

A SURPRISINGLY USEFUL REQUIREMENT

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INTRODUCTION

For 220 years, the Patent Act has required patentable inventions to be “new and useful.”¹ For almost as long, courts have struggled with difficult questions about what to protect by patent and what to leave in the public domain.² Patent laws provide a variety of rules to help draw these lines,³ but the very nature of translating an inventive principle into written form complicates courts’ decisionmaking. As a result, consistent application of patent law can often involve guesswork and hand waving at the margins of difficult cases.⁴

There are many principled ways to make headway through such doctrinal thickets. Some look to economic analysis and others to natural rights, while still others focus primarily on patentability criteria such as newness and disclosure.⁵

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¹ 35 U.S.C. § 101 (2006) (“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 . . .”).

² *Compare* *Diamond v. Chakrabarty*, 447 U.S. 303, 308-10 (1980) (holding human-made bacteria to be patentable for being “manufacture[d]” (internal quotation marks omitted)), *with* *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130-31 (1948) (holding the inhibitive qualities of a bacteria to be a natural process and therefore not patentable). *See also* *O’Reilly v. Morse*, 56 U.S. (15 How.) 62, 112-21 (1854) (holding a patent for all applications of electric current into typographic characters to be invalid for being a natural principle as well as too broad in scope and therefore “unjust to the public”).

³ In addition to being new and useful, patents must not be obvious, they must fall into a patent-eligible subject matter, and their inventors must describe and enable one to make and use the claimed invention. 35 U.S.C. §§ 101, 103(a), 112.

⁴ *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419-22 (2007) (criticizing the Federal Circuit’s teaching-suggestion-motivation test but failing to provide a concrete test to replace it).

⁵ *Ritchie v. Vast Res., Inc.*, 563 F.3d 1334, 1336 (Fed. Cir.) (discussing the relationship between patents, commercial value, market entry, and obviousness), *cert. denied*, 130 S. Ct. 269 (2009); *Arachnid, Inc. v. Merit Indus., Inc.*, 939 F.2d 1574, 1578 (Fed. Cir. 1991) (describing a patent as expanding one’s natural property right after invention); *In re Greer*, 484 F.2d 488, 490-91 (C.C.P.A. 1973) (discussing the adequacy of a patent’s disclosure and newness compared with other similar patents).

In the broad scheme of things, however, the requirement that an invention be useful has been nearly nonexistent—essentially ignored.⁶ The level of “utility” an applicant must currently demonstrate to obtain a patent is extremely low: the invention need only operate as described and potentially provide some *de minimis* public benefit.⁷ Patent applications that fail to meet this standard are rare, usually claiming perpetual-motion machines, chemicals with unknown effects, and other fantastic concepts. As a result of this relatively low bar to patentability, courts and commentators have never considered an invention’s usefulness to be an overarching principle that can help decide difficult questions about what should be patented.

Ignoring usefulness is a mistake. Usefulness can be—and in some ways already is—surprisingly helpful in patent law and policy. This Article’s goal is to show how usefulness is not only relevant to patentability, but also critical to it. Usefulness can underlie a principled approach to resolving longstanding doctrinal questions, it can resolve close factual questions of patentability, it can explain existing rules, and it can provide meaning to vague statutory requirements. The doctrine is especially helpful at the margins, where courts consider policy in deciding close cases; usefulness can often put a thumb on the scale.

To be sure, usefulness does not answer every question, and in some cases it can only provide guidance rather than resolution. Even so, this Article presents the first comprehensive illustration of how some difficult fundamental questions become answerable when viewed through the lens of usefulness. The analysis is descriptive in part and normative in part. Some rules already implicitly or explicitly consider usefulness, and some rules should start doing so.

A. *Usefulness and Utility*

Usefulness is distinct in application from the traditional patent utility requirement. Usefulness refers generally to an invention’s benefits, which might vary by type, quantity, or timing. Usefulness can mean many things, such as how an invention operates, the practical benefits it provides to the public, or its effect on commercial markets, such as the supply or demand for a particular product.

Because the Patent Act requires inventions to be “new and useful,”⁸ they must show some minimal usefulness, but the statute’s utility require-

⁶ John F. Duffy, *Patent Utility Reduxit*, JOTWELL (May 5, 2010, 12:08 PM), <http://ip.jotwell.com/patent-utility-reduxit/> (reviewing Michael Risch, *Reinventing Usefulness*, 2010 BYU L. REV. 1195 (2010)).

⁷ See *Brenner v. Manson*, 383 U.S. 519, 533 (1966) (adopting current practical utility standard); see also discussion *infra* Part IV.

⁸ 35 U.S.C. § 101.

ment (as currently interpreted) is only a part of an invention's usefulness. This Article calls the traditional utility requirement "eligibility usefulness" or "utility."⁹ This Article introduces the concept of "input usefulness" as opposed to eligible usefulness. Input usefulness more generally considers *all* of an invention's benefits, as well as the amount and timing of those benefits. In this Article, the term "usefulness" signifies input usefulness, as distinguished from utility. The way that usefulness informs patent policy may be quite different than the gatekeeping role of the traditional utility requirement. Eligible utility tests only consider operable and practical usefulness, only evaluate at the time of invention, and only require a de minimis quantity. Usefulness as an input is unbounded: a court may consider any type of usefulness, at any time, and in any amount, if doing so helps resolve patentability questions. Usefulness allows for a more generalized consideration of an invention's benefits than the traditional utility requirement does.

B. *An Introductory Example*

The recent Supreme Court *Bilski v. Kappos*¹⁰ case provides an example of doctrinal difficulty that might have been aided if the Court had evaluated usefulness. In *Bilski*, the Court struggled to determine whether a patent-eligible "process" under 35 U.S.C. § 101 encompasses methods of doing business.¹¹ The controversy was not so much that "process" was insolubly ambiguous, because all nine justices agreed that the generally accepted definition of "process" is incredibly broad.¹² Instead, the Court focused on whether it should rein in Section 101's literal breadth and exclude business methods from patentability.¹³ Four concurring justices would have banned business methods outright as a matter of history and policy.¹⁴ The majority, however, ruled that business methods *might* be a patentable "process" but that *Bilski*'s particular method was too abstract.¹⁵ The majority purported to strictly apply the language of Section 101,¹⁶ but in fact, the statute contains no explicit provision that excepts abstract processes.

The *Bilski* Court left open many doctrinal questions, such as how one should determine when a method is too abstract to be patentable and whether there should be other (or any) unwritten patent eligibility exceptions. One

⁹ Courts and commentators frequently call eligibility usefulness, *utility*, as shorthand. *E.g.*, *Brenner*, 383 U.S. at 529.

¹⁰ 130 S. Ct. 3218 (2010).

¹¹ *Bilski*, 130 S. Ct. at 3228.

¹² *Id.* at 3226; *id.* at 3237 (Stevens, J., concurring).

¹³ *Id.* at 3228-29 (majority opinion).

¹⁴ *Id.* at 3232 (Stevens, J., concurring).

¹⁵ *Id.* at 3228-30 (majority opinion).

¹⁶ *Bilski*, 130 S. Ct. at 3231.

patent examiner memorably described the uncertainty: “I’ll tell you what, I wish I could write 101 rejections with as little supporting analysis as the Supreme Court did in the *Bilski* decision. A little discussion of precedential caselaw . . . some hand-waving, and the conclusion that the claims at issue are drawn to an abstract idea.”¹⁷

Usefulness can supplement the *Bilski* holding by providing guidelines for determining whether a claim is too abstract to be patentable. In *Bilski*, the representative claim involved the steps of initiating commodities transactions at one price, identifying other parties who might transact at a different price, and initiating transactions at that second price.¹⁸ This, the Supreme Court ruled, was hedging, an abstract idea and thus unpatentable.¹⁹

It is difficult to find principled support for the Court’s ruling, however, when one applies common language usage to *Bilski*’s claim. The term “abstract” means “generalized” as opposed to “concrete” and “specific.”²⁰ Using this definition, *Bilski*’s method for commodities trading was not “abstract” because it required three specific and concrete steps.²¹ It is certainly no less specific and concrete than another patent’s broadly described method for making alcohol by mixing molasses and water,²² which most observers would say is not abstract. Both claims were broad and general; the only difference between the two is that *Bilski*’s method’s steps involved people and money, while the alcohol patent’s method’s steps involved physical ingredients. Why the law should consider one set of generally described steps abstract and another concrete is unclear, especially given that money is ultimately physical currency, and the commodities at issue in *Bilski* were energy products.²³

Usefulness can put flesh on the bone of the *Bilski* Court’s abstractness prohibition and even serve as a replacement for that rule when courts apply

¹⁷ *Bilski Fallout*, JUST_N_EXAMINER (June 30, 2010, 11:09 PM), <http://just-n-examiner.livejournal.com/44111.html>. The writer continued to explain that:

Actually, it didn’t even seem like a conclusion, it very much seemed as if the decision that the claims were drawn to an abstract idea was the starting point of the Court’s deliberations. What that means, unfortunately, is that there was no analysis of how they reached that conclusion, and I really would like to have seen that type of analysis.

Id.

¹⁸ *Bilski*, 130 S. Ct. at 3223-24.

¹⁹ *Id.* at 3231.

²⁰ *Abstract Definition*, DICTIONARY.COM, <http://dictionary.reference.com/browse/abstract> (last visited Sept. 20, 2011).

²¹ *Bilski*, 130 S. Ct. at 3223-24.

²² Method of Making Alcohol, U.S. Patent No. 1,759,122 col.2, ll.82-89 (filed Jan. 26, 1924) (“[W]hat is claimed is: 1. The continuous method of making alcohol which consists in mixing molasses and water to form unfermented wort, producing alcohol therein by fermenting the wort, distilling the fermented wort to obtain alcohol . . .”).

²³ *Bilski*, 130 S. Ct. at 3233 (Stevens, J., concurring).

it in conjunction with other patentability criteria.²⁴ The proper question is whether Bilski's claim was *practically* useful. Practical usefulness requires that the claim provide some specific public benefit—that it *do something*. The alcohol patent exhibits such usefulness: ingredients serve as an input, and alcohol results. Bilski's claimed method did not do anything that might provide a specific benefit. It was so broadly worded that there was no specific input, no specific transaction, and no specific output.²⁵ In fact, any series of transactions would provide the result the claim required, and the claim was not limited to any specific type of transaction.²⁶ As the Court described, it was merely the “concept” of hedging.²⁷ A claim that is everything to everyone lacks any specific practical use. In essence, it is *too* useful to be an invention any one inventor could claim.

Usefulness doctrine yields the same outcome as the Supreme Court's ruling with respect to Bilski's broad first claim. However, when considering Bilski's narrower remaining claims, usefulness provides a more reasoned approach to patentability than the Court's unprincipled non-abstractness requirement.²⁸ The Supreme Court, however, did not analyze these narrow claims to any meaningful degree, instead holding them unpatentably abstract along with the broad claim.²⁹

In fact, several of Bilski's narrower claims included important limitations related to pricing, types of commodities, types of data gathered, or

²⁴ See generally Michael Risch, *Everything is Patentable*, 75 TENN. L. REV. 591 (2008) (arguing that rigorous application of traditional patentability requirements are preferable to nonstatutory patentable subject-matter restrictions).

²⁵ Brief for Oregon as Amicus Curiae in Support of Neither Party at 12, *Bilski v. Doll*, 129 S. Ct. 2735 (2009) (No. 08-964), 2009 WL 2247133, at *12 (“There is no manifestly useful outcome, no palpable product, no given result. It is not clear how the process is performed, what the tangible outcome is, or even who benefits.”), *decided sub nom.* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

²⁶ Mark A. Lemley et al., Brief of 20 Law and Business Professors as Amici Curiae in Support of Neither Party at 31, *Bilski v. Doll*, 129 S. Ct. 2735 (2009) (No. 08-964), 2009 WL 2445755, at *31 (“Importantly, the claim is not for a practical application of hedging; rather, it is so broadly enumerated as to be a general principle that is non-enabled.”), *decided sub nom.* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); see also *In re Fisher*, 421 F.3d 1365, 1374 (Fed. Cir. 2005) (explaining that DNA fragments lack practical utility where any fragment from any DNA would serve the same purpose, as “[n]othing about Fisher's seven alleged uses set the five claimed ESTs apart from . . . any EST derived from any organism.”).

²⁷ *Bilski*, 130 S. Ct. at 3229 (majority opinion); see also Risch, *supra* note 24, at 598-611 (discussing how Supreme Court subject-matter jurisprudence is driven by underlying concerns relating to other patentability criteria); Michael Risch, *Forward to the Past*, in CATO SUPREME COURT REVIEW 2009-2010, at 333, 364 (2010) (describing how the *Bilski* Court used practical utility and obviousness criteria).

²⁸ This is not to say there is no principled way to determine whether a claim is an abstract idea. For one such approach, see Mark A. Lemley et al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1337-46 (2011) (discussing how abstract ideas can be used as a scope limitation for when a patent claim reaches too broadly).

²⁹ *Bilski*, 130 S. Ct. at 3231.

specific data processing.³⁰ Such claims provided details about the information to be collected, how commodity prices should be calculated, and when transactions should take place.³¹

Thus, *Bilski*'s more detailed claims might well be practically useful because they provide a specific benefit to the interested public, assuming the claims still met other patentability requirements.³² The Court should have considered the practical utility of the narrower claims rather than rejecting them with no analysis as it did. Going forward, as courts and the Patent and Trademark Office ("PTO") struggle to determine which business methods might be patentable, they can incorporate usefulness in their analyses, either instead of or as part of the definition of abstractness.

Bilski is just one example of how usefulness might assist courts in optimally applying patent law; this Article's six Parts explore several ways usefulness might be relevant. Part I begins by explaining why usefulness should apply to unrelated patent doctrines, then describes three categories of usefulness: operable, practical, and commercial.

The remaining Parts apply these three usefulness concepts, showing how their quantity and timing can play a role in patent policy beyond determining eligible utility. Part II discusses the critical link between the usefulness and novelty requirements, emphasizing the need for an invention to be not only useful, but useful in a new way. Part III shows how usefulness can assist with patentable subject-matter questions like the abstractness problem presented in *Bilski* and issues surrounding laws of nature, natural products, and so-called "ordered information" like books. Part IV examines the interaction between usefulness and obviousness, concluding that inventions that are unexpectedly useful are more likely nonobvious.

Part V shows how usefulness impacts enablement requirements, which consider whether the inventor has provided instructions about how to make and use the invention; Part V then considers how usefulness can be used to determine whether broad, pioneering claims are valid. Part VI addresses how usefulness should be incorporated into the reformed patent statute that awards patents on a first-inventor-to-file basis.³³

I. UNDERSTANDING A PATENT'S USEFULNESS

This Part discusses three ways that an invention might be useful, as well as the implications of measurement and timing of usefulness.

³⁰ *Id.* at 3223-24.

³¹ *Id.*

³² The claims are likely obvious and thus unpatentable. 35 U.S.C. § 103 (2006). Whether the *Bilski* application met the requirements of Section 103 is a separate question and is not discussed in this Article.

