facts.”).

⁷¹ *Id.* at 28–29 (“We do, however, share the concern of the dissenters below that the doctrine of equivalents, as it has come to be applied since *Graver Tank*, has taken on a life of its own, unbounded by the patent claims. There can be no denying that the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement.”); *Id.* at 29–30 (“We concur with this apt reconciliation of our two lines of precedent. Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety. So long as the doctrine of equivalents does not encroach beyond the limits just described, or beyond related limits. . . we are confident that the doctrine will not vitiate the central functions of the patent claims themselves.”).

⁷² *Festo Corp.*, 535 U.S. at 723.

⁷³ *Id.*

Lilly,⁷⁴ it is difficult to see how a patentee could claim a genus even after reciting a “representative” number of species. Thus, the now heightened written description requirement pushes patents downstream and severely limits patenting in emerging technologies.

Finally, and likely as a consequence of the issues considered above, the written description requirement is unlikely to function as a long-term solution and there is much pushback against the written description requirement.⁷⁵

C. *The Enablement Requirement*

Courts have more recently begun to address preemption under the enablement requirement⁷⁶ by invalidating patent claims which are overly broad and do not

⁷⁴ *Ariad Pharms.*, 598 F.3d at 1336 (invalidating patent claims to a method comprising reducing Nuclear Factor Kappa B (NF-kB) activity in eukaryotic cells because the disclosure failed to provide adequate written description of the claims despite hypothesizing three classes of molecules potentially capable of reducing NF-kB activity).

⁷⁵ *Sequenom, Inc.*, 788 F.3d at 1381 (“But for the sweeping language in the Supreme Court’s *Mayo* opinion, I see no reason, in policy or statute, why this breakthrough invention should be deemed patent ineligible.”); *Ariad Pharms.*, 598 F.3d at 1362 (“The separate written description requirement that the court petrifies today has no statutory support The written descriptions of the invention and of the manner and process of making and using the invention are both judged by whether they are in such full, clear, concise, and exact terms as to enable a person skilled in the art to make and use the invention. The reason for a description doctrine is clear: to ensure that the inventor fully discloses the invention in exchange for an exclusive right. The test for the adequacy of the specification that describes the invention is also clear: Is the description sufficient to enable a person of ordinary skill in the art to make and use the claimed invention? Nowhere does the paragraph require that the inventor satisfy some quixotic possession requirement.”); Michael A. Leonard II, *The Death of the Written Description Requirement? Analysis and Potential Outcomes of the Ariad Case*, 158 INTEL. PROP. COUNSELOR ART. II (2010) (“While it is difficult to predict how a court will decide a case with respect to the written description requirement, there is a helpful history from CAFC judges that may tip their hand. From the unequivocal language of past opinions, it is clear that three of the judges believe there is no separate written description requirement. On the other side, Judge Lourie has unequivocally expressed his belief that a separate written description requirement does indeed exist. The judges that authored the opinion in *Ariad* are also likely to be against removing the written description requirement since they disagreed with Judge Linn’s suggestion to do so. Judge Newman has indicated it would be a public disservice to eliminate the written description requirement entirely, but she may be amenable to changing the requirement and favors the en banc rehearing. Judge Dyk favors articulating clear standards for the written description requirement that can be applied to all technologies. It is not clearly inferable from the known opinions of the judges that the written description requirement will be removed. Rather, it appears more likely that the opinion will be modified.”).

⁷⁶ 35 U.S.C. §112(a) (2012) (“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use

enable a person of ordinary skill in the art to make or use the claimed invention. However, addressing preemption under the enablement requirement suffers from many of the same issues as addressing preemption under the written description requirement.

“The term ‘undue experimentation’ does not appear in the statute, but it is well established that enablement requires that the specification teach those in the art to make and use the invention without undue experimentation. Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations.”⁷⁷ The factors to be considered in “determining whether a disclosure would require undue experimentation” include “the quantity of experimentation necessary, . . . the amount of direction or guidance presented, . . . the presence or absence of working examples, . . . the nature of the invention, . . . the state of the prior art, . . . the relative skill of those in the art, . . . the predictability or unpredictability of the art, and, . . . the breadth of the claims.”⁷⁸ For example, as in *In re Wands*, if there was a “high level of skill in the art at the time when the application was filed, and all of the methods needed to practice the invention were well known[,]” then experimentation required to practice the invention may not be undue.⁷⁹ In other words, that some experimentation is necessary does not preclude enablement.⁸⁰ Additionally, as in *Atlas Powder*, “[e]ven if some of the [embodiments disclosed by a patent are] inoperative, the claims are not necessarily invalid.” Rather, a claim may be invalid “if the number of inoperative [embodiments] becomes significant, and in effect forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention.”⁸¹

Like the written description requirement, the purpose of the enablement requirement is to preserve the *quid pro quo* of the patent system. Thus, the courts’ reinterpretation of the enablement requirement as a means to address preemption strains the enablement doctrine and creates many of the same issues as it does

the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.”).