³³ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

First, inventions might be *operable*: current eligible-utility doctrine requires that inventions achieve their disclosed purpose. Second, inventions might be *practically useful*: utility rules now require a specific, substantial, and immediate benefit to the public. Third, inventions might be *commercially useful*: while an invention must promise some public benefit, current rules do not require any commercial utility, such as an inventor's readiness to distribute the patented product or proof that someone might actually want to buy the product.³⁴

A. *Why Usefulness?*

Two preliminary questions are why usefulness should be an appropriate policy lever, and why the three types of usefulness discussed below should be the appropriate level of abstraction. To be sure, usefulness is not the only doctrine that arises in many different patent questions. Novelty, for example, plays an overarching role. Indeed, in many respects, novelty is an easier test to apply than usefulness, because the question of newness has a clear answer, given enough information; either something existed in the past, or it did not.

Although utility is a weak patent eligibility gatekeeper, usefulness has pervaded U.S. patent law from its inception.³⁵ The Intellectual Property Clause of the Constitution grants Congress the right to make such laws to promote the progress of the “useful [a]rts.”³⁶ From the very first patent statute and continuing to the present one, any patented invention must be “new and useful.”³⁷ Statutory and case law have shown, implicitly at least, that usefulness is important. For example, patent descriptions must enable one to “make and use” the invention.³⁸ Early obviousness cases tied obviousness to usefulness.³⁹ Further, the now-rejected “useful, concrete and tangible”

³⁴ Michael Risch, *Reinventing Usefulness*, 2010 BYU L. REV. 1195, 1204-05 (2010).

³⁵ Edward C. Walterscheid, *To Promote the Progress of Science and Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution*, 2 J. INTELL. PROP. L. 1, 52-53 (1994) (arguing that utility originated with U.S. law rather than British law, as ideas of utility were discussed extensively during the nation's founding and eventually became part of the Intellectual Property Clause of the Constitution).

³⁶ U.S. CONST. art. I, § 8, cl. 8; *see also* Walterscheid, *supra* note 35, at 52 (“One may also plausibly determine the origin of the phrase ‘useful arts.’ In 1787 ‘useful arts’ meant helpful or valuable trades. Therefore, to promote the progress of useful arts presupposed an intent to advance or forward the course or procession of such trades.”).

³⁷ 35 U.S.C. § 101; Patent Act of 1790, ch. 7, § 1, 1 Stat. 109-10 (1790) (repealed 1793).

³⁸ 35 U.S.C. § 112.

³⁹ *Reckendorfer v. Faber*, 92 U.S. 347, 351 (1876) (discussing invention as tied to decisions about whether the invention is “sufficiently useful and important”).

test explicitly tied patentable subject matter to usefulness.⁴⁰ Whether or not courts have intended to analyze usefulness, it has always been an important consideration that permeates patent law. It is not unreasonable, therefore, to expect that close policy questions might be swayed by an invention's usefulness in the same way that they might be swayed by its newness.

This does not mean that usefulness should necessarily replace the primary inquiries set forth in statute and case law—though this Article argues that in some areas, such as patentable subject matter, it should.⁴¹ Rather, it means that when the doctrine is unclear, contradictory, or unexplained, usefulness can help provide clarity, resolution, and explanation.

Usefulness is also a better level of abstraction than a more generalized social-welfare inquiry. Many issues cannot be resolved by simple appeal to the social good, because that goal is too general and progress toward it is too unmeasurable to provide any practical aid to decisionmakers. That said, usefulness describes one type of social good provided by a patent. An invention's usefulness indicates social welfare; when an invention is useless, society reaps no benefit. It is no surprise that economists call measurements of social welfare “utility.”⁴²

Thus, studying usefulness is a valuable endeavor, even if eligibility utility has historically been a toothless doctrine. As discussed further below,⁴³ one of the benefits of distinguishing usefulness from utility is that courts may consider just how useful a claimed invention is in resolving patentability questions—usefulness is a way to measure one type of social good. Such measurement is (and should be) inappropriate for eligibility utility, but it might be quite helpful for deciding other close questions.⁴⁴

Even if courts do decide that usefulness is important, it may be difficult to measure; however, difficulty in the inquiry does not mean the effort should be abandoned.⁴⁵ For this reason, it is of little moment that measuring usefulness may sometimes be no more concrete than the doctrine it seeks to

⁴⁰ *Bilski v. Kappos*, 130 S. Ct. 3218, 3259 (2010) (Breyer, J., concurring) (quoting *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998)) (internal quotation marks omitted).

⁴¹ *But see* Linda J. Demaine & Aaron Xavier Fellmeth, *Reinventing the Double Helix: A Novel and Nonobvious Reconceptualization of the Biotechnology Patent*, 55 STAN. L. REV. 303, 351-52 (2002) (criticizing the use of utility to determine patentability of natural extracts); Allen K. Yu, *Why It Might Be Time To Eliminate Genomic Patents, Together With the Natural Extracts Doctrine Supporting Such Patents*, 47 IDEA 659, 679 n.96, 702 (2007) (arguing that *Parke-Davis* improperly mixed utility and patentable subject matter).

⁴² Risch, *supra* note 34, at 1198 (internal quotation marks omitted).

⁴³ *See infra* Part V.

⁴⁴ Risch, *supra* note 34, at 1207 (“[L]imiting patents to those that meet a pre-determined degree of utility would likely be too costly and unworkable.”).

⁴⁵ *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 122 (2d Cir. 1930) (Learned Hand, J.) (“We have to decide how much, and while we are as aware as any one that the line, wherever it is drawn, will seem arbitrary, that is no excuse for not drawing it; it is a question such as courts must answer in nearly all cases.”).

inform. Even when usefulness cannot be precisely measured, considering usefulness provides more information than ignoring it entirely.

The three types of usefulness described here—operable, practical, and commercial—are a reasonable starting point because they are the types of eligible utility that cases have adjudicated and scholarship has studied. Because these forms of usefulness have a history and existing cases illustrate how usefulness can aid decisionmakers, courts can more readily apply concepts that already exist. However, these categories need not be exclusive. Other categories of usefulness, including further subsets of the ones presented here, might also provide insight to courts.

B. *Three Categories of Usefulness*

There are three basic types of usefulness that an invention might exhibit: operability, practicality, and commerciality.⁴⁶ Currently, operability and practicality are required for patent-eligible utility, and commercial utility should be required as well.⁴⁷ Even though the law does not currently require a consideration of commercial use to test the eligibility of a patent claim, commercial usefulness might still be a helpful consideration for answering patentability questions in seemingly unrelated doctrinal areas.

1. Operable Usefulness

Operable usefulness requires that a patented invention must actually achieve some intended result. Modern operable utility eligibility requirements exclude three types of inoperable inventions. First, inventions that violate the laws of nature—the most notorious being perpetual-motion machines⁴⁸—are considered inoperable on their face.

Inventions that could possibly work, but that someone familiar with the subject matter would view as incredible, are considered inoperable absent some evidence to the contrary.⁴⁹ Untested pharmaceuticals often fall into this category; while an uncharacterized drug might not break the laws of physics, a skilled artisan would not believe that it would cure an intracta-

⁴⁶ See Risch, *supra* note 34, at 1200-06 (arguing that the implementation of a commercial-utility standard would promote social welfare).

⁴⁷ *Id.* at 1201, 1248 (arguing that the implementation of a commercial-utility standard would promote social welfare).

⁴⁸ *E.g.*, Newman v. Quigg, 877 F.2d 1575, 1577 (Fed. Cir. 1989); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 706.03(a)(II) (8th ed. rev. 2010) [hereinafter MPEP], available at http://www.uspto.gov/web/offices/pac/mpep/mpep_e8r6_0700.pdf (“A rejection on the ground of lack of utility includes the more specific grounds of inoperativeness, involving perpetual motion.”).

⁴⁹ Rasmusson v. SmithKline Beecham Corp., 413 F.3d 1318, 1323 (Fed. Cir. 2005).

ble disease like AIDS or Alzheimer's disease without seeing solid experimental data supporting its operability.⁵⁰

Finally, inventions that cannot be implemented by following the patent's teachings are considered inoperable.⁵¹ This scenario typically arises where the inventor has left details out of the patent specification or when the claimed invention could not work as the patent's specification describes.⁵² Such material omissions may occur due to either an inadvertent drafting error or the inventor's misunderstanding of the purported invention.⁵³ This category differs from the other two because the skilled artisan might believe that the invention works even if the inventor has not adequately described such a result.⁵⁴

2. Practical Usefulness

The modern practical utility eligibility requirement requires that inventions must have some currently available specific and substantial use to be patentable.⁵⁵ When a patent application merely speculates that an invention might be useful in some general way, rather than pointing out a particular defined utility, the invention lacks specific utility.⁵⁶ An invention that provides no immediate benefit to the public, such as basic research into a new drug's physical properties, would require research to identify a real-world application and, therefore, lacks substantial utility.⁵⁷ Just as products can fail to meet the standard for practical utility, processes that make practically useless products also lack practical utility.⁵⁸

⁵⁰ *Id.* at 1324.

⁵¹ *Process Control Corp. v. Hydrex Corp.*, 190 F.3d 1350, 1359 (Fed. Cir. 1999) (explaining that the claim language leads to "nonsensical conclusion"); *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571 (Fed. Cir. 1992).

⁵² Risch, *supra* note 34, at 1202.

⁵³ *Id.*

⁵⁴ It is unsurprising that this type of operability is closely related to Section 112's enablement requirement, which requires an applicant to disclose how to make an invention. 35 U.S.C. § 112 (2006); *see also Brooktree*, 977 F.2d at 1571 ("In this case the questions of utility and enablement turned on the same disputed facts, and were treated similarly at the trial.").

⁵⁵ *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966). The *Brenner* Court wrote:

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

Id.

⁵⁶ *In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005).

⁵⁷ *Id.* at 1376.

⁵⁸ *Brenner*, 383 U.S. at 535.

Practical utility is also reflected in Section 112, which requires inventors to disclose how to use an invention.⁵⁹ If there is no use for the invention, then as a matter of logic, the inventor cannot comply with Section 112's "how to use" requirement.⁶⁰ This relationship is discussed in detail below.

There are many inventions that are useful as a technical matter, but only for further study; for example, a chemical compound of unknown function is useful for carrying out investigations into what the compound itself does.⁶¹ These inventions are treated as practically useless for patentability purposes, though. Utility jurisprudence denies patents on compositions of matter that have no currently known use, even if a valuable use might be revealed by further experimentation.⁶² The composition only has patent-eligible practical utility after such a use (if it exists) is discovered.

Not all inventions have the potential to be used practically, even if the law permitted an infinite amount of experimentation to identify one such use. Some inventions, like the pet rock, fail to "do anything" no matter how extensively they are studied.⁶³ The pet rock and its ilk will never exhibit practical usefulness.⁶⁴

3. Commercial Usefulness

A third category is the commercial usefulness of the invention.⁶⁵ Currently, a patent may issue even if its benefits do not "supersede all other inventions now in practice,"⁶⁶ and even if it is not commercially useful at all.⁶⁷ This is a laissez-faire approach to commercially viable innovation. Because an invention need not convey a commercial benefit to be patent-

⁵⁹ 35 U.S.C. § 112.

⁶⁰ *In re Fouche*, 439 F.2d 1237, 1243 (C.C.P.A. 1971) ("[I]f such compositions are in fact useless, appellant's specification cannot have taught how to use them.").

⁶¹ See MPEP, *supra* note 48, § 2107 pt. II(B)(i).

⁶² Risch, *supra* note 34, at 1203.

⁶³ See Risch, *supra* note 24, at 634 (emphasis omitted).

⁶⁴ For a more detailed discussion of practical usefulness, see *infra* Part III.

⁶⁵ This Article includes any requirement that an invention have moral or beneficial utility within the commercial-utility category. See Risch, *supra* note 34, at 1204 (explaining that moral or beneficial utility falls within the commercial-utility concept).

⁶⁶ *Bedford v. Hunt*, 3 F. Cas. 37, 37 (C.C.D. Mass. 1817); see also *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1367 (Fed. Cir. 1999).

⁶⁷ *Shaw v. Colwell Lead Co.*, 11 F. 711, 715 (C.C.S.D.N.Y. 1882); *Bell v. Daniels*, 3 F. Cas. 96, 98 (C.C.S.D. Ohio 1858) (invention must be completely worthless to be invalidated on utility grounds); *Lowell v. Lewis*, 15 F. Cas. 1018, 1019 (C.C.D. Mass. 1817) ("But if the invention steers wide of these objections, whether it be more or less useful is a circumstance very material to the interests of the patentee, but of no importance to the public. If it be not extensively useful, it will silently sink into contempt and disregard."); John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 453 (2004) ("Simply put, patent law has no aversion to awarding commercially worthless property rights.").

ble, “commercial usefulness” is a wholly undefined doctrine. Prior scholarship suggests that a commercially useful eligibility threshold might be met if the invention can be manufactured at a cost sufficiently low that a number of buyers will be willing to pay for it.⁶⁸ This Article, however, is not limited to eligible utility, and thus considers commercial usefulness more generally as enhancing consumer demand for the invention or providing some supply-side benefit (such as reduced manufacturing cost).

C. *Usefulness Considerations*

Quantity, category, and timing are all important factors to consider in determining the appropriate role of an invention’s usefulness. This Section starts by distinguishing the requisite degree or amount of usefulness from the type of usefulness. It then addresses the critical timing element—an invention may be useless now, but future technological advances could make the same invention indispensable.

1. Categories and De Minimis Quantities of Usefulness

The *amount* of usefulness associated with an invention is distinct from the *type* of usefulness exhibited by the invention. Varying either the type or the quantity of usefulness considered can affect the outcome when courts apply usefulness to resolve patent policy questions.

As I have argued previously, a claim must exhibit *each type* of utility—operable, practical, and potentially commercial—to be patent eligible.⁶⁹ However, a claim need have only a de minimis amount of each type to be eligible for patenting.⁷⁰ Only claims completely devoid of one of the categories should be ineligible. There are several reasons one might want such a lax eligibility rule, including minimizing administrative costs.

Although the analysis might be complex, distinguishing general usefulness from eligibility utility offers an important benefit: the amount, as well as the type, of usefulness may now be considered. While eligible-utility determinations should not be based on the quantity of utility a claimed invention has, other doctrinal questions might be answered by considering just how useful an invention is.

Depending on one’s perspective, the usefulness analysis can be tweaked to support policy goals.⁷¹ The amount and type can be modulated according to a policymaker’s individual normative preferences regarding

⁶⁸ Risch, *supra* note 34, at 1243-44.

⁶⁹ *Id.* at 1198.

⁷⁰ *Id.* at 1206.

⁷¹ *Id.* at 1222.

the doctrinal question at issue. For example, those who favor early patenting would require less commercial usefulness than those who favor later patenting. Similarly, those who favor patenting of new therapeutics would argue for lower levels of operable usefulness.

2. When Usefulness Should Be Measured

A new product or process without utility is not yet an invention. Inventors can apply for a patent without actually building the invention, but before they can file, they must identify some use for the invention to satisfy Section 101's requirement to show some *de minimis* eligibility utility.⁷² Without a defined use, the law does not consider the invention to be "reduced to practice."⁷³ Thus, without a use in the application or clearly inferable from the contemporaneous art, an invention is unpatentable, even if one has filed a patent application.⁷⁴

Furthermore, *each separate claim* must exhibit eligible utility if it is to be considered reduced to practice.⁷⁵ It may be that a few embodiments described in a patent application are useful, while the broader concepts envisioned by the patent might lack one of the categories of utility. Indeed, a claim may be so broad that it covers primarily embodiments that are inoperable at the time of filing.

For example, in *Consolidated Electric Light Co. v. McKeesport Light Co.* (commonly referred to as *The Incandescent Lamp Patent*),⁷⁶ the Supreme Court considered a patent whose claims encompassed *all* possible fibrous filaments in light bulbs.⁷⁷ In *Incandescent Lamp*, the patent holders had shown that a few filaments worked in light bulbs, but they had not investigated the vast majority of the filaments their claims embraced.⁷⁸ In fact, at the time the patent application was filed, most filaments were inoperable, and the carbonized filament made from rare Amazon bamboo that

⁷² *Bogoslowsky v. Huse*, 142 F.2d 75, 76-77 (C.C.P.A. 1944) (stating no actual reduction to practice until operable utility is tested). *But see* S. Wolffe, *Adequacy of Disclosure as Regards Specific Embodiment and Use of Invention*, 41 J. PAT. OFF. SOC'Y 61, 65 (1959) (explaining that practical use requirement might unfairly require chemical inventors to actually reduce inventions to practice); Stanley H. Cohen & Charles H. Schwartz, Note, *Do Chemical Intermediates Have Patentable Utility?*, 29 GEO. WASH. L. REV. 87, 106 (1960) (explaining that chemical must be produced and utility shown to be reduced to practice).

⁷³ Risch, *supra* note 34, at 1211 n.66; *see also* Cohen & Schwartz, *supra* note 72, at 106.

⁷⁴ *See Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 66 (1998) (arguing that an invention is not eligible for patenting until it is reduced to practice); *see, e.g., In re Ziegler*, 992 F.2d 1197, 1198, 1203 (Fed. Cir. 1993) (holding that polypropylene, one of the most important inventions of the twentieth century, was not useful at the time of the 1954 patent filing).

⁷⁵ *See* Risch, *supra* note 34, at 1211-12.

⁷⁶ 159 U.S. 465 (1895).

⁷⁷ *Id.* at 468.

⁷⁸ *Id.* at 472.

the accused infringer—Thomas Edison—found to be extremely successful had been identified only after “the most careful and painstaking experimentation.”⁷⁹ The *Incandescent Lamp* Court held that while the claim language included Edison’s carbonized bamboo, rewarding the patent holders for Edison’s success would be a nonsensical result.⁸⁰ However, the Court held a separate claim for a light bulb containing carbonized paper—a *particular type* of fiber—operable and, therefore, valid.⁸¹

Timing thus refers to when the usefulness of *each claim* is discovered. Some discoveries will never be useful, while others are simply not yet useful at the time they are discovered.⁸² Distinguishing never-useful from not-yet-useful claims can have an important impact on usefulness outside of eligible-utility questions.⁸³ Most utility jurisprudence and scholarship relate to practical utility in the “unpredictable arts,” such as chemical and biological compounds, because observers expect that someone will discover utilities for these inventions in the future.⁸⁴ The primary concern in such cases is granting a patent too early, thereby removing others’ incentive—and ability—to identify those utilities and potentially depriving the public of any useful benefit.⁸⁵

But the rulings and dicta from not-yet-useful unpredictable arts cases might not apply to never-useful inventions in the “predictable arts,” such as mechanical devices, or “abstract arts,” such as books and algorithms. Inventions in the predictable and abstract arts (and unpredictable arts, for that matter) may never have patent-eligible utility, no matter how diligent the search for one.⁸⁶ Because of the law’s focus on as-yet-undiscovered uses for new products,⁸⁷ jurisprudence relating to never-useful inventions is underdeveloped. Instead, courts have developed ineffective proxies—such as patentable-subject-matter restrictions—to consider the patentability of this sort of invention.⁸⁸ While the predictability of the art in question clearly

⁷⁹ *Id.* at 470-75.

⁸⁰ *Id.* at 471-72, 476 (“[T]he fact that paper happens to belong to the fibrous kingdom did not invest [the patent holders] with sovereignty over this entire kingdom, and thereby practically limit other experimenters to the domain of minerals.”).

⁸¹ *Id.* at 468, 472, 477.

⁸² Risch, *supra* note 34, at 1213.

⁸³ *Id.* at 1214-15.

⁸⁴ See J. Timothy Meigs, *Biotechnology Patent Prosecution in View of PTO’s Utility Examination Guidelines*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 451, 455-58, 474 (2001).

⁸⁵ Risch, *supra* note 34, at 1229.

⁸⁶ See *infra* Part III (discussing practical utility in abstract inventions).

⁸⁷ *Potter v. Tone*, 36 App. D.C. 181, 185 (D.C. Cir. 1911) (“The issues in this interference do not cover the use of the material in question for any specific purpose, but the production of a novel material of described characteristics, which characteristics may suggest many uses to subsequent inventors.”).

⁸⁸ Kristin Osenga, *Ants, Elephants Guns, and Statutory Subject Matter*, 39 ARIZ. ST. L.J. 1087, 1091-92 (2007); Risch, *supra* note 24, at 598.

impacts the analysis, this Article considers these timing issues and how they affect usefulness generally.

II. USEFULNESS AND NOVELTY

This Part explores the interplay between usefulness and novelty. These two requirements are symbiotic; complete understanding of one requires an understanding of other.⁸⁹ An invention may look different than its predecessors—perhaps a different size or shape—but without new or different usefulness, it cannot be considered novel.⁹⁰ Given Section 101’s baseline requirement that inventions be “new and useful,” exploring the usefulness/novelty nexus is critical.

Any invention is useful for *something*. A purported perpetual-motion machine might be useful as a doorstop, an unknown chemical may be useful as filler in cat litter, and algorithms written on the wall might be a useful decoration. Nevertheless, these inventions are not patentable because they do not exhibit the type of usefulness contemplated by the patent laws: the proposed uses have nothing to do with what separates the invention from the prior art.⁹¹ A perpetual-motion machine is useful when it operates without losing energy, not when its mass holds a door open. Chemicals are useful when they react to give some particular effect or benefit. An algorithm in computer software is useful for providing output.

The PTO’s Utility Guidelines call utility unrelated to novelty “throw-away” utility,⁹² but this term simplifies the novelty/usefulness link. Indeed, the novelty/usefulness nexus underscores the Guidelines’ requirement that

⁸⁹ *Gandy v. Main Belting Co.*, 143 U.S. 587, 593 (1892) (“The questions of novelty and utility may properly be considered together.”); see Risch, *supra* note 24, at 602 n.74 (discussing how “new” is under-emphasized in the phrase “new and useful”). See generally GEORGE TICKNOR CURTIS, A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS IN THE UNITED STATES OF AMERICA 3-55 (Charles C. Little & James Brown eds., 1849) (novelty and utility discussed together in a single chapter).

⁹⁰ Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 280 (1977) (explaining that change of color or shape does not make an invention novel).

⁹¹ *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 548-49 (1871) (“Improvements for which a patent may be granted must be new and useful . . . the requirement of the patent act in that respect is satisfied if . . . the machine is capable of being beneficially used for the purpose for which it was designed . . .”); Michelle L. Johnson, Comment, *In re Brana and the Utility Examination Guidelines: A Light At the End of the Tunnel?*, 49 RUTGERS L. REV. 285, 287, 300 (1996) (explaining that usefulness in *Brana* was based on being better than the prior art).

⁹² MPEP, *supra* note 48, § 2107 pt. II(B)(1)(i) (internal quotation marks omitted); Stephen G. Kunin, *Written Description Guidelines and Utility Guidelines*, 82 J. PAT. & TRADEMARK OFF. SOC’Y 77, 98-99 (2000).

applicants show “specific” utility⁹³—specific utility is the utility conferred by the invention’s novelty.⁹⁴

An invention can have novelty without usefulness, but it cannot have patentable usefulness without novelty. Of course, a claimed invention might still be useful even if it is not new, but it is not “new *and* useful.”⁹⁵ For example, a differently shaped hammer drives nails, even though hammers have existed—and have driven nails—for twenty-five hundred years.⁹⁶ However, a claim to the differently shaped hammer will be patentable only if the hammer’s novel shape provides some new or different useful benefit in driving nails (or doing whatever else the hammer was designed to do; for example, sledge, war, and claw hammers have specialized functions).⁹⁷ A new hammer’s patentable usefulness must be based on its ability to drive nails⁹⁸ and not on its ornamental shape⁹⁹ or door-stopping capabilities.

The Patent Act implicitly recognizes the link between novelty and usefulness: inventors who discover new uses for old inventions are entitled to patents for that new method of use.¹⁰⁰ For example, a method of treating kidney stones and osteoporosis with a chemical compound that was previously used only in the laboratory to stabilize solutions might be patentable.¹⁰¹ In such patents, novelty and use are one and the same.

The link between novelty and usefulness provides fundamental insight into defining exactly what the invention is and whether prior knowledge

⁹³ MPEP, *supra* note 48, § 2107 pt. II(B)(1)(i).

⁹⁴ See Kunin, *supra* note 92, at 97 (“With regard to the issue of specific utility, the question to ask is whether or not a utility set forth in the specification is *particular* to the claimed invention.”).

⁹⁵ 35 U.S.C. § 101 (2006) (emphasis added); *In re Holmes*, 63 F.2d 642, 643 (C.C.P.A. 1933) (holding that a claimed-pipe construction method does not have any utility because a pipe manufactured with the claimed method does not provide any advantage over pipes known to the prior art, “[t]he fact is that the pipe so constructed may be useful, but there may be no utility in the particular form of the structure which appellant claims is invention”).

⁹⁶ SANDOR NAGYSZALANCZY, *THE ART OF FINE TOOLS* 68-71 (2000).

⁹⁷ Cf. *In re Merz*, 97 F.2d 599, 601 (C.C.P.A. 1938) (“[I]f the process produces an article of such purity that it differs not only in degree but in kind [from pre-existing materials] it may be patentable. If it differs in kind, it may have a new utility in which invention may rest.”).

⁹⁸ 1 WILLIAM C. ROBINSON, *THE LAW OF PATENTS FOR USEFUL INVENTIONS* § 344 (1890) (“The utility of an invention is often properly considered by the courts in their investigation of two different topics, with which otherwise it has no connection. . . . Second, upon the question of novelty, where doubt arises concerning the identity of two inventions, and whether the apparent diversities between them are formal or substantial, the superior utility of one may be sufficient to remove the doubt.”).

⁹⁹ Kitch, *supra* note 90, at 280 (explaining that changing color does not confer novelty); see also U.S. Patent Application Serial No. 0074605 A1, at *1 ¶¶ [0004]-[0005] (filed Oct. 2, 2006).

¹⁰⁰ 35 U.S.C. § 100(b); see also *In re Hack*, 245 F.2d 246, 248 (C.C.P.A. 1957). Thus, patentees have an incentive to disclose the best uses for the invention so that others cannot claim those uses in new patents. Nathan Machin, Comment, *Prospective Utility: A New Interpretation of the Utility Requirement of Section 101 of the Patent Act*, 87 CALIF. L. REV. 421, 434 (1999).

¹⁰¹ E.g., *Merck & Co. v. Teva Pharms. USA, Inc.*, 347 F.3d 1367, 1372 (Fed. Cir. 2003); U.S. Patent No. 4,621,077 col.1, ll.10-14 (filed June 8, 1984).

renders it unpatentable.¹⁰² Determining whether an invention is really new is difficult when a claim is broad and generalized, but the patent specification discloses only a few particular embodiments within the claim's scope. The non-novel aspects of broad claims outnumber the novel ones because more teachings are related to broad claims and are available as prior art.¹⁰³ However, even a broad claim can be novel if it has some new use associated with it, despite the many prior-art references that might generally relate to the claim's content.

This insight is important because people often think that every broad claim has been invented before. The *Bilski* claims illustrate the point. *Bilski* claimed broad and generalized steps related to hedging; the Supreme Court simply noted that those steps had long been known and ended its analysis there.¹⁰⁴ However, some of the claims included slightly more specific data gathering and price calculation steps.¹⁰⁵ These steps, though still broad and general, might have given the claims a new commercial usefulness not seen in prior hedging literature. If that were the case, those narrow claims were likely novel.

The novelty/usefulness link also applies to claim construction—identifying exactly what the claimed invention is. An invention is defined in part by the benefits it purports to provide—whether based on operability, practical benefit, or commercial considerations. Indeed, courts have held that a claim interpretation that excludes the preferred embodiment of the claimed invention is likely wrong.¹⁰⁶ Courts construing claims can and should consider the proffered use to determine how the public should understand the patent's scope.

¹⁰² *Eagle Mfg. Co. v. Bradley*, 35 F. 295, 296 (C.C.S.D. Iowa 1888) (explaining that the Dalton agricultural cultivator did not invalidate the Wright cultivator because the Wright cultivator had novelty, and “[a]s applied to cultivators, a Dalton combination would have no practical value, whereas that of Wright is useful and valuable when thus applied”).

¹⁰³ See *infra* Part V (discussing how usefulness might be used to determine whether a patent disclosure enables one to make and use inventions with a broad claim scope).

¹⁰⁴ *Bilski v. Kappos*, 130 S. Ct. 3218, 3231 (2010).

¹⁰⁵ *Id.* at 3224.

¹⁰⁶ *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (“Such an interpretation [that excludes the preferred embodiment] is rarely, if ever, correct and would require highly persuasive evidentiary support . . .”). *But see* *Tol-O-Matic, Inc. v. Proma Produkt-Und Mktg. Gesellschaft*, 945 F.2d 1546, 1553 (Fed. Cir. 1991) (“Accepting that the jury must have found that the device did not work as Proma had argued in distinguishing the prior art, this is not an issue of lack of utility. . . . It is not required that a particular characteristic set forth in the prosecution history be achieved in order to satisfy §101.”), *overruled on other grounds by* *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995). Of course, if the claim language unambiguously excludes such an interpretation, then that interpretation may be proper.

III. USEFULNESS AND PATENTABLE SUBJECT MATTER

Though it is not explicitly used as such now, usefulness should be a critical policy lever with respect to patentable subject matter. As the *Bilski* case demonstrates, a problem with limiting the type of subject matter eligible for patenting is that it can be extremely difficult to determine whether a claimed invention covers an abstract idea, natural product, law of nature, or other unpatentable subject matter, such as books, art, or music.¹⁰⁷ As thoroughly discussed in a prior Article, many subject-matter opinions can be better explained as judicial concern with lack of practical use.¹⁰⁸ Measuring usefulness—almost exclusively practical usefulness—could help resolve questions about whether to allow patenting of controversial subject matter and avoid metaphysical debates about when an invention crosses into some ill-defined category like “abstract idea.”

This Part applies the usefulness doctrine to abstract ideas, showing how it can help determine whether a process is an unpatentable algorithm or a patentable application of the algorithm. The Part then discusses usefulness in conjunction with laws of nature and demonstrates that the patentability of a product derived from nature turns on whether the derived product provides usefulness that was not available in natural form. This Part concludes by discussing usefulness as it applies to “ordered information” such as books and music.

A. *Usefulness of Abstract Ideas*

Practical use analysis can help answer whether a seemingly intangible process is patentable or not. *Bilski* is merely the latest in a line of cases considering this question. For example, in *Gottschalk v. Benson*,¹⁰⁹ the Court disallowed a computerized method whose purpose was to simply convert numbers from one format to another.¹¹⁰ Interpreting *Gottschalk* on subject-matter grounds has caused much confusion.¹¹¹ Indeed, the opinion can be better explained by usefulness.