⁷⁷ *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

⁷⁸ *Id.*

⁷⁹ *Id.* at 740.

⁸⁰ *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984).

⁸¹ *Id.* at 1576-77.

for the written description requirement. This can be seen in the Federal Circuit's recent decision in *Amgen v. Sanofi*, in which the Federal Circuit appeared to stretch the enablement requirement to address preemption in the context of natural phenomena, here, of antibodies that can bind.⁸² In *Amgen*, the court found that the patent claims at issue were adequately described under the written description requirement but not properly enabled under the enablement requirement. The court explained that the “enablement inquiry for claims that include functional requirements can be particularly focused on the breadth of those requirements, especially where predictability and guidance fall short.”⁸³ In particular, the court said it “is important to consider the quantity of experimentation that would be required to make and use, not only the limited number of embodiments that the patent discloses, but also the full scope of the claim.”⁸⁴ The court maintained, however, that the effort required by a person of ordinary skill in the art to exhaust a genus is not dispositive.⁸⁵ Still, the court said it was appropriate “to look at the amount of effort needed to obtain embodiments outside the scope of the disclosed examples and guidance.” Further, the court found that the “functional limitations [at issue in *Amgen* were] broad, the disclosed examples and guidance [were] narrow, and no reasonable jury could [have] concluded under [the] facts that anything but ‘substantial time and effort’ would [have] be[en] required to reach the full scope of [the] claimed embodiments.”⁸⁶

Amgen represents a recent turn in the enablement doctrine. After *Amgen*, it becomes more likely that any experimentation, not just undue experimentation, could invalidate a patent claim. Again, like the written description requirement, the turn to the enablement requirement to address concerns of preemption puts the enablement doctrine at odds with the doctrine of equivalents, potentially leaves the patentee with too little patent protection and is likely to result in pushback against an unstable enablement doctrine.

⁸² *Amgen Inc. v. Sanofi, Aventisub LLC*, 987 F.3d 1080, 1082-83 (Fed. Cir. 2021), *cert. granted in part sub nom. Amgen Inc. v. Sanofi*, 143 S.Ct. 399 (2022).

⁸³ *Id.* at 1086.

⁸⁴ *Id.*

⁸⁵ *Id.* at 1088.

⁸⁶ *Id.* at 1088.

III

WEAKNESSES OF POSSIBLE FUTURE APPROACHES TO ADDRESSING PREEMPTION

Currently, courts do not look to the novelty requirement, claim construction analysis, or the reverse doctrine of equivalents to address concerns of preemption. While it is possible that courts could do so, it is unlikely because none of these approaches provides an effective method of addressing preemption concerns.

A. *The Novelty Requirement*

Courts could attempt to address preemption by invalidating patent claims under the novelty requirement. However, the novelty requirement is not an effective tool to address concerns of preemption and is a less effective tool than the nonobviousness requirement as discussed in Section V below.

“Anticipation. . .requires that ‘each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.’”⁸⁷ “If [a] prior art reference does not expressly set forth a particular element of [a] claim, that reference still may anticipate if that element is ‘inherent’ in its disclosure [of the prior art reference].”⁸⁸ An element is inherent when extrinsic evidence makes clear that the element is necessarily present in the reference, and it would be so recognized by a person of ordinary skill in the art.⁸⁹ Inherency, however, “‘may not be established by probabilities or possibilities’” and “[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient.”⁹⁰ Like the nonobviousness requirement, the novelty requirement focuses on what is known to a person of ordinary skill in the art. It is true that a court could address preemption by invalidating overly broad patent claims in view of a single reference which discloses each and every element of the claim, including the preempting law of nature, natural phenomenon, or abstract idea. However, the novelty requirement is not an effective means of addressing preemption because it is unlikely that a prior art reference would disclose each and every element of a claim. Additionally, as discussed below, the nonobviousness requirement is a more effective means of

⁸⁷ *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ *Id.*

addressing preemption than the novelty requirement because the nonobviousness requirement considers the same prior art references together and in combination with the skill, common sense, and creativity of a person of ordinary skill in the art to determine whether the preempting law of nature, natural phenomenon, or abstract idea was previously known.

B. *Claim Construction Analysis*

Claim construction analysis is a strong mechanism by which courts can narrow patents' scope. Under claim construction analysis, courts can and do interpret patent claims narrowly.⁹¹ Additionally, claim construction policy supports interpreting claims narrowly.⁹² However, claim construction analysis is not an effective approach to address concerns of preemption specifically because the doctrine deemphasizes external constraints.

Claim construction analysis is driven both by the language of a patent and by the background scientific and technological understanding.⁹³ “[T]he words of a claim ‘are generally given their ordinary and customary meaning’” *i.e.*, “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.”⁹⁴ The ordinary and customary meaning of the claim term as determined by a person of ordinary skill in the art governs because of the “well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read by others of skill in the pertinent art.”⁹⁵ “In some cases, the ordinary meaning of

⁹¹ See *e.g.*, *Nystrom v. TREX Co.*, 424 F.3d 1136 (Fed. Cir. 2005).

⁹² See *infra* pp. 26-28.

⁹³ *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 33 (1966) (“It is, of course, well settled that an invention is construed not only in the light of the claims, but also with reference to the file wrapper or prosecution history in the Patent Office. . . Claims as allowed must be read and interpreted with reference to rejected ones and to the state of the prior art; and claims that have been narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated from the patent.”).

⁹⁴ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (“We have frequently stated that the words of a claim ‘are generally given their ordinary and customary meaning.’ . . . We have made clear, moreover, that the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.”).

⁹⁵ *Id.* at 1313 (“The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation. [citation omitted]. . . That starting point is

claim language as understood by a person of skill in the art may be readily apparent [to the court], and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.”⁹⁶ However, more often, the meaning of a claim term as understood by persons of skill in the art is not immediately apparent. In these cases, courts must look beyond the words of the claims themselves to the specification and the prosecution history of the patent.⁹⁷ Secondly, courts may also look to extrinsic evidence concerning “‘relevant scientific principles, the meaning of technical terms, and the state of the art’” to determine the meaning of the claim terms.⁹⁸ However, the Federal Circuit cautions against undue reliance on extrinsic evidence because such reliance “poses the risk that [the extrinsic evidence] will be used to change the meaning of claims in derogation of the ‘indisputable public records consisting of the claims, the specification and the prosecution history,’ thereby undermining the public notice function of patents.”⁹⁹

The Supreme Court’s decision in *Nautilus v. Biosig* supports using claim construction analysis to construe claims narrowly. In *Nautilus*, the Supreme Court overruled the Federal Circuit’s test for claim definiteness for being too permissive. Under the Federal Circuit test, a patent claim was sufficiently definite so long as the claim was “‘amenable to construction,’ and the claim, as construed, [was] not ‘insolubly ambiguous.’” The Supreme Court replaced the Federal Circuit’s insolubly ambiguous test and held that “a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”¹⁰⁰ The Supreme Court did leave

based on the well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read by others of skill in the pertinent art.”)

⁹⁶ *Id.* at 1314.

⁹⁷ *Id.* at 1313.

⁹⁸ *Id.* at 1314.

⁹⁹ *Nystrom*, at 1143 (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1319).

¹⁰⁰ *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014) (“According to the Federal Circuit, a patent claim passes the §112, ¶ 2 threshold so long as the claim is ‘amenable to construction,’ and the claim, as construed, is not ‘insolubly ambiguous.’ [citation omitted]. . . In place of the ‘insolubly ambiguous’ standard, we hold that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention. Expressing no opinion on the validity of the patent-in-suit, we remand, instructing the Federal Circuit to decide the case employing the standard we have prescribed.”).

some room for interpretation within the definiteness standard, explaining that the definiteness requirement “mandates clarity, while recognizing that absolute precision is unattainable[,]” and the standards adopted by the courts allow that the “the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter.”¹⁰¹ However, *Nautilus* still pushed for a narrower interpretation of claims. While *Nautilus* is a claim validity decision made under the claim definiteness requirement,¹⁰² the policy of the decision carries over to claim construction decisions. Both claim construction analysis and claim validity analysis require evaluating claim meaning from the perspective of a person of ordinary skill in the art and reading claims, at least in part, based on a patent’s specification and prosecution history.¹⁰³ As a result, the Supreme Court’s reasoning in *Nautilus* can provide guidance to courts during claim construction.

It is true that courts can narrowly interpret claims under the claim construction doctrine by limiting the scope of a claim term to only a subset of possible interpretations of that term. For example, in *Nystrom v. TREX*, the Federal Circuit found that an examination of the term “board” “in the context of the written description and prosecution history of the [] patent” at issue led to the conclusion that the term “board” “must be limited to wood cut from a log.”¹⁰⁴ The Court explained that despite broader dictionary definitions of the term “board,” the patentee was “not entitled to a claim construction divorced from the context of the written description and prosecution history” which consistently used the

¹⁰¹ *Id.* at 910 (“To determine the proper office of the definiteness command, therefore, we must reconcile concerns that tug in opposite directions. Cognizant of the competing concerns, we read §112, ¶ 2 to require that a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty. The definiteness requirement, so understood, mandates clarity, while recognizing that absolute precision is unattainable. The standard we adopt accords with opinions of this Court stating that the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter.”).

¹⁰² 35 U.S.C. §112(b) (2012) (“The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.”).