The *Gottschalk* method did not *do* anything—it was an isolated series of calculations without any inputs or outputs that directly applied to a real-

¹⁰⁷ See Risch, *supra* note 24, at 593 (describing the difficulty of finding a clear definition for patent-eligible subject matter).

¹⁰⁸ *Id.* at 598, 602-06.

¹⁰⁹ 409 U.S. 63 (1972).

¹¹⁰ *Id.* at 67, 71-72.

¹¹¹ Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305, 322 (1992); Peter S. Menell, *Forty Years of Wondering in the Wilderness and No Closer to the Promised Land: Bilski's Superficial Textualism and the Missed Opportunity to Return Patent Law to Its Technology Mooring*, 63 STAN. L. REV. 1289, 1290-91, 1297-98 (2011); Risch, *supra* note 24, at 650.

world problem.¹¹² Thus, it had no practical use because the process, standing alone, did not provide a specific or substantial benefit to the public.¹¹³ To be certain, it could have been incorporated into practically useful applications, but calculations that can be used everywhere, including simply for calculation's sake, lack practical usefulness.¹¹⁴

Similarly, a process to calculate the result of Einstein's famous $E=mc^2$ lacks practical use,¹¹⁵ while a nuclear reactor operating along that principle has a practical use. In other words, processes based on physical laws may be useful when they are applied to solve some practical problem.¹¹⁶ In general, though, a series of steps that achieves no particular end is not practically useful and is, therefore, unpatentable.

Here, usefulness and eligible utility overlap somewhat. The cleanest test would replace the current patentable-subject-matter test altogether with eligibility utility.¹¹⁷ As an alternative, and perhaps a more realistic one given the fact that the *Bilski* Court did not discard the existing test, usefulness should be used as a factor to give meaning to what is an "abstract idea."

The Federal Circuit started down this path in *State Street Bank & Trust Co. v. Signature Financial Group*,¹¹⁸ in which it ruled that processes leading to "useful, concrete, and tangible results" are patentable subject matter.¹¹⁹ *State Street's* appeal to usefulness has been criticized in two important ways (among others). First, those who prefer to limit patentable subject matter criticize the rule's result: business methods are considered patentable subject matter.¹²⁰ This Article disagrees that business methods should be categorically excluded and, thus, provides no answer to this criticism. Those who dislike the *State Street* formulation will surely disagree with the rule proposed here.

But there is a second criticism of the "useful, concrete, and tangible" test that applies to this Article's analysis: the test is too general because it

¹¹² *Gottschalk*, 409 U.S. at 65-67.

¹¹³ *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966).

¹¹⁴ Cf. Lemley et al., *supra* note 28, at 1337-38 (positing that generic claims are more likely to be abstract).

¹¹⁵ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) ("Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity.").

¹¹⁶ E.g., *Diamond v. Diehr*, 450 U.S. 175, 184-85, 187-88 (1981); *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939).

¹¹⁷ Risch, *supra* note 24, at 591 (arguing that there is no need to consider whether an invention is patentable subject matter if it otherwise meets the Patent Act's requirements of category of invention, utility, novelty, nonobviousness, and specification).

¹¹⁸ 149 F.3d 1368 (Fed. Cir. 1998), *abrogated by Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

¹¹⁹ *Id.* at 1375 (quoting *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994)) (internal quotation marks omitted).

¹²⁰ E.g., Malla Pollack, *The Multiple Unconstitutionality of Business Method Patents: Common Sense, Congressional Consideration, and Constitutional History*, 28 RUTGERS COMPUTER & TECH. L.J. 61, 66-67 (2002).

does not consider all three categories of usefulness.¹²¹ An uncategorized “usefulness” requirement can be met by many claims that are not practically useful; for example, the laws of relativity and gravity are certainly useful in that they govern the universe; on their own, though, they are not practically useful. The “concreteness” element of the *State Street* test brings the analysis closer to considering practical usefulness, but the “tangibility” requirement goes too far because it might exclude practically useful processes that are intangible.¹²²

Bilski’s claims illustrate the point. As discussed in the Introduction, Bilski’s claims would have been better analyzed—and lower courts can better identify impermissible abstractness—by looking to the practical use of the claim. Bilski’s first claim (the broadest one) was not practically useful because it does not provide any substantial or specific benefit to the public, as required by practical usefulness.¹²³ In other words, the process claimed did not *do* anything—the claim did not require any specific inputs, any specific activity, or any specific output that could be used for some specific public benefit—whether tangible or intangible. In that sense, Bilski’s claim was even more abstract than the calculation method in *Gottschalk*, which included transformative mathematical steps to reach a desired result, though the calculated result in that case had no specific benefit either.

Some *Bilski* amici were concerned about the usefulness of the broad claim in that case. As one brief argued: “There is no manifestly useful outcome, no palpable product, no given result. It is not clear how the process is performed, what the tangible outcome is, or even who benefits.”¹²⁴ Another brief made a similar point: “Importantly, the claim is not for a practical application of hedging; rather, it is so broadly enumerated as to be a general principle that is non-enabled.”¹²⁵ As the Court described, it is merely the “concept of hedging.”¹²⁶

¹²¹ See, e.g., Stephen McJohn, *Scary Patents*, 7 NW. J. TECH. & INTELL. PROP. 343, 352 (2008) (describing how the *State Street* test led to patents on processes that resulted merely in manipulated numbers and were not practically useful). See generally Supplemental Letter Brief of Appellee at 12, *In re Comiskey*, 554 F.3d 967 (Fed. Cir. 2009) (en banc) (No. 2006-1286), 2007 WL 869875 (arguing against allowing a business-method patent that claimed to result in a binding arbitration decision because the process might be inoperable in certain circumstances).

¹²² Further, tangibility is difficult to define. There is great disagreement, for example, about processes relating to monetary transactions. Surely money is tangible, though the calculations are no more tangible than any other method for calculating numbers. See Robert A. McFarlane & Robert G. Litts, *Business Methods and Patentable Subject Matter Following In re Bilski: Is “Anything Under the Sun Made By Man” Really Patentable?*, 26 SANTA CLARA COMPUTER & HIGH TECH. L.J. 35, 47-49 (2010) (discussing the controversy created in the wake of *State Street*).

¹²³ *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966).

¹²⁴ Brief for Oregon as Amicus Curiae in Support of Neither Party, *supra* note 25, at 12.

¹²⁵ Mark A. Lemley et al., Brief of 20 Law and Business Professors as Amici Curiae in Support of Neither Party, *supra* note 26, at 31.

¹²⁶ *Bilski v. Kappos*, 130 S. Ct. 3218, 3222 (2010).

Further, precedent requires that when an invention's practical use is difficult to discern, the specific benefit must be related to the invention's novelty.¹²⁷ In *Bilski*, however, just about any series of transactions would have satisfied the broad claim to provide a "hedging" benefit. The broad claim was barely novel, and its language included no specific transactions that provided any practical benefit tied to that nearly indiscernible novelty. This is similar to the numeric conversion method claimed in *Gottschalk*: while the claim might have been useful when applied a certain way, on its own it proves too much—a claim that is everything to everyone is not practically useful for any specific benefit.¹²⁸

State Street's "useful, concrete, and tangible" test does not necessarily yield the same result for *Bilski*'s claim as the practical usefulness test would. After all, *Bilski* argued that his claim satisfied the *State Street* test,¹²⁹ and it may well have. However, the practical usefulness test requires more than nebulous useful potential; it requires that a method have specific uses that *Bilski*'s broad claim simply does not have.

Finally, principled consideration of a claim's usefulness is preferable to an ill-defined "abstract idea" test because *Bilski*'s *other* claims might be useful—as may the tens of thousands of intangible method claims that the PTO and courts need to evaluate—and an undefined test provides no guidance for determining which claims are abstract or for explaining why they are or are not. Some of *Bilski*'s remaining claims might show practical usefulness and thus be patentable if they satisfy the other statutory requirements. As the claims become progressively narrower, including detailed elements about pricing, data gathering, specific commodities, and so forth,¹³⁰ they might provide a very specific and substantial benefit to those who might practice the claimed method. At that point, the claims should not be considered abstract, because they have a practical use. Of course, the claims might still be obvious, but they would not be excluded on the question of patentable subject matter.

¹²⁷ See, e.g., *In re Fisher*, 421 F.3d 1365, 1374 (Fed. Cir. 2005) (finding that the DNA fragments that were the subject of the claim lacked practical utility because any fragment from any DNA would serve the same purpose: "Nothing about Fisher's seven alleged uses set the five claimed ESTs apart from . . . any EST derived from any organism").

¹²⁸ Another way to consider this is that the claim has too much usefulness—the claim scope exceeds that of the patentee's inventive contribution. Lemley et al., *supra* note 28, at 1337-38 (suggesting that courts use abstract ideas exception as a way to rein in overbroad claims).

¹²⁹ Appellants' Supplemental Brief at 3, *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (No. 2007-1130), 2008 WL 822725, *aff'd sub nom.* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

¹³⁰ Joint Appendix at 20-22, *Bilski v. Doll*, 129 S. Ct. 2735 (2009) (No. 08-964), 2009 WL 2373016, *decided sub nom.* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

B. *Laws of Nature*

Abstract ideas are only one area in which usefulness analysis can solve patentable-subject-matter concerns; practical usefulness can also help distinguish whether a “law of nature” is patentable. Basic scientific discoveries (like gravity) are not patentable because, standing alone, they have no practical use that might benefit the public. Gravity is not patentably useful, but there are patents that rely on the force of gravity to achieve some end that might benefit the public.¹³¹ Such patents are practically useful and thus patentable, even though the principles on which they are based are barred as non-useful.

Usefulness is important because *every* patent relies on a law of nature at some point. Determining the dividing line between unpatentable laws and patentable applications can be difficult, but practical use provides helpful guidance for distinguishing patentable claims from those that should be excluded.

C. *Natural Products*

Usefulness also provides a valuable perspective for determining the patentability of natural products. In general, products derived from nature are patentable if they are isolated and purified into a new form.¹³² In addition, new uses of natural compounds might be patentable as process claims.¹³³ A common concern, however, is how to treat previously undiscovered products, whether natural or by-products of known processes.¹³⁴ For example, a wild plant might cure cancer,¹³⁵ or a steam engine might inadvertently yield tallow for making soap.¹³⁶ When novelty is difficult to evaluate, a consideration of usefulness must go hand-in-hand with a novelty

¹³¹ See, e.g., U.S. Patent No. 7,540,260 B2 col.2, ll.32-39 (filed Nov. 6, 2006) (describing a squirrel-proof bird feeder that senses a squirrel’s weight on top of it and responds by closing the holes that would allow the squirrel to access the bird seed inside the feeder).

¹³² *Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 103 (C.C.S.D.N.Y. 1911). Indeed, the question of how much a composition must be isolated from its natural source to be patentable has been a subject of recent debate. *Ass’n for Molecular Pathology v. U.S. Patent & Trademark Office*, No. 2010-1406, 2011 WL 3211513, at *17 (Fed. Cir. Jul. 29, 2011) (“Although isolated DNA must be removed from its native cellular and chromosomal environment, it has also been manipulated chemically so as to produce a molecule that is markedly different from that which exists in the body.”).

¹³³ 35 U.S.C. § 100(b) (2006).

¹³⁴ E.g., *Molecular Pathology*, 2011 WL 3211513, at *15-20 (examining whether isolated DNA molecules are patent-eligible subject matter or merely products of nature).

¹³⁵ E.g., U.S. Patent No. 7,250,180 B2 col.9, ll.49-67 (filed Jan. 7, 2004) (describing an Amazonian plant extract that has activity against prostate cancer).

¹³⁶ *Tilghman v. Proctor*, 102 U.S. 707, 711 (1880).

analysis.¹³⁷ In natural-derivation cases, it is unclear whether the newly discovered properties, such as those of the plant or steam engine's tallow creation, are sufficiently novel to justify a patent on something that nominally appears to be "natural."¹³⁸

In general, inherency is the doctrine that inquires about previously unknown aspects of inventions that already exist; the law asks whether the inventive aspect was inherently present in the natural product or pre-existing process.¹³⁹ The problem is that cases dealing with inherency are confused at best and contradictory at worst.¹⁴⁰ Professors Lemley and Burk suggest answering the complex inherency question by asking whether the public has received the benefits of the prior invention.¹⁴¹ Under such a test, a chemical new to the periodic table would be patentable even if it were previously an unmeasurable by-product of nuclear reactions,¹⁴² because the public could not have enjoyed any useful benefit of the element prior to its detection. However, a patented drug will invalidate a patent claiming the new chemicals that the drug creates in the human body,¹⁴³ because those new chemicals will have already aided society, albeit inadvertently.

While couched in terms of novelty and subject matter, Lemley and Burk's inherency replacement is really a usefulness question that relies on the novelty/usefulness nexus. Under this Article's proposed inherency test, patent validity rests—as it should—on whether the claim provides some new beneficial use to the public. If it does, then the patent is valid, even if the invention *per se* existed in nature in some form.

Based on this connection, usefulness can address normative policy questions about protection of naturally derived products. First, by considering the amount of usefulness a derived product brings in comparison with the raw natural source, courts or the PTO can make it easier or harder for applicants to obtain a patent on natural derivatives. For example, if one person received the benefit of a whole plant, but a purified extract of that plant is highly therapeutic for millions, then a patent might issue. In that case, the inventor would be bringing significant new usefulness to society by purifying the active agent from the plant. On the other hand, if many people had already benefited from the whole plant, then the extract is less

¹³⁷ See *Molecular Pathology*, 2011 WL 3211513, at *19 (“[I]solating genes to provide useful diagnostic tools and medicines is surely what the patent laws are intended to encourage and protect.”).

¹³⁸ *Id.* at *24-26 (Moore, J., concurring in part) (urging that courts have always required products isolated from natural sources to have a new utility relative to that of the source material). *But see id.* at *18 (majority opinion) (holding that the proper inquiry is whether the isolated product has a different chemical structure, nothing more).

¹³⁹ Dan L. Burk & Mark A. Lemley, *Inherency*, 47 WM. & MARY L. REV. 371, 372 (2005).

¹⁴⁰ *Id.* at 376-77 & n.27.

¹⁴¹ *Id.* at 407.

¹⁴² *E.g., In re Seaborg*, 328 F.2d 996, 998-99 (C.C.P.A. 1964); see U.S. Patent No. 3,156,523 col.1, ll.11-13 (filed Aug. 23, 1946) (describing that element 95 is “now known as americium”).

¹⁴³ *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003).

likely to be patentable, because the extract would not provide appreciable new usefulness compared to the whole plant.

Similarly, measuring the by-products of an old manufacturing process should affect whether one may patent that by-product if a better way to create it is discovered. When the by-product is undetectable or unusable, then one should be entitled to a patent on the by-product itself if one finds a better way to make it. If, however, the by-product is already measurable and useful, then a patent should not be allowed on the product, even if an inventor finds a better way to make it, because the improved production method would make no contribution to society.

When considered this way, usefulness can inform policy relating to indigenous peoples. Currently, unpublished knowledge of an invention only bars patenting if that knowledge is in the United States.¹⁴⁴ Thus, inventions that are known and used only in foreign countries might still be considered “new” under U.S. patent law, even using inherency analysis.¹⁴⁵ This rule means that one can bring a long-used traditional remedy from another country to the United States and patent it, to the consternation of many.¹⁴⁶

However, the statute does not limit eligible utility by geography. Thus, if inherency analysis is treated as a usefulness question, then patents derived from indigenous peoples’ knowledge would provide no new use and be unpatentable, no matter which country’s population enjoyed the prior use.