¹⁰³ *Nautilus*, 572 U.S. at 908 (“Although the parties here disagree on the dispositive question—does the ’753 patent withstand definiteness scrutiny—they are in accord on several aspects of the §112, ¶ 2 inquiry. First, definiteness is to be evaluated from the perspective of someone skilled in the relevant art. [citation omitted] . . . Second, in assessing definiteness, claims are to be read in light of the patent’s specification and prosecution history. [citations omitted] Third, definiteness is measured from the viewpoint of a person skilled in the art at the time the patent was filed.”).

¹⁰⁴ *Nystrom*, 424 F.3d at 1143.

term “board” to refer to wood decking materials cut from a log.¹⁰⁵ This general claim narrowing may have some overlap with limiting preemption. Still, claim construction is not an optimal mechanism by which courts can address concerns of preemption. Claim construction doctrine consistently deemphasizes extrinsic evidence.¹⁰⁶ Thus, while claim construction analysis can effectively narrow patent claims based on the patentee’s own characterization of the invention, the doctrine is neither designed to nor actually addresses concerns of preemption.

C. *The Reverse Doctrine of Equivalents*

Courts could address preemption under the reverse doctrine of equivalents.¹⁰⁷ However, the reverse doctrine of equivalents is unlikely to be an effective method of addressing preemption because it does not operate prospectively. In other words, the reverse doctrine of equivalents is not a method of invalidating overly broad patent claims that may preempt future innovation, but, rather, provides a defense to infringement in certain cases.¹⁰⁸

Like the doctrine of equivalents, the reverse doctrine of equivalents is premised on the inherent limits of language. Because of the inescapable imprecision of language, the literal terms of a claim may cover a product that is so far removed from the patentee’s actual invention that it should not be covered by the patent. Thus, despite the product satisfying each and every limitation of a patent claim, it does not conflict with the spirit and intent of the patent.¹⁰⁹

¹⁰⁵ *Id.* at 1144-45.

¹⁰⁶ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1320 (Fed. Cir. 2005) (“Although the concern expressed by the court in *Texas Digital* was valid, the methodology it adopted placed too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the specification and prosecution history.”).

¹⁰⁷ *See Boyden Power-Brake Co. v. Westinghouse*, 170 U.S. 537 (1898).

¹⁰⁸ *See infra* pp. 28-29.

¹⁰⁹ *Westinghouse*, 170 U.S. at 568 (“We have repeatedly held that a charge of infringement is sometimes made out, though the letter of the claims be avoided. [citations omitted] The converse is equally true. The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to be adjudged an infringer as one who has violated the letter of a statute has to be convicted, when he has done nothing in conflict with its spirit and intent.”); *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1581 (Fed. Cir. 1991) (“The so-called ‘reverse doctrine of equivalents’ is an equitable doctrine invoked in applying properly construed claims to an accused device. Just as the purpose of the ‘doctrine of equivalents’ is to prevent ‘pirating’ of the patentee’s invention [citations omitted]. . .so the

While the reverse doctrine of equivalents is not often cited by courts, the doctrine could provide an effective method by which courts can avoid finding patent infringement where the asserted patent includes broad claims which preempt the use of a law of nature, natural phenomenon, or abstract idea. In such instances, a product could apply a law of nature which has been claimed and potentially preempted by a previous patent because, despite the product likely falling into the literal language of the patent, it does not conflict with the spirit and intent of the patent and therefore does not infringe. Despite its utility as a backstop against infringement of preemptive patent claims, the reverse doctrine of equivalents is not itself a tool to prevent preemption.

IV

PROMISE OF THE NONOBVIOUSNESS REQUIREMENT TO ADDRESS PREEMPTION

Courts should address preemption by invalidating patent claims under the nonobviousness requirement.¹¹⁰ In *Graham v. John Deere* and *KSR v. Teleflex*, the Supreme Court held that nonobviousness should be analyzed under a fact-driven, totality of the circumstances approach.¹¹¹ Additionally, the Court emphasized that nonobviousness determinations should be based not only on individual prior art references to the patented invention but also the skill, common sense, and creativity possessed by a person of ordinary skill in the art.¹¹² Following this reasoning, courts can address preemption under the nonobviousness requirement by expanding the scope of the prior art to a patent under the teachings of *John Deere* and *KSR*.

purpose of the ‘reverse’ doctrine is to prevent unwarranted extension of the claims beyond a fair scope of the patentee’s invention.”).

¹¹⁰ 35 U.S.C. §103 (2013) (“A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.”).

¹¹¹ See *Graham v. John Deere* 383 U.S. 1; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 390 (2007).

¹¹² *Id.*

A. *Overview of the Nonobviousness Requirement*

The Supreme Court's decisions in *Graham* and *KSR* established a flexible and fact-based approach to patent claim validity under the nonobviousness requirement and laid the groundwork for courts to effectively address preemption by invalidating patent claims under the nonobviousness requirement.

The Supreme Court considered the nonobviousness requirement in *Graham v. John Deere* in 1966.¹¹³ In *Graham*, the Supreme Court found that nonobviousness analysis relies on three basic factual inquiries – “the scope and content of the prior art. . . differences between the prior art and the claims at issue. . . and the level of ordinary skill in the pertinent art.”¹¹⁴ The Supreme Court additionally found that secondary considerations including “commercial success, long felt but unsolved needs, [and] failure of others. . . might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” “As indicia of obviousness or nonobviousness, these inquiries may have relevancy.”¹¹⁵

After *Graham*, the Federal Circuit adopted the teaching, suggestion, or motivation (“TSM”) test. Under the TSM test, “a patent claim [was] only proved obvious if the prior art, the problem’s nature, or the knowledge of a person having ordinary skill in the art reveals some motivation or suggestion to combine the prior art teachings.”¹¹⁶ In other words, under the TSM test, “unless the prior art references addressed the precise problem that the patentee was trying to solve, the problem would not motivate an inventor to look at those references.”¹¹⁷

Then, in 2007, the Supreme Court decided *KSR v. Teleflex*. In *KSR*, The Supreme Court did away with the Federal Circuit’s TSM test as too rigid and formulaic.¹¹⁸ In place of the TSM test, the Court maintained the fact-based

¹¹³ *See id.*

¹¹⁴ *Id.* at 17.

¹¹⁵ *Id.* at 17-18.

¹¹⁶ *KSR*, 550 U.S. at 398.

¹¹⁷ *Id.* at 400.

¹¹⁸ *Id.* at 419 (“Helpful insights, however, need not become rigid and mandatory formulas; and when it is so applied, the TSM test is incompatible with our precedents. The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way.”).

approach developed in *Graham* but rejected the bright line rule proposed by the Federal Circuit.¹¹⁹ The Supreme Court found that “[i]n determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls.” “What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under [the nonobviousness requirement].”¹²⁰ Further, the Supreme Court found that “[t]he question [courts must consider] is not whether the combination was obvious to the patentee but whether the combination [would have been] obvious to a person [of] ordinary skill in the art.” “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”¹²¹ To this end, the Supreme Court found that the combination of “familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”¹²²

In *KSR*, the Supreme Court also clarified the characteristics of a person of ordinary skill in the art. This person is not only a person of ordinary skill but “is also a person of ordinary creativity, not an automaton.”¹²³ Additionally, “a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” “If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense” which the person has. Additionally, common sense teaches that “familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle.”¹²⁴

B. Implications of the Nonobviousness Doctrine

The Supreme Court’s decisions in *Graham* and *KSR* allow courts to comprehensively address preemption under the nonobviousness requirement because the decisions expand the scope of prior art to a patent and establish a flexible yet stable nonobviousness doctrine.

¹¹⁹ *Id.* at 426.

¹²⁰ *Id.* at 419.

¹²¹ *Id.* at 420.

¹²² *Id.* at 416.

¹²³ *Id.* at 421.

¹²⁴ *Id.* at 420.

It has always been possible for courts to address preemption under the nonobviousness requirement. Any patent claim to an obvious law of nature, natural phenomenon, or abstract idea is necessarily invalid under the nonobviousness requirement. In other words, if a law of nature, natural phenomenon, or abstract idea falls within the scope of the prior art, then a patent cannot claim and therefore cannot preempt future use of that law, phenomenon, or idea. Thus, a court could always address preemption by invalidating patent claims to obvious laws of nature, natural phenomena, and abstract ideas.

Courts can address preemption more effectively under the Supreme Court's refined nonobviousness doctrine. The Supreme Court's doctrine broadens the scope of the prior art to a patent and therefore allows courts to invalidate a greater number of obvious claims directed to laws of nature, natural phenomena, and abstract ideas under the nonobviousness requirement. The scope of the prior art to a patent can be manipulated in two ways. The first is to vary the number of individual references which fall into the prior art. The second is to regulate how broadly each individual reference is read. Thus, varying the scope of the prior art to a patent does not require changing the test for prior art. Rather, courts can increase the scope of the prior art as a whole by considering more inferences from and combinations of individual prior art references.