This argument is not without doctrinal problems. The novelty requirement bars inventions “known or used by others in this country.”¹⁴⁷ As such, some might argue that the “use” at issue is novelty based rather than utility. Further, a broad reading of usefulness would mean that any product used in another country could invalidate a U.S. patent, making it an even farther-reaching doctrine than either the current novelty or utility analysis. It is unclear how patent reform will eventually affect indigenous knowledge, though it appears that Congress intended to make prior art as far reaching as the change proposed here would be.

These doctrinal considerations are persuasive, but they are not fatal. A better dividing line between the patentable and the unpatentable would be based on an expanded reading of Section 101, which states that only “one who discovers a new and useful” invention is entitled to a patent.¹⁴⁸ Thus,

¹⁴⁴ 35 U.S.C. § 102(a)-(b) (2006). *But see* Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 286 (2011) (eliminating prior art “known or used by others” but expanding prior art “in public use” intentionally).

¹⁴⁵ *Id.*; Risch, *supra* note 24, at 652.

¹⁴⁶ See Lakshmi Sarma, Comment, *Biopiracy: Twentieth Century Imperialism in the Form of International Agreements*, 13 TEMP. INT’L & COMP. L.J. 107, 107-08 (1999).

¹⁴⁷ 35 U.S.C. § 102(a).

¹⁴⁸ Section 101 is not the only section that could benefit from a broader reading. For example, some commentators have argued that Section 102(f), which bars inventions derived from another,

when one independently invents something already in use in a foreign country, it would be patentable. However, when one learns of the natural product in a foreign country, he or she has not discovered the useful invention, even under a broad reading of Section 102(b).¹⁴⁹

D. *Books, Music, and “Ordered Information”*

A rigorous view of eligible practical utility answers other patentable subject-matter puzzles, such as why books and music are unpatentable. Given that books, paintings, and compact discs are all articles of manufacture, they should theoretically be patentable under the statute if their content is novel and nonobvious.

However, they are not patentable. Quite simply, books and music do not *do* anything that provides a practical benefit—they just provide inert information. If, however, a collection of sounds activates some device,¹⁵⁰ the combination of the sounds would be a practically useful process. This interpretation is consistent with arguments that writing and basic science were not considered “useful arts” at the time of the founding¹⁵¹ and must therefore be excluded from patent protection. Indeed, ordered-information claims have even less practical usefulness than the claims in *Bilski*. A patent on information itself would simply claim the transaction price and nothing more, while *Bilski* at least envisioned actual transactions.

As noted above, using practical usefulness to sort out eligible subject matter relies on the novelty/usefulness nexus. Books, music, and other non-actuating inventions will always have some use that is unrelated to the information they contain. “Throwaway” uses, such as using books as doorstops, are easily distinguishable from uses associated with the new aspects and intended uses of the invention. For example, a book with no new doorstopping abilities is not useful, though a wedge-shaped book might be useful as a dual-purpose device (for door stopping and for reading).

More difficult to classify are uses that appear to relate to the information, such as a method of entertainment comprising the performance of a

should bar such patents as well. See Oskar Liivak, *The Forgotten Originality Requirement: A Constitutional Hurdle for Gene Patents*, 87 J. PAT. & TRADEMARK OFF. SOC’Y 261, 278 (2005).

¹⁴⁹ See 35 U.S.C. § 102(f). Of course, these problems will only apply to patents filed before the new patent law takes effect. Section 102(f) has been removed, and “public use” will apply intentionally.

¹⁵⁰ See *In re Gulack*, 703 F.2d 1381, 1385 (Fed. Cir. 1983) (“Where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability.”).

¹⁵¹ See Sean M. O’Connor, *Using Insights from the History of Science to Redefine Patentable Subject Matter Under the IP Clause of the U.S. Constitution*, 14 NBL ANNUAL IP REPORT, NO. 123, 2008, at 14, available at <http://ssrn.com/abstract=1104899> (noting that “Art” historically considered broad in history of science, but ultimately arguing that “useful” arts should be understood much more narrowly).

particular set of musical notes. Even here, the novelty/usefulness link should bar patenting. While the set of musical notes may be novel, the form of entertainment (playing music) is not. Thus, there is no “new use” associated with an old technology and, thus, no novelty. Only the first person to discover that the performance of music might entertain could have made a novel, useful invention.

Applying eligible practical utility to information patents explains and justifies a long-used rule called the “printed matter” doctrine. The printed matter doctrine precludes patentability of any writing, unless the writing is tied to new functionality of the invention.¹⁵² Thus, source code printouts are not patentable in that form, while computer programs stored in a computer-readable medium might be.¹⁵³

*In re McKee*¹⁵⁴ is illustrative. In that case, the patentee claimed a method of marking meat—for example, by tattooing it.¹⁵⁵ The court affirmed a rejection based on a lack of novelty; apparently, others had already claimed meat-tattooing devices.¹⁵⁶ The court also affirmed the rejection based on a lack of usefulness:

We see nothing more in appellant’s alleged invention than the arrangement of printed matter upon meat. . . . [In a prior case allowing a patent,] the material upon which the printing appeared had a novel form, which form served a new and useful purpose. In the case at bar, the form of the meat is not in any respect made to depend upon the printing arrangement.¹⁵⁷

Courts still rely on *McKee* and the printed matter doctrine today. In 2004, the Federal Circuit ruled that new forms of presenting information may be patented, regardless of the information presented, but new arrangements of information on old forms have no novel usefulness.¹⁵⁸ Thus, a new type of pop-up book might be patentable,¹⁵⁹ but the content in it would not.

¹⁵² *In re Rice*, 132 F.2d 140, 141 (C.C.P.A. 1942); Richard S. Gruner, *Intangible Inventions: Patentable Subject Matter for an Information Age*, 35 LOY. L.A. L. REV. 355, 403-05 & n.231 (2002).

¹⁵³ See *In re Beauregard*, 53 F.3d 1583, 1584 (Fed. Cir. 1995); see also Gruner, *supra* note 152, at 405 (“The rule that has emerged from these judicial analyses is that if the shape or form of printed material or the location of matter printed on it has functional implications in enhancing or limiting the use of the material, then a sufficient functional structure for patenting is present in the printed matter.”).

¹⁵⁴ 64 F.2d 379 (C.C.P.A. 1933).

¹⁵⁵ *Id.* at 379 (“[Claim] 17. The method of marking meat which consists in causing the points of a series of needles to contact successively with an ink supply and thereafter to penetrate successively successive portions of the meat surface and thereby deposit ink at the points of penetration.”).

¹⁵⁶ *Id.* at 379-80.

¹⁵⁷ *Id.* at 380.

¹⁵⁸ *In re Ngai*, 367 F.3d 1336, 1339 (Fed. Cir. 2004) (citing *In re Gulack*, 703 F.2d 1381, 1385 (Fed. Cir. 1983)) (printed matter must have some functional relationship to whatever the information is printed on in order to create a “new” product).

¹⁵⁹ *E.g.*, *Coloring Book with Pop-Up Figures*, U.S. Patent No. 6,050,604 col.1, ll.25-45 (filed Jan. 14, 1999).

This analysis is not limited to books and music; it applies to any information that has value due to its organization—“ordered information.” Like books and music, ordered information must have a practical use.¹⁶⁰ Ordered information includes signals¹⁶¹ that are divorced from any electronic system or storage medium.¹⁶² A signal standing alone is not practically useful because it does not do anything. A method for combining a particular signal with data might be extraordinarily useful, but the signal itself does nothing to provide a specific and substantial benefit.

The application of rigorous practical utility to ordered information is not without complication. Board games, for example, present a thorny problem. People have been patenting “game boards” for some time.¹⁶³ Technically, a game board with no other parts is non-useful printed matter; the game is printed on cardboard (an old medium) and has no new practical usefulness.¹⁶⁴ Only the first-ever board game had novel usefulness for entertainment as a game. All subsequent board games had the same entertainment use as the first one.

However, game-board patent claims typically include additional parts and their interaction with the game board as part of the invention.¹⁶⁵ The claim is to not just the board, but to the combination of the board, the supplemental parts, and their interactive function.¹⁶⁶ Such claims add new prac-

¹⁶⁰ Gruner, *supra* note 152, at 410 (“In sum, the . . . patent case law on printed matter generally suggest that to be patentable an information-processing procedure should achieve an element of practical benefit or utility above and beyond the utility of the input information used in the procedure.”).

¹⁶¹ As used here, a signal is a quantum of information organized in a specific way but separated from any physical medium. *In re Foster*, 438 F.2d 1011, 1016 (C.C.P.A. 1971) (explaining that a signal is “[a] visual, aural, or other indication used to convey information” or “[a]n event or occurrence that transmits information from one location to another”); *see, e.g.*, Sam S. Han, *Analyzing the Patentability of “Intangible” Yet “Physical” Subject Matter*, 3 COLUM. SCI. & TECH. L. REV. 2, at 55 (2002) (“Webster’s dictionary provides that a ‘signal’ is: in radio, etc. the electrical impulses transmitted or received. Although that definition only provides for ‘electrical impulses,’ other types of signals may be encompassed in our analysis (e.g., magnetic impulses, continuous waves, etc.).” (footnote omitted)).

¹⁶² *See, e.g.*, *In re Nuijten*, 500 F.3d 1346, 1351 (Fed. Cir. 2007).

¹⁶³ *See, e.g.*, Board Game Apparatus, U.S. Patent No. 2,026,082 (filed Aug. 31, 1935) (describing the *Monopoly* board game); Game-Board, U.S. Patent No. 748,626 cl.1, 1.9 (filed Mar. 23, 1903) (describing the “The landlord’s game” (internal quotation marks omitted)); Shubha Ghosh, *Patenting Games: Baker v. Selden Revisited*, 11 VAND. J. ENT. & TECH. L. 871, 876 (2009).

¹⁶⁴ *In re Bryan*, 323 F. App’x 898, 901-02 (Fed. Cir. 2009) (per curiam) (board game held obvious because it had the same parts as a prior game, except different labels); *Ex parte Gwinn*, 112 U.S.P.Q. (BNA) 439, 449 (Pat. Off. Bd. App. 1955) (game unpatentable printed matter where only difference between game and prior art is indicia on dice).

¹⁶⁵ Ghosh, *supra* note 163, at 876.

¹⁶⁶ *In re Gulack*, 703 F.2d 1381, 1384, 1386 (Fed. Cir. 1983) (explaining that a hatband with printing is patentable because it interacts with remainder of the invention to perform new use); *Cincinnati Traction Co. v. Pope*, 210 F. 443, 446-47 (6th Cir. 1913) (explaining that a transfer ticket is patentable because the printing is on a new form of paper). *But see In re Ngai*, 367 F.3d 1336, 1339 (Fed. Cir. 2004) (explaining that the mere addition of instructions to a known product does not create a patentable product).

ticality—people use the different parts in a new way for a different purpose (a new game),¹⁶⁷ much the same way they might play a new kind of musical instrument or gambling machine, both of which have eligible practical utility. On the other hand, if a known set of game pieces are claimed—with or without different labels—then the game pieces could not be patented because they are not new. The printed-matter limitation is only on the physical structure; the new game rules might be a new and useful process for using the old game.¹⁶⁸

On a similar note, a book containing rules for how to read it might have patentable use.¹⁶⁹ While the author could not locate a patent covering *Choose Your Own Adventure* books, several applicants have sought patents on electronic versions of such books.¹⁷⁰ This is not to say that all variable-ending stories are patentable; a computer-program version of such a book with rules might be obvious, for example.¹⁷¹ In each of these cases, however, it is the method of using the book or the special construction of the book that is useful, not the book's content.

Usefulness analysis can address whether controversial subject matter should be patented in a way that past rules cannot. Determining the usefulness of a claim can be achieved more easily and in a more principled way than determining what is an abstract idea. This is normatively true, and as shown by the printed matter doctrine, doctrinal rules have incorporated usefulness implicitly.

¹⁶⁷ *Cusano v. Kotler*, 159 F.2d 159, 162 (3d Cir. 1947) (“Because of the cultural and prophylactic importance of games in our social structure, and the additional relevant factor of the huge annual expenditure for recreation we can properly conclude that the creation of a new game conforms to the patent requirement of being useful.” (footnote omitted)).

¹⁶⁸ *Bryan*, 323 F. App'x at 901-02. “While Mr. Bryan asserts that the printed matter is functionally related . . . these types of arguments do not pertain to what he *claims* and seeks to patent—the structure of the game *apparatus*. Rather, these arguments pertain to the patentability of *methods or processes* of playing the game, which are irrelevant to the *apparatus* claims at issue. Indeed, if we were to accept Mr. Bryan's arguments, it seems anyone could patent the structure of a pre-existing game simply by changing the game's theme without changing its structure.” *Id.*; *Ngai*, 367 F.3d at 1338 (“The PTO argues that Ngai's claim merely teaches a new use for an existing product. Thus, according to the PTO, Ngai can claim the new use as a method, but he cannot claim the existing product itself.”).

¹⁶⁹ See, e.g., *Creative Writing Book*, U.S. Patent No. 5,306,155 col.1, ll.5-29 (filed Nov. 24, 1992).

¹⁷⁰ See, e.g., *System and Method for Recombinant Media*, U.S. Patent Application Serial No. 0009485 A1, at [0020]-[0022] (filed June 25, 2002).

¹⁷¹ *Gulack*, 703 F.2d at 1386 (affirming a ruling that a hatband with material printed on it was statutory subject matter as a manufacture, but only patentable if that writing made it novel and nonobvious). The patentability of the “choose-your-own-adventure” software claims is suspect; the author recalls writing a “Where the Red Fern Grows” choose-your-own-adventure story for the Commodore CBM for a 1986 English project.

IV. USEFULNESS AND OBVIOUSNESS

Usefulness should serve as a guide for determining whether an invention makes a sufficient improvement over the prior art to be patentable. The obviousness requirement is captured in Section 103,¹⁷² which denies a patent to any claim that would have been obvious to those with ordinary skill in the art at the time the invention was made. Courts have struggled to define obviousness; the Supreme Court's latest foray into the subject¹⁷³ left the test quite general and the answer often difficult to divine.¹⁷⁴ For example, obviousness analysis under Section 103 uses so-called secondary factors, which are helpful to sway the fact finder's opinion toward one direction or another.¹⁷⁵ Secondary factors include commercial success, long-felt but unmet needs, praise by others, failure of others, prior art that "teaches away" from the invention, recognition of a problem, others' copying of the applicant's invention, and simultaneous invention.¹⁷⁶

However, while secondary-consideration factors have grown more important in the obviousness inquiry,¹⁷⁷ the current doctrinal role of such factors is murky. The Supreme Court recently stated that secondary factors should be applied "where appropriate" and that patent claims to combinations of prior-art components should be viewed with caution.¹⁷⁸ Another

¹⁷² 35 U.S.C. § 103(a) (2006).

¹⁷³ *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007).

¹⁷⁴ See Jeanne C. Fromer, *The Layers of Obviousness in Patent Law*, 22 HARV. J.L. & TECH. 75, 76 (2008) ("Despite this overarching purpose highlighted in *KSR*, neither courts nor scholars have analyzed or settled on the obviousness inquiry's object, that is, the thing which must be nonobvious."); Michael J. Meurer & Katherine J. Strandburg, *Patent Carrots and Sticks: A Model of Nonobviousness*, 12 LEWIS & CLARK L. REV. 547, 548 (2008) ("The question of obviousness is central to determining patentability, yet what it means for an invention to be obvious in light of relevant prior art is one of the most difficult puzzles in patent law.").

¹⁷⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) ("Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.").

¹⁷⁶ 2 DONALD S. CHISUM, CHISUM ON PATENTS § 5.05 (2010); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 15-16 (1989) (demonstrating that the Federal Circuit is wary of simultaneous invention because many people could invent something nonobvious at the same time).

¹⁷⁷ *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998) ("The secondary considerations are . . . essential components of the obviousness determination . . ."); ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 716-24 (4th ed. 2007) (discussing the Federal Circuit's requiring secondary considerations as a prong in the obviousness analysis).

¹⁷⁸ *KSR*, 550 U.S. at 415 ("To this end, *Graham* set forth a broad inquiry and invited courts, where appropriate, to look at any secondary considerations that would prove instructive. Neither the enactment of § 103 nor the analysis in *Graham* disturbed this Court's earlier instructions concerning the need for

concern about secondary factors is that they may not reject patent claims most in need of rejection: commercially popular, yet small, advances over the prior art.¹⁷⁹

In practice, the factors fail to distinguish between obvious and nonobvious inventions because they are unable to distinguish success that results from an improvement over the prior art from success that is related to other factors, such as marketing prowess.¹⁸⁰ To remedy this shortcoming, courts should consider the incremental commercial benefit the information in the patent disclosure bestows (as distinct from the advantage arising from advertising or market share) to be a primary determination of obviousness.¹⁸¹

Unraveling secondary considerations is where an invention's usefulness can help determine whether a claim is obvious. In general, inventions that provide new or unexpected operable, practical, or commercial usefulness are more likely to be nonobvious.

Considering usefulness during obviousness analysis is not unheard of. Prior to the 1952 Act, the required improvement was called "invention," and such determination of inventiveness was sometimes tied, at least in part, to usefulness.¹⁸²

Rather than leaving the obviousness determination to secondary factors—which are proxies for usefulness—usefulness should instead be a direct consideration.¹⁸³ It is no coincidence that different secondary factors correspond to each of the three usefulness categories,¹⁸⁴ as discussed further below. Each of the three usefulness types could be used as a primary—

caution in granting a patent based on the combination of elements found in the prior art." (citation omitted)).

¹⁷⁹ See MERGES & DUFFY, *supra* note 177, at 612 ("[N]onobviousness tries to measure *technical, not economic, triviality*").

¹⁸⁰ Robert Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CALIF. L. REV. 805, 825-26 (1988) (pointing out that the nexus requirement does not distinguish between truly nonobvious successful inventions and inventions that are successful for other reasons). *But see* Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 404 (2008) ("[C]ourts should not discount findings of commercial success merely because that commercial success resulted from marketing expertise rather than technological skill by the patentee.").

¹⁸¹ Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1645 (2011) ("In sum, because society should gain some benefit if it is to tolerate the costs associated with granting a patent, the inducement standard focuses on the practical or commercialized invention, not merely a paper description of the invention."); Jonathan J. Darrow, *Secondary Considerations: A Structured Framework for Patent Analysis*, 74 ALB. L. REV. 47, 61-62 (2011).

¹⁸² See *Reckendorfer v. Faber*, 92 U.S. 347, 355 (1876).

¹⁸³ More technically, usefulness would determine whether a patent claim was obvious at the time it was invented.

¹⁸⁴ See, e.g., *United States v. Adams*, 383 U.S. 39, 52 (1966) (examining operable usefulness); *DeForest Radio Co. v. Gen. Elec. Co.*, 283 U.S. 664, 685 (1931) (considering "present utility" as a secondary factor to show nonobviousness); *Magnus & Easterman Co. v. United-Carr Fastener Corp.*, 61 F.2d 3, 5 (6th Cir. 1932) (using commercial success as evidence of usefulness).

rather than secondary—factor to determine whether an invention is obvious under Section 103.

While applying usefulness to obviousness requires a potentially difficult factual inquiry, just as existing law's factual inquiry might be difficult, usefulness determinations are normatively preferable because they more explicitly compare an invention's usefulness to the prior art. The traditional secondary factors, by contrast, may be completely unrelated to the invention's contribution to the art.

Unlike the eligible-utility test, which does not consider quantity, the amount of usefulness can and should be considered for obviousness. This is to be expected: by necessity, obviousness factors (such as the level of skill in the art to the amount and type of prior art considered¹⁸⁵) vary for each invention.¹⁸⁶ Thus, both the type and the quantity of usefulness required to show nonobviousness should vary by technology, skill level, or any other differentiator one might consider important.

A. *Operable Usefulness and Obviousness*

If an invention works when other attempts have failed, then the invention is likely nonobvious.¹⁸⁷ This phenomenon corresponds to two traditional secondary factors: failure of others and prior art that “teaches away” from the invention.¹⁸⁸ Operable usefulness puts the focus on the improvements provided by the invention; neither marketing nor advertising will make an inoperable invention operable. Of course, the new operability must represent a problem solved by the inventor, rather than by some exogenous source that makes operability possible for reasons having little to do with the inventor's own contribution to humankind's storehouse of knowledge.

Selden's 1879 automobile is often used as an example of obviousness; it epitomizes an invention that became operable only due to technological advances made by others.¹⁸⁹ Thus, the incremental improvement in operability is most important. This focus is a helpful input for determining whether a claim that combines old elements in a new way is obvious.¹⁹⁰

¹⁸⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

¹⁸⁶ *Machin*, *supra* note 100, at 447 (pointing out that significant commercial success is required to prove nonobviousness, but minimal commercial success is adequate to demonstrate utility).

¹⁸⁷ *Adams*, 383 U.S. at 52 (finding a showing of nonobviousness where those with skill in the art did not believe the invention would work); *In re Langer*, 503 F.2d 1380, 1392 (C.C.P.A. 1974) (holding that one must prove utility if a person skilled in the art would disbelieve a bare assertion that an invention works). In practice, this determination may not be possible until a patent is litigated.

¹⁸⁸ *Adams*, 383 U.S. at 52; *Merges*, *supra* note 180, at 866 (“[T]he failure of others provides an analytically rigorous foundation for determining nonobviousness.”).

¹⁸⁹ *MERGES & DUFFY*, *supra* note 177, at 615.

¹⁹⁰ *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-17 (2007).

Edison's light bulb using a carbonized bamboo filament is an example of new operability. In *The Incandescent Lamp Patent*, the Court considered the patentability of Sawyer and Man's patent on filaments made from any carbonized fibrous material.¹⁹¹ The Court held the patent nonenabled, ruling that excessive experimentation would be required to make a functional filament out of all of the carbonized materials encompassed by the claims.¹⁹²

Though routinely cited as a seminal enablement case, *Incandescent Lamp* is a bit puzzling because by using the patent disclosure, one could have, in fact, made a light bulb from a variety of the claimed materials.¹⁹³ The problem was that light bulbs made from almost all carbonized fibers would burn dimly or burn out very quickly.¹⁹⁴ Carbon filaments were old in the art, and Sawyer and Man claimed that their invention worked better than these prior filaments.¹⁹⁵ Sawyer and Man's invention's failure was not a lack of enablement, but instead failed operability of the newly claimed use (another application of the usefulness/novelty link) in the face of simultaneous efforts by others.¹⁹⁶

Thus, an alternative view of this case is that as a result of only marginal improvements in operability, the broad claim by Sawyer and Man was obvious in light of prior carbon filaments. In contrast, Edison far exceeded the operability threshold in a later patent with his bamboo filament, which burned for a much longer time than the prior-art filaments. The *Incandescent Lamp* Court alluded to this concept: "[E]ven the carbonized paper and wood carbons specified in the patent . . . were found to be so inferior to [Edison's] bamboo . . . that the [patentee] was forced to abandon its patent . . . and take up with the material discovered by [Edison]."¹⁹⁷ Thus, while Sawyer and Man's claim may have surpassed the minimal eligibility-utility bar, measuring operable usefulness reveals the obviousness of their purported invention.

¹⁹¹ *The Incandescent Lamp Patent*, 159 U.S. 465, 471-72 (1895).

¹⁹² *Id.* at 474 ("If the description be so vague and uncertain that no one can tell, except by independent experiments, how to construct the patented device, the patent is void.").

¹⁹³ *Id.* at 472 (describing tests of over six thousand different substances as potential filaments).

¹⁹⁴ *Id.* at 475 ("An examination of materials of this class carried on for months revealed nothing that seemed to be adapted to the purpose . . .").

¹⁹⁵ MERGES & DUFFY, *supra* note 177, at 270 ("Instead, they claimed to have discovered that carbonized fibrous or textile materials worked *better* than prior art carbon filaments. But that was not true. Some carbonized fibrous materials succeeded in working well . . . [and] many did not.").

¹⁹⁶ *Hartford-Empire Co. v. Obear-Nester Glass Co.*, 71 F.2d 539, 543-44 (8th Cir. 1934) ("The claim . . . reveals an apparatus which is operable in the sense that it will actually function but which is not useful because of the above vital practical defect. . . . The term 'useful,' as contained in the patent law, when applied to a machine, means that the machine will accomplish the purpose practically when applied in industry." (quoting *Besser v. Merrilat Culvert Core Co.*, 243 F. 611, 617 (8th Cir. 1917)) (internal quotation marks omitted)); see Note, *The Utility Requirement in the Patent Law*, 53 GEO. L.J. 154, 163 (1964).

¹⁹⁷ *The Incandescent Lamp Patent*, 159 U.S. at 475-76.

B. *Practical Usefulness and Obviousness*

Practical usefulness might be similarly applied to obviousness. Requiring an *important* (rather than simply *de minimis*) new practical application might weed out marginal inventions that barely serve practical purposes.¹⁹⁸ In the language of the obviousness test's traditional secondary factors, such inventions address no long-felt need, isolate no problem, and receive no praise by others. Like operability, practical usefulness also allows for a focus on the improvement provided by the invention itself, rather than success unrelated to its actual contribution to the art. One would expect that some advances in practical usefulness would be commercially successful; however, if the advance in practical usefulness is small, the claim might be obvious despite commercial success. In other cases, unexpected practical use might be considered evidence of nonobviousness.¹⁹⁹

For example, in *DeForest Radio Co. v. General Electric Co.*,²⁰⁰ the Court expressly considered "present utility" to determine whether a high-vacuum tube was nonobvious in view of the prior art, which taught low-vacuum tubes.²⁰¹ The Court concluded that the invention had no practical use at the time the application was filed, instead finding that the technical field's knowledge had expanded during the application's pendency.²⁰² The Court considered the claims obvious because the inventor had amended them during the patent's prosecution to keep pace with developing technology, so the claims merely reflected the art's own growth.²⁰³

Using practical usefulness, rather than secondary factors (such as long-felt need or praise by others), to evaluate obviousness would allow courts to apply a different standard to patents in each industry; they might require pharmaceutical and biotech companies to demonstrate a lower level of benefit so that patentability for them does not hinge on their conducting *in vivo* testing. This doctrine should be achievable because expected benefits of an

¹⁹⁸ ROBINSON, *supra* note 98, § 344 ("The utility of an invention is often properly considered by the courts in their investigation of two different topics, with which otherwise it has no connection: First, upon the question whether or not a given art or instrument was produced by the exercise of inventive as distinguished from mechanical skill, the actual utility of the invention may become important.")

¹⁹⁹ *In re Geisler*, 116 F.3d 1465, 1469 (Fed. Cir. 1997) (proffering unexpected results as evidence of nonobviousness).

²⁰⁰ 283 U.S. 664 (1931).

²⁰¹ *Id.* at 681-82 (asking "whether the production of the tube of the patent, with the aid of the available scientific knowledge that the effect of ionization could be removed by increasing the vacuum in an electric discharge device, involved the inventive faculty or was but the expected skill of the art").

²⁰² *Id.* at 685 ("The many amendments of Langmuir's application during its long pendency . . . constitute a history of the development of the art . . .").

²⁰³ *Id.* (asking if the vacuum tube "satisfied a long felt want or [if] its present utility is indicative of anything more than the natural development of an art which has passed from infancy to its present maturity since [the holder of the infringed patent] filed his application").

invention will always differ by industry.²⁰⁴ It should also be preferred as a doctrine because it recognizes the different ways inventions are created in different industries.²⁰⁵

C. *Commercial Usefulness and Obviousness*

Commercial usefulness is another potential direct input to test obviousness. The normative argument for considering commercial usefulness is that inventions with almost no commercial value are least deserving of a patent; factoring in commercial usefulness has the appeal of incentivizing commercially valuable development.²⁰⁶

Commercial usefulness is better for determining obviousness than its current doctrinal counterpart, the “commercial success” secondary factor. A product might be successful for many reasons other than usefulness and high value by the public, such as market share and advertising.²⁰⁷ To account for both possibilities, the Federal Circuit implemented the “nexus” rule, which requires that the commercial success secondary factor cannot be persuasive of nonobviousness unless there is some—though not necessarily a direct—connection between success and the invention.²⁰⁸ However, the nexus test is often insufficient to judge an invention’s contribution to the art.²⁰⁹

Commercial usefulness can help to sort out ambiguous reasons for success, because commercial *usefulness* is different than commercial *success*. Usefulness is unconcerned with how successful the product winds up being; it only looks to the expected effect an invention might have on supply and demand.²¹⁰ Commercial usefulness considers the availability of similar products and the different benefits that might drive consumers to choose the invented product. It also considers effects on manufacturing and distribution. While these elements may be important to commercial success, they are not necessary for commercial success. Further, when considering usefulness outside of the eligible-utility realm, courts may consider the *size* and *timing* of any commercial market benefit.

²⁰⁴ See, e.g., *Cross v. Iizuka*, 753 F.2d 1040, 1050 (Fed. Cir. 1985) (using industry practice as proof of practical utility).

²⁰⁵ See generally DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009) (arguing that patent policy should differ for different industries).

²⁰⁶ Machin, *supra* note 100, at 447.

²⁰⁷ See *Merges*, *supra* note 180, at 845-46.

²⁰⁸ *Id.* at 824-25.

²⁰⁹ See *id.* at 825-26 (comparing two patent cases with similar facts in which the Federal Circuit reached opposite conclusions when it applied the nexus test).

²¹⁰ See Risch, *supra* note 34, at 1240-41 (defining commercial utility in terms of predicted market effects).

Factors like anticipated growth in demand, new production, more effective distribution, and lower cost would impact patentability to the extent they are based on the invention's actual contributions as opposed to superior marketing. The analysis also permits consideration of benefits that may develop in the future; a pioneering invention like the transistor might open up several new markets, though not for some time.

Commercial usefulness necessarily requires a direct connection between the usefulness of the invention and its potential commercial benefits. Because actual success by the inventor is not required, the test considers not marketing prowess, but instead whether and how the invention might be made to satisfy a demand in a way that the prior art does not. Further, because an invention must be relatively well-developed to be commercially useful, nonobvious claims are more likely to contribute to existing technology than would a simple but undeveloped idea that is not yet sellable. The more developed the idea, the less obvious it might be.