After overruling the Federal Circuit's TSM test, the Supreme Court adopted an approach to resolving the scope of the prior art to a patent, guided not only by individual prior art references themselves but also by more general factors such as the skill, common sense, and creativity of a person of ordinary skill in the art. Additionally, the Supreme Court, in *KSR*, emphasized that the skill, common sense, and creativity of a person of ordinary skill in the art is high.¹²⁵ Thus, the scope of the prior art is expanded under the Supreme Court's nonobviousness doctrine because the prior art includes not only individual prior art references but also inferences from the prior art references that could be made by a person of ordinary skill, common sense, and creativity in the art. When the skill, common sense, and creativity of a person of ordinary skill in the art is properly considered

¹²⁵ *Id.* at 422 (“A person having ordinary skill in the art could have combined Asano with a pedal position sensor in a fashion encompassed by claim 4, and would have seen the benefits of doing so.”); *Id.* at 425 (“The prior art discussed above leads us to the conclusion that attaching the sensor where both *KSR* and *Engelgau* put it would have been obvious to a person of ordinary skill.”).

alongside individual prior art references, the scope of the prior art grows because inferences from and combinations of the individual prior art references become obvious. When the scope of the prior art to a patent is broadened, more laws of nature, natural phenomena, and abstract ideas fall into the prior art and are therefore made obvious by the prior art. Thus, courts can invalidate, under the nonobviousness requirement, more claims which preempt obvious laws of nature, natural phenomena, and abstract ideas.

The Supreme Court's expansion of the nonobviousness requirement creates stability and flexibility in the nonobviousness doctrine that allows courts to actively address preemption under the nonobviousness requirement without creating tension within the nonobviousness doctrine or within patent law doctrine more broadly. To address preemption by invalidating claims under the nonobviousness requirement, courts need not go beyond the Supreme Court's approach to nonobviousness as it stands after *KSR* and *Graham*. Courts need only apply the test as set forth by the Supreme Court. *KSR* and *Graham* are both liberal decisions which grant courts leeway to resolve the scope of the prior art of a patent including the laws of nature obvious to a person of ordinary skill in the art under a fact driven and totality of the circumstances approach. To this end, neither case offers a bright line rule, and in fact, the Supreme Court in *KSR* overruled the Federal Circuit's bright-line TSM test. However, at present, courts do not use *KSR* to its full potential because courts do not adequately consider the skill, common sense, and creativity of persons of ordinary skill in the art. Courts should read prior art broadly in view of *KSR* and *Graham* not only because this approach will help courts protect against preemption but also because the Supreme Court's decisions in those cases better reflect how inventors and persons of ordinary skill in the art would actually approach inventions.

C. *An Example of the Nonobviousness Requirement in Use*

In 2021, the Federal Circuit decided *Yu v. Apple*. Yu alleged that defendants Apple and Samsung infringed claims 1, 2, and 4 of U.S. Patent No. 6,611,289.¹²⁶ Claim 1, which was treated as representative for the purposes of eligibility recited:

An improved digital camera comprising:

¹²⁶ *Yu v. Apple Inc.*, 1 F.4th 1040 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 1113 (2022).

a first and a second image sensor closely positioned with respect to a common plane, said second image sensor sensitive to a full region of visible color spectrum;

two lenses, each being mounted in front of one of said two image sensors;

said first image sensor producing a first image and said second image sensor producing a second image;

an analog-to-digital converting circuitry coupled to said first and said second image sensor and digitizing said first and said second intensity images to produce correspondingly a first digital image and a second digital image;

an image memory, coupled to said analog-to-digital converting circuitry, for storing said first digital image and said second digital image; and

a digital image processor, coupled to said image memory and receiving said first digital image and said second digital image, producing a resultant digital image from said first digital image enhanced with said second digital image.¹²⁷

The district court and the Federal Circuit decided the case under the patentable subject matter requirement. The district court found that the claims “were directed to ‘the abstract idea of taking two pictures and using those pictures to enhance each other in some way[,]’” and that “‘photographers ha[ve] been using multiple pictures to enhance each other for over a century.’”¹²⁸ The court therefore concluded that “the asserted claims lack[ed] an inventive concept, noting ‘the complete absence of any facts showing that the[] [claimed] elements were not well-known, routine, and conventional.’”¹²⁹ The Federal Circuit affirmed.

¹²⁷ *Id.* at 1042.

¹²⁸ *Id.* (quoting *Yu v. Apple Inc.*, Nos. 18-cv-6181, 18-cv-6339, 2020 WL 1429773, at *3 (N.D. Cal. Mar. 24, 2020)).

¹²⁹ *Id.* (quoting *Yu*, 2020 WL 1429773, at *6).

However, the case could have been decided under the nonobviousness requirement. The Federal Circuit found, and Yu did not dispute, that “the idea and practice of using multiple pictures to enhance each other has been known by photographers for over a century.”¹³⁰ Additionally, the claim at issue recited only conventional camera components “to effectuate the resulting ‘enhanced’ image—two image sensors, two lenses, an analog-to-digital converting circuitry, an image memory, and a digital image processor[.]” and, “as claimed, these conventional components perform only their basic functions.”¹³¹ Both the abstract idea of using multiple pictures to enhance each other and the execution via the components of the Yu camera were obvious in light of the prior art. As the court finds, the Yu camera only combined already known techniques in the art. Thus, the claim to the camera at issue would be invalid under the nonobviousness requirement and as a result the patentee would not be able to preempt the abstract idea of using multiple pictures to enhance each other.