D. *A Demonstrative Application*

A complex example of the interaction between each of the three conceptions of usefulness is found in *Reckendorfer v. Faber*,²¹¹ in which the Supreme Court invalidated claims covering a particular eraser-tipped pencil at a time when obviousness determinations more explicitly considered usefulness. There is no dispute that a pencil with an eraser attached should have been commercially successful.²¹² Indeed, the Court acknowledged that the invention was convenient, even as it ruled that it was obvious.²¹³ However, the three types of usefulness tell a different story about the invention's patentability.

First, the leap in operable usefulness was quite small—it took little manufacturing skill to create the particular type of pencil claimed.²¹⁴

Second, the invention provided relatively little improved practical usefulness. Pencil users already had separate erasers, so the attached eraser did not provide any new functionality other than, perhaps, some saved time.²¹⁵ These few moments were not even a new benefit; similar eraser-tipped pencils (with the erasers attached in different ways) already existed.²¹⁶ The practical benefits of the claimed pencil did not exceed those of other eraser-

²¹¹ 92 U.S. 347 (1876).

²¹² Grady & Alexander, *supra* note 111, at 331.

²¹³ *Reckendorfer*, 92 U.S. at 358.

²¹⁴ *See id.* at 355 (noting that the claimed pencil was to be made in the usual way as already practiced in the art).

²¹⁵ *Id.* at 356-58.

²¹⁶ *See id.* at 355 (noting that pencil-eraser combinations were well known in the art at the time of the invention).

tipped pencils.²¹⁷ While limited benefit should not be a bar to eligible utility under Section 101 (which the claimed invention had), such limitations are critical to obviousness determinations.

Third, though successful, the pencil had little commercial usefulness. Other pencils with erasers were available, so little new consumer demand was created.²¹⁸ Also, the new pencil appeared more expensive to manufacture because it involved cutting a groove into the wood,²¹⁹ and it was certainly more expensive than a separate pencil and eraser, both of which were in the prior art and available for purchase. Thus, new commercial usefulness was virtually nonexistent.

Given the minimal amounts of all three types of usefulness in the claimed pencil-eraser combination, it is no surprise that the Court found the claim obvious.

Despite the power of usefulness, it is unlikely that the analysis alone could replace the traditional obviousness test. Obviousness policy favors invalidating simple but highly useful inventions,²²⁰ so usefulness might be disfavored as too easily allowing such inventions. Instead, courts might prefer the discretionary nature of the law's current secondary factors to invalidate simple inventions.²²¹ If, however, incentivizing investments in highly useful but elegantly simple inventions becomes a policy goal, then a

²¹⁷ *Id.* at 356-57 (“An instrument or manufacture which is the result of mechanical skill merely is not patentable. . . . Perfection of workmanship, however much it may increase the convenience . . . is not patentable.”).

²¹⁸ *History of the Lead Pencil*, EARLY OFF. MUSEUM, http://www.officemuseum.com/pencil_history.htm (last visited Sept. 20, 2011) (explaining that one of the earliest references to the pencil-eraser combination was in 1853).

²¹⁹ The claim was not for the metal connecting ring that we think of today. To attach an eraser to a pencil, the patent applicant took “an ordinary lead-pencil,” cut a groove in it, and inserted “a piece of prepared india-rubber.” *Reckendorfer*, 92 U.S. at 355. In order to carry out the claimed invention, therefore, one would have to make the pencil and eraser—both of which were already capable of carrying out their intended use—and then further modify them to exacting specifications. These additional manipulations would certainly have increased the cost of making the invention, without providing any new functionality. *See id.* at 357-58 (discussing how the patented invention does not provide any new or different function from a separate pencil and eraser).

²²⁰ *See, e.g.*, Grady & Alexander, *supra* note 111, at 331 (“[A] monopoly on the original conception [of the eraser pencil or anesthesia] would have yielded such a large rent that inventors might have spent too much time trying to anticipate the next simple, wonderfully useful contrivance. The sheer usefulness of an idea . . . can overtly skew the patent calculus.”).

²²¹ *See, e.g.*, *McClain v. Ortmayer*, 141 U.S. 419, 428 (1891).

If the generality of sales were made the test of patentability, it would result that a person by securing a patent upon some trifling variation from previously known methods might, by energy in pushing sales or by superiority in finishing or decorating his goods, drive competitors out of the market and secure a practical monopoly, without in fact having made the slightest contribution of value to the useful arts.

Id.; Note, *supra* note 196, at 159-62 (discussing the factors that can be used to demonstrate that the utility requirement is met).

direct usefulness test for nonobviousness would be a better vehicle for achieving that goal.

V. USEFULNESS AND ENABLEMENT

Enablement rules typically serve two functions. First, they ensure a complete disclosure of how to make and use the invention. Second, they help ensure that claims are no broader than what has been taught by the patent specification. Usefulness plays an important role in resolving unanswered questions relating to both of these purposes.

This Part starts by pointing out that usefulness may be important as a non-input; that is, the usefulness analysis should be kept distinct from the question of whether the specification has described how to make and use an invention. Conflating usefulness and enablement leads to a confused statutory reading that misses the purpose of each requirement.

This Part goes on to explain how usefulness can be used to determine whether broad pioneering claims are valid. Determining whether a patent seeks to claim more than the inventor contributed is a fundamental but unsolved problem in patent policy. Usefulness provides a previously undiscovered solution to the problem and allows courts to more precisely determine the scope of the claims to which an inventor is entitled.

A. *Usefulness and “How to Use”*

An area of theoretical confusion is the distinction between Section 101’s requirement that inventions be “useful” and Section 112’s requirement that applicants describe “how to make and use” inventions.²²² In many cases, these requirements collapse into a single requirement, but confusion between the two can create problems.

Understanding these potential problems begins with recalling the purpose of each requirement. Section 101 requires that an invention be useful—however defined—to be patent eligible. Section 112 concerns the teaching function of patents; applicants must provide enough information to enable others to make and use claimed inventions.²²³ Section 101 is necessary to have created a patentable invention, while Section 112 is a condition

²²² See Johnson, *supra* note 91, at 307-10 (discussing confusion between Sections 101 and 112).

²²³ 35 U.S.C. § 112 (2006); see also Sean B. Seymore, *Heightened Enablement in the Unpredictable Arts*, 56 UCLA L. REV. 127, 166 (2008) (“Although the written description should not become a scientific treatise, in many ways a scientific publication and the written description share similar goals, namely to disclose something novel, to teach fellow artisans how to replicate the invention or discovery, and to spur further innovation in the field.” (footnotes omitted)).

that the applicant's disclosure must satisfy in order to receive a patent on that invention.²²⁴

When a patent fulfills either Section 101 or Section 112, but not both, confusing the two sections can cause a misreading of the plain language of the statute. Such misreading diminishes the ability of usefulness to act as a policy lever. In this sense, usefulness should be a nonconsideration. Usefulness should be removed from adequate disclosure analysis.

1. Eligible Practical Utility

As a matter of logic, if an invention has no practical utility, then it will be difficult to tell someone how to use it.²²⁵ Thus, courts have often allowed Section 101 and Section 112 to collapse into a single requirement.²²⁶ However, these sections may not coincide with respect to practical utility.

For example, "throwaway utility" may technically satisfy Section 112, but it cannot meet the standard for Section 101. One might describe in detail many ways to use a practically useless invention: a book can always be used as a doorstop, and a pet rock can break a window. A description of *any* use, however unrelated to its novelty, satisfies the plain language of Section 112's disclosure requirements if a person of ordinary skill could read the patent specification and carry out the described use.

Sections 101 and 112 might also not overlap for processes whose products have no practical utility. A description of the process might satisfy Section 112's "how to use" requirement, because one skilled in the art could follow the steps the specification describes to yield the useless end product. Nonetheless, the process lacks eligible practical utility under Section 101 because the resulting product is not practically useful.²²⁷ *Bilski*'s general hedging claim falls under this category. One might follow the detailed steps described in the patent disclosure; however, the broad, general claim does not reach a practically useful result. *Bilski* illustrates another particular disconnect that precludes a complete overlap—Section 112 refers

²²⁴ Brent Nelson Rushforth, *The Patentability of Chemical Intermediates*, 56 CALIF. L. REV. 497, 514 (1968) ("[I]f a compound or process is useful . . . and the disclosure in the application is sufficient to show the [person skilled in art] how to use the invention, then it fulfills the requirements of utility in section 101 and the requirements of disclosure in section 112.").

²²⁵ *In re Brana*, 51 F.3d 1560, 1564 (Fed. Cir. 1995); see also Note, *supra* note 196, at 185-86 (explaining how the disclosure of instructions on how to use an invention demonstrates the utility of a patent whose usefulness is not immediately clear).

²²⁶ *Brana*, 51 F.3d at 1564 ("The requirement that an invention have utility is found in 35 U.S.C. § 101 It is also implicit in § 112 ¶ 1").

²²⁷ See *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966) ("[A patent] creates a monopoly of knowledge which should be granted only if clearly commanded by the statute. Until the process claim has been reduced to production of a product shown to be useful, the metes and bounds of that monopoly are not capable of precise delineation.").

to the entire patent disclosure, while Section 101 requires that *each claim* be useful.

*In re Fisher*²²⁸ illustrates a divergence and a reason why Sections 101 and 112 should be considered separately. In *Fisher*, the patent application claimed incomplete DNA fragments (called “ESTs”) of corn genes.²²⁹ However, the inventor did not know the purpose of the gene from which the fragments were taken.²³⁰ A researcher reading the *Fisher* application would probably know how to use the ESTs to locate the underlying gene; as such, it enabled one to use the claimed gene fragments. Under this interpretation, the claim complied with Section 112. However, because the purpose of the underlying gene was unknown, the EST did not have eligible practical utility under Section 101.²³¹

Despite this straightforward statutory division of labor, the Federal Circuit also rejected the claims under Section 112.²³² This blurred the purposes of Sections 101 and 112; the disclosure was sufficient to teach how to use ESTs, but the court still rejected it. The doctrinal problem caused by the court’s opinion is that if investigators later found a use for the underlying gene, *Fisher* is precedent that the disclosure was inadequate, when in fact the disclosure turned out to be sufficient. This might have wrongfully barred a future patent. Such an outcome is unlikely in the *Fisher* case because of publication, but the problem might arise more often for related patent applications before the PTO, where a patentability determination in one application might affect a related application considered later in time.

Even though the confusion does not necessarily lead to conflicting outcomes in every case, the issue is worth considering. The goal of understanding the role of usefulness is to have a principled understanding of these difficult doctrinal questions so courts do not wrongly decide close cases based on an unprincipled reading of the statute.

2. Operability

As it is with practical utility, an adequate description of how to make and use the invention under Section 112 is often evidence of eligible opera-

²²⁸ 421 F.3d 1365 (Fed. Cir. 2005).

²²⁹ *Id.* at 1367.

²³⁰ *Id.* at 1368.

²³¹ *Id.* at 1371. *But see* Meigs, *supra* note 84, at 470-71 (questioning whether knowledge of the underlying functions of the genes is necessary for the utility requirement, given that new microarray technologies can analyze DNA sequences to identify specific and useful functions without knowing the characteristics of the whole gene).

²³² *Fisher*, 421 F.3d at 1378-79.

ble utility under Section 101.²³³ If one can make and use the invention, then it likely operates. In fact, a complete disclosure is sufficient to consider a claim constructively reduced to practice even if the applicant has not actually built the invention.²³⁴ When the disclosure is the basis for reduction to practice, operability is presumed from the patent application rather than from evidence of operation.²³⁵

However, an important divergence occurs when one describes how to make and use an inoperable invention. The perpetual-motion machine is the paradigmatic case, but more significant inventions might fall prey to this rule.²³⁶ For example, one can describe how to manufacture and to administer a drug in compliance with Section 112, but if the drug does not work, it fails under Section 101.²³⁷

*Rasmusson v. SmithKline Beecham Corp.*²³⁸ illustrates an enabling description of an inoperable invention and the confusion that can arise when description is confused with operability. There, the inventor disclosed a cancer treatment but did not have evidence that the method worked. The Federal Circuit relied on Section 112 in ruling that the patent application did not disclose how to “use” the invention, rejecting Rasmusson’s argument that the patent clearly described how to administer the drug.²³⁹ Indeed, administering a particular drug was the very nature of the claimed invention.²⁴⁰ While Rasmusson may have lacked evidence of operable utility because he did not know if the treatment would work, he certainly taught others how to use the invention—that is, the physical step of administering the drug to a patient. Thus, any rejection should have been based on Section 101 rather than a perpetuated misreading of Section 112; usefulness should have been a non-input. As was the case in *Fisher*, if Rasmusson had ga-

²³³ See, e.g., *In re Langer*, 503 F.2d 1380, 1395 (C.C.P.A. 1974) (limiting the scope of claims limited to proven utility); *In re Buting*, 418 F.2d 540, 543-44 (C.C.P.A. 1969) (limiting the scope of the claims to proven operable utility).

²³⁴ The Telephone Cases, 126 U.S. 1, 536 (1888).

²³⁵ See, e.g., *id.* at 535 (“It is quite true that when Bell applied for his patent he had never actually transmitted telegraphically spoken words . . . but in his specification he did describe accurately and with admirable clearness his process . . . to accomplish his purpose . . . [and] with sufficient precision to enable one of ordinary skill in such matters to make it”); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986) (“[A]nd, as has long been the law, constructive reduction to practice occurs when a patent application on the claimed invention is filed.”).

²³⁶ See *Cleveland Punch & Shear Works Co. v. E. W. Bliss Co.*, 145 F.2d 991, 1001 (6th Cir. 1944) (finding the patent as described and claimed inoperable, even though others with skill in the art could have determined how to make it operable); Note, *supra* note 196, at 164 (“If the entire theory of operation of the invention is erroneous as presented in the specification, utility is negated.”).

²³⁷ Wolffe, *supra* note 72, at 65.

²³⁸ 413 F.3d 1318 (Fed. Cir. 2005).

²³⁹ *Id.* at 1322-23 (“As this court has explained, ‘the how to use prong of section 112 incorporates as a matter of law the requirement of 35 U.S.C. § 101 that the specification disclose as a matter of fact a practical utility for the invention.’” (quoting *In re Cortright*, 165 F.3d 1353, 1356 (Fed. Cir. 1999))).

²⁴⁰ *Id.* at 1322.

thered evidence of operability after losing at the Federal Circuit and filed a follow-on application (called a continuation) based on that evidence, he would have the difficult task of overcoming the court's precedential holding that his disclosure was insufficient.

3. Distinguishing Operability, Practicality, and "How to Use"

As discussed above, many judicial opinions fail to distinguish between operable usefulness, practical usefulness, and how-to-use enablement. However, where the requirements of each doctrine diverge, usefulness is a critical policy lever. If the disclosure teaches one to make and use the invention—satisfying enablement—but it is unclear whether one skilled in the art would find it operable or practical, then usefulness is the outcome determining consideration and therefore must be carefully considered.²⁴¹

As noted above, courts have more recently confused eligible utility and "make and use" enablement, often misreading the statute to give them the same meaning.²⁴² In doing so, they have diminished each element's power to perform its allotted role in a principled way, turning eligible utility into an unhelpful test.