V

DOCTRINAL AND PRACTICAL ADVANTAGES OF THE NONOBVIOUSNESS REQUIREMENT

The nonobviousness requirement has numerous doctrinal advantages over the written description requirement, enablement requirement, and patentable subject matter requirement. The nonobviousness doctrine is better suited to address concerns of preemption than the written description requirement and the enablement requirement and should replace both as a tool for addressing preemption. Also, the nonobviousness requirement can be more straightforwardly applied to address preemption than the patentable subject matter requirement and should be a preferred method of addressing preemption over the patentable subject matter requirement. Finally, the nonobviousness requirement provides practical advantages over other methods of addressing preemption because it is easy for courts, the U.S. Patent and Trademark Office, and the patent bar to apply and because the Patent Office can narrow patent claims initially during prosecution of the patent.

¹³⁰ *Id.* at 1043.

¹³¹ *Id.*

A. *Doctrinal Advantages Over the Written Description Requirement and Enablement Requirement*

Courts should address preemption by invalidating claims under the nonobviousness requirement instead of invalidating claims under the written description requirement or the enablement requirement. Addressing preemption under the nonobviousness requirement rather than the written description requirement or enablement requirement has numerous benefits. First, the nonobviousness doctrine, as it stands today, is not at odds, in terms of doctrine or policy, with any other patent law doctrine. As a result, the nonobviousness requirement is a more reliable and long-term solution. Next, the nonobviousness requirement does not leave the patentee with too little. So long as patentees achieve enough of an inventive step beyond the prior art, their innovations are patentable. Finally, courts' use of the written description requirement and the enablement requirements as a means to address preemption has destabilized both doctrines. In contrast, the nonobviousness requirement is well-suited to address preemption. As a result, courts using the nonobviousness requirement to address concerns of preemption do not destabilize the doctrine but rather utilize it for its very purpose.

B. *Doctrinal Advantages Over the Patentable Subject Matter Requirement*

While the patentable subject matter requirement is an effective tool for addressing preemption, the nonobviousness requirement is a superior tool because the nonobviousness requirement can be more easily utilized to address preemption.

First, invalidating patent claims under the nonobviousness requirement does not tend to disrupt whole areas of innovation because what is nonobvious in view of the prior art is necessarily tailored to each individual invention and its specific claimed limitations.¹³² Courts can address preemption in claims including

¹³² See e.g., *Eisai Co. v. Dr. Reddy's Lab'ys, Ltd.*, 533 F.3d 1353, 1356 (Fed. Cir. 2008) ("Obviousness under 35 U.S.C. §103(a) is ultimately a legal question, based on underlying factual determinations. [Citation omitted]. . . The factual determinations underpinning the legal conclusion of obviousness include 1) the scope and content of the prior art, 2) the level of ordinary skill in the art, 3) the differences between the claimed invention and the prior art, and 4) evidence of secondary factors, also known as objective indicia of non-obviousness."); *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) ("An obviousness determination is not the result of a rigid formula disassociated from the consideration of the facts of a case. Indeed, the common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not.").

physical structure using the nonobviousness requirement without creating strain in the nonobviousness doctrine. This is because the nonobviousness requirement applies with equal force to laws of nature, natural phenomena, and abstract ideas as well as to specific structures and processes implementing those laws, phenomena, and ideas. The flexibility of the nonobviousness doctrine is advantageous because after *American Axle*, courts continue to disagree about the applicability of the patentable subject matter requirement to claims directed to physical structures. For example, in *Apple v. Yu*, the claim at issue was to a physical camera. The court in *Yu* found that the camera was directed to an unpatentable law of nature, natural phenomenon, or abstract idea and the camera did not include an “inventive concept sufficient to transform the claimed abstract idea into a patent-eligible invention.”¹³³ The court argued that “whether a device is ‘a tangible system...’ is not dispositive.”¹³⁴ However, the dissent in *Yu* pushed back, arguing that the claim was to a “digital camera having two lenses mounted in front of separate image sensors, with analog to digital conversion circuitry, a memory that stores the images, and a digital processor that enhances the images.” Therefore, said the dissent, the claimed camera was “a mechanical and electronic device of defined structure and mechanism... not an ‘abstract idea.’”¹³⁵ Finally, the nonobviousness requirement is superior to the patentable subject matter requirement because nonobviousness doctrine is stable.

It is true that not all instances of preemption can be addressed under the nonobviousness requirement. For example, in some cases, a patentee may claim a law of nature, natural phenomenon, or abstract idea that would not have been obvious to a person of ordinary skill in the art, even under the high threshold for nonobviousness set by *Graham* and *KSR*. In such situations, the invention would not be obvious to a person of ordinary skill in the art because the law of nature, natural phenomenon, or abstract idea is nonobvious. Thus, the nonobviousness requirement would not address the potentially preemptive patent. In these residual cases, courts can turn to the patentable subject matter requirement to invalidate the claim as directed to a law of nature, natural phenomena, or abstract idea.

¹³³ *Yu*, 1 F.4th at 1045.

¹³⁴ *Id.* at 1113.

¹³⁵ *Id.* at 1046.

C. Practical Advantage of Ease of Application

Unlike the patentable subject matter requirement, the written description requirement, and the enablement requirement, the nonobviousness requirement is easy for courts, the U.S. Patent and Trademark Office, and the patent bar to apply. First, the case law surrounding the nonobviousness requirement is relatively static. After the Supreme Court decided *KSR* in 2007, neither the Supreme Court nor the Federal Circuit have significantly changed or modified the nonobviousness doctrine. However, both the Supreme Court and the Federal Circuit continue to decide patentable subject matter requirement, written description requirement, and enablement requirement cases which result in shifting doctrine. This makes the law much more difficult to apply. Additionally, the nonobviousness requirement analysis is focused on the knowledge possessed by a person of ordinary skill in the art. Courts, the Patent Office, and the bar can develop an idea of the knowledge possessed by a person of ordinary skill in the art. Members of the bar often discuss patent applications with the inventors of the patented invention. The inventors work in the art and therefore understand and can explain what a person of ordinary skill in the art would know. Members of the bar as well as patent examiners and administrative patent judges at the Patent Office may themselves work in the art and be familiar with what a person of ordinary skill in the art would know. Additionally, courts and administrative patent judges at the Patent Office can look to experts, who also work in the art, to explain what a person of ordinary skill in the art would know.

D. Practical Advantage of Consideration at the U.S. Patent and Trademark Office

Because the nonobviousness requirement is a patentability requirement, the nonobviousness requirement not only can be used by courts to invalidate claims during adversarial proceedings but also can be used by the U.S. Patent and Trademark Office to narrow claims and address preemption during prosecution of a patent. In fact, it must be remembered that the primary responsibility for sifting out unpatentable material lies in the Patent Office. To await litigation is, for all practical purposes, to debilitate the patent system. Additionally, there is no change in the general strictness with which the overall test for nonobviousness is to be applied between the courts and the Patent Office.¹³⁶ Thus, if courts adopted

¹³⁶ *Graham*, 383 U.S. at 19.

a heightened standard for nonobviousness, the Patent Office would also adopt the same heightened standard.

Narrowing patent scope and addressing preemption at the Patent Office by invalidating claims under the nonobviousness requirement is useful because it prevents overly broad patents, which would preempt future innovation from issuing in the first place. As a result, competitors are not potentially disincentivized from inventing by seeing overly broad patents in the market. Additionally, patent owners are less likely to bring ultimately losing lawsuits because the narrower scope of the issued patent precludes other inventions from infringing the patent in the first place. Additionally, patent examiners at the Patent Office invalidating patents under a strict application of the nonobviousness requirement would also help narrow patent scope under claim construction analysis, application of the doctrine of equivalents, and claim invalidation under the patentable subject matter requirement because each of these analyses considers prior art as understood by a person of ordinary skill in the art.

While claims should be invalidated under the nonobviousness requirement at the Patent Office, the Patent Office cannot replace courts and become the only forum in which the nonobviousness requirement is strictly applied. First, the Patent Office is under-resourced.¹³⁷ Therefore, patent examiners at the Patent Office may not be able to conduct a strict application of the nonobviousness analysis under the case-by-case approach to the same degree that a court would be able to. On the other hand, under the adversarial system of the court, both parties have the resources to pursue a nuanced and case-by-case analysis of obviousness in view of metrics difficult to ascertain, like general knowledge and common sense. Additionally, resolving these issues in court may be a better use of resources because resources to conduct such thorough analyses would not be expended on patents that are never referenced by competitors and never litigated.

CONCLUSION

Courts should address preemption by invalidating overly broad patent claims under the nonobviousness requirement. Overly broad patent claims harm the patent

¹³⁷ *Id.* at 18 (“In this connection we note that the Patent Office is confronted with a most difficult task. Almost 100,000 applications for patents are filed each year. Of these, about 50,000 are granted and the backlog now runs well over 200,000.”).

system by disincentivizing future innovation. In particular, overly broad patent claims can preempt future innovation by tying up fundamental scientific and technological concepts. The nonobviousness requirement is the best approach for addressing preemption because it is effective, avoids the problems associated with current approaches to addressing preemption, including the patentable subject matter requirement, the written description requirement, and the enablement requirement, and promises to be a better option than alternative future approaches to addressing preemption, such as the novelty requirement, claim construction analysis, and the reverse doctrine of equivalents.