The much-cited *In re Brana*²⁴³ opinion both illustrates and perpetuates this confusion by overlapping both practical and operable utility with "how to use" enablement. The disputed claims covered a therapeutic compound.²⁴⁴ The patent examiner rejected them for failure to describe how to make and use the compound because the applicant lacked evidence of a practical use for the compound, and the Board of Patent Appeals and Interferences affirmed the rejection.²⁴⁵ The Federal Circuit noted that the grounds for rejection (lack of practical utility) traditionally fell under Section 101, but that Section 112 could apply to the same rejection; the court

²⁴¹ The Telephone Cases, 126 U.S. 1, 536 (1888).

Precisely how that subtle force operates under Bell's treatment, or what form it takes, no one can tell. All we know is that he found out that, by changing the intensity of a continuous current so as to make it correspond exactly with the changes in the density of air caused by sonorous vibrations, vocal and other sounds could be transmitted and heard at a distance. This was the thing to be done, and Bell discovered the way of doing it.

Id. at 538-39; *In re Vaeck*, 947 F.2d 488, 496 (Fed. Cir. 1991) ("This means that the disclosure must adequately guide the art worker to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility.").

²⁴² See discussion *infra* Part V.A.

²⁴³ 51 F.3d 1560 (Fed. Cir. 1995).

²⁴⁴ *Id.* at 1562.

²⁴⁵ *Id.* at 1563-64.

relied on the adage that one cannot describe how to use a compound that has no use.²⁴⁶

The court went on to squeeze Section 101 practical-utility concepts into Section 112 rhetoric, reasoning that if one does not know which disease the compound will cure, then one cannot describe how to use it.²⁴⁷ The court then seamlessly shifted into considering Section 101 operable utility without any explanation of how such a requirement relates to the “make and use” requirement of Section 112.²⁴⁸ One might presume that the court interpreted allegedly inconclusive tests of operability (i.e., therapeutic benefit) to mean that the applicant did not know how the compound could be practically used. However, this rationale makes little sense, as the therapeutic tests would be testing whether the compound had a biological effect on some particular biological property, such as reduction in tumor size. It is true that such tests might have been time-consuming or expensive, but that fact alone does not make the experimentation “undue” and the specification nonenabling.²⁴⁹

The problem with this unstated collapsing of practical and operable usefulness together, and further confusing them with make-and-use principles, is that the applicant made the benefit—antitumor activity—quite clear in the specification, and the real dispute was about whether in vitro tests were sufficient to show operability with respect to such antitumor benefits.²⁵⁰

The overlap between operable usefulness and how-to-use enablement does not necessarily hold in every case. For example, the description in *Brana* surely disclosed one way to use the compound—by administering it, like other pharmaceuticals.²⁵¹ A claimed compound may have no therapeutic benefit, of course, but that fact alone does not mean one has failed to disclose how to use it.

Because there are several ways one may satisfy Section 112 but not Section 101, and because Section 112 performs work that is otherwise not required for Section 101 to function, the two sections should be distin-

²⁴⁶ *Id.* at 1564 n.12 (“This court’s predecessor has determined that absence of utility can be the basis of a rejection under both 35 U.S.C. § 101 and § 112 ¶ 1.”).

²⁴⁷ *Id.* at 1564 (“The first basis for the Board’s decision was that the applicants’ specification failed to disclose a specific disease against which the claimed compounds are useful, and therefore, absent undue experimentation, one of ordinary skill in the art was precluded from using the invention.”).

²⁴⁸ *Id.* at 1565-66 (“The second basis for the Board’s rejection was that, even if the specification did allege a specific use, applicants failed to prove that the claimed compounds are useful.”).

²⁴⁹ *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988) (“The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed.” (quoting *Ex parte Jackson*, 217 U.S.P.Q. (BNA) 804, 807 (B.P.A.I. 1982))).

²⁵⁰ *Brana*, 51 F.3d at 1562-64.

²⁵¹ *See id.* at 1564, 1568; Michael J. Shuster et. al., *Protecting Rights to Early-Stage Technology*, 21 NATURE BIOTECHNOLOGY 701, 702 (2003).

guished normatively and doctrinally. Separate determinations should be made about (1) whether an invention has an eligible use and, if so, (2) whether the applicant has described how to use it. Distinguishing these doctrines from each other will better address the requirements of each. At the very least, the confusion caused unnecessary rejections by the examiner and Board of Patent Appeals and Interferences in *Brana*.

More important, by failing to require this separation, *Brana* confused the issue and diminished usefulness's ability to act as a policy lever. Consider, for example, cases like *Rasmusson*.²⁵² There, operable usefulness barred patenting a therapeutic drug because the drug's effectiveness was unknown. The eligible-utility rule, requiring a showing of operability, succeeds when it weeds out theoretically impossible inventions like perpetual-motion machines. In requiring proof of operability, however, it also denies some early-filed but tremendous advances—like Rasmusson's—because no one thinks they will work, even if it later turns out they do. Worse, the rule can deprive pioneering inventors like Rasmusson from securing patent protection when they can later show that their inventions in fact work, because the finding of inoperability in the original patent application may bar patentability in follow-on applications.

The usefulness analysis thus could be modulated as necessary to effectuate different policy goals. If a court wishes to reward pioneering work, for example, the evidence required to show operability might be reduced. There is no reason why Rasmusson's cancer treatment could not have been considered useful if policy favored early patenting of prophetic therapeutic inventions; instead, however, the court in that case seems to have preferred giving an incentive to later experimenters who test proposed solutions.

This is where the confusion with Section 112 hurts. When policy favors full development of therapeutic treatment prior to patenting, then usefulness doctrine will deny a patent on the invention, even if one could make and administer it.²⁵³ However, when courts and the PTO find that the application does not describe how to “use” the invention when the specification obviously does so, they lose sight of the real issue—the very question in *Brana*—which is how much evidence of therapeutic benefit is required to show operability.²⁵⁴ This nuance is lost (and was lost in *Brana*) if the focus is on “how to use,” which diminishes the ability to tweak usefulness for policy goals.

²⁵² See *In re '318 Patent Infringement Litig.*, 583 F.3d 1317, 1325-27 (Fed. Cir. 2009) (finding that a hypothesis and proposed test is insufficient to establish enablement).

²⁵³ Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 127 (2009) (“Technological areas such as chemistry and biology . . . are already under patentability requirements that de facto force the inventor to actually reduce the invention to practice prior to filing.” (footnote omitted)).

²⁵⁴ See *Brana*, 51 F.3d at 1565-68.

The same argument applies to research tools. Usefulness is an important policy lever because such tools technically satisfy the “how to use” requirement. Thus, relaxing eligible practical utility requirements should have a direct effect on the patentability of such tools. However, if practical use is confused with Section 112’s “how to use” requirement, it becomes more difficult for a court to modulate the threshold of patentability by varying the amount or type of public benefit it will require an applicant to demonstrate to show an invention has eligible practical utility.

4. Usefulness and “How to Make”

Confusion is not limited to how-to-use cases; courts have also blurred usefulness with how-to-make concerns. Here, too, usefulness should not be a consideration in disclosure rules. The benefits of distinguishing Sections 101 and 112 run the other way in how-to-make cases, however; there may be times when an invention shows eligible utility, but the applicant fails to properly describe how to make it.

Distinguishing usefulness from how-to-make enablement helps courts determine whether the patentee actually invented the entire scope of a broadly claimed product or process. This situation arises when the inventor invents one incarnation of an invention but does not sufficiently understand the general principles of the invention to claim all related embodiments of the invention. In such cases, Section 112 denies patents to applicants who did not actually invent all of what they are claiming.²⁵⁵ And even if the inventor did invent the broad claim, Section 112 performs a separate task—it helps ensure that the inventor cannot gain the benefit of a patent while retaining essential know-how and practicing the invention as a trade secret while others struggle to replicate the invention.²⁵⁶

Even though eligible utility should be kept separate from how-to-make enablement considerations, usefulness might still be considered more generally in these determinations. The *Incandescent Lamp Patent* case dis-

²⁵⁵ Michael Risch, *A Brief Defense of the Written Description Requirement*, 119 YALE L.J. ONLINE 127, 128 (2010) (discussing how the disclosure requirement ensures that applicants actually invented the subject matter they claim); Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 224-25 (2007) (considering written description and enablement requirements important for determining scope of patentable claims).

²⁵⁶ If Section 112 is not strictly enforced, it may fail to achieve the intended outcome. *See, e.g.*, Elisabetta Ottoz & Franco Cugno, *Patent-Secret Mix in Complex Product Firms*, 10 AM. L. & ECON. REV. 142, 143 (2008) (“As trade secret protection is relinquished to the extent an invention is disclosed in a patent application, there is sometimes motivation to minimize the disclosure made in a patent application in order to obtain broad patent protection and yet retain significant trade secret protection.”); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 355 (2010) (“Indeed, inventors are often able to retain important commercial know-how, such as software source code, as trade secrets and still obtain a patent.”).

cussed above²⁵⁷ highlights the way that usefulness should be used as a consideration in, but not as a replacement for, how-to-make analyses. When the invention works but does not work terribly well, then operability, rather than how-to-make enablement, may be at issue.²⁵⁸ One could have made a wide variety of filaments based on the disclosure in the Sawyer and Man patent, but most were not operable in light bulbs. It would not have taken undue experimentation to make the claimed filaments. Rather, it would have taken undue experimentation to make *operable* filaments—a tiny subset of those claimed.²⁵⁹ Such a deficiency should have led to a denial based on lack of eligible operable utility. The problem, however, is that even the filaments that failed were minimally operable—they burned dimly or briefly (or both), but they still illuminated.²⁶⁰ Sawyer and Man’s disclosure, therefore, met the de minimis eligible-utility threshold.

Yet the claim should have been rejected, just as it was, due to its limited operable usefulness. Unlike Section 101’s eligible utility, which is satisfied with so little usefulness, enablement determinations can be informed by the amount of usefulness. Considering the amount of usefulness allows the fact finder to determine whether an applicant has adequately described how to make the invention to sufficiently provide the proffered use.²⁶¹ Because Sawyer and Man did not understand the general principles underlying their claimed novel use of the invention—a *better* filament—they were unable to describe how to make that better filament. If the Court had conducted its how-to-make inquiry without implicitly considering usefulness, then it would have found the patent valid because without a doubt, the specification described how to make filaments, albeit barely useful ones.

B. *Usefulness and Claim Scope*

As the *Incandescent Lamp* case shows, the make-and-use enablement requirement can help ensure that the inventor actually invented the broadest

²⁵⁷ See *supra* notes 77-82, 191-98 and accompanying text.

²⁵⁸ This is why *The Incandescent Lamp Patent* is puzzling—the description clearly allows one to make and use the bulb with a variety of materials; the real problem is that the bulb is inoperable.

²⁵⁹ *The Incandescent Lamp Patent*, 159 U.S. 465, 472-73, 475 (1895).

²⁶⁰ See *id.* at 471, 474-76.

²⁶¹ *But see* *Hildreth v. Mastoras*, 257 U.S. 27, 34 (1921) (“The machine patented may be imperfect in its operation; but if it embodies the generic principle, and works, that is, if it actually and mechanically performs, though only in a crude way, the important function by which it makes the substantial change claimed for it in the art, it is enough.”). By this test, then perhaps Sawyer and Man were entitled to their patent.

scope of his or her claims.²⁶² If the patent claims all filaments, then the specification must teach how to make *all* filaments, not just a particular type. Like eligible utility, make-and-use enablement is considered in light of the art's knowledge at the time of invention.²⁶³

Determining just how much the inventor may claim is a difficult doctrinal question, however, when (as was the case in *Incandescent Lamp*) one might argue that the disclosure would allow a skilled artisan to make *some form* of the claimed invention. A pioneering inventor of a new class of goods can often claim the entire genus, while most subsequent inventors must limit themselves to claiming a species within the larger genus. For example, if no filaments exist, and a patent describes how to make the first filament ever, then the patent's inventor is typically entitled to claim *all* filaments.²⁶⁴ If, however, filament technology is more advanced, a claim encompassing all conceivable filaments will only be enabled by a more detailed disclosure.

The difficult question is determining whether the specification has enabled the broad genus.²⁶⁵ A recent case illustrating the difficulty of this question is *Laboratory Corp. of America Holdings v. Metabolite Laboratories, Inc.*²⁶⁶ In that case, the inventors developed a particular way to measure homocysteine levels in blood²⁶⁷ and also discovered a correlation between elevated homocysteine and a particular vitamin deficiency.²⁶⁸ The inventors claimed the use of *any* homocysteine test to diagnose the deficiency, even though they only described one type of test.²⁶⁹ The Supreme Court granted *certiorari* to determine whether the diagnostic-assay claim was patentable subject matter but later dismissed the writ as improvidently granted.²⁷⁰ A strong dissent, however, argued that the claim was an unpatentable natural phenomenon.²⁷¹

²⁶² See also *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 117 (1854) (indicating that Morse claimed more than he invented); Grady & Alexander, *supra* note 111, at 324 (explaining that Bell did not attempt to claim communication technology beyond what he invented).

²⁶³ *U.S. Steel Corp. v. Phillips Petrol. Co.*, 865 F.2d 1247, 1251-52 (Fed Cir. 1989); MERGES & DUFFY, *supra* note 177, at 295-96; Kevin Emerson Collins, *Enabling After-Arising Technology*, 34 J. CORP. L. 1083, 1085-86 (2009).

²⁶⁴ Other rules, like the reverse doctrine of equivalents, might serve to protect later inventors who create the same class of invention but in a completely different way, such as fluorescent lights which use no filaments. See Collins, *supra* note 263, at 1091-92.

²⁶⁵ Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 848-49 (1990) (discussing difficulty in determining how broad claims should be in light of specification).

²⁶⁶ 548 U.S. 124 (2006) (per curiam).

²⁶⁷ *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1358-59 (Fed. Cir. 2004), *cert. dismissed*, 548 U.S. 124 (2006) (per curiam).

²⁶⁸ *Id.* at 1358.

²⁶⁹ *Id.* at 1358-59.

²⁷⁰ *Lab. Corp.*, 548 U.S. at 125; *id.* at 25-26 (Breyer, J., dissenting).

²⁷¹ *Id.* at 138.

While most think of *Lab. Corp.* as a patentable-subject-matter case, it is, in many ways, an enablement case.²⁷² There are many patents that claim methods of diagnosing diseases using particular assays, so subject-matter eligibility should not have been a question.²⁷³ The real concern in this case was that the inventors claimed the use of *all* homocysteine assays but only disclosed *one* such assay. The inventors would argue that they invented the genus because they were the first to discover this method of measuring the vitamin deficiency; they were the first to discover the correlation between homocysteine and folate deficiency, and to provide that benefit to the public. Others might say, however, that laboratories should be free to use pre-existing (or later-discovered) homocysteine assay methods to diagnose the deficiency, because folate deficiency occurs in nature, so old tests cannot be included in Metabolite's genus claim because they were known at the time that application was filed.²⁷⁴ Thus, the question is about whether the applicants actually invented the extremely broad claims across their entire scope—diagnosing a disease with any pre-existing blood test. This question is difficult to answer.

Fortunately, usefulness is a factual predicate that provides helpful clues to determine which inventions are truly pioneering and, therefore, entitled to a broad claim scope.²⁷⁵ Patent specifications that represent significant leaps in usefulness, solutions to problems that are long unsolved, completely new ways of achieving a goal, or discoveries of new problems are more useful and should be entitled to broader claims.²⁷⁶ This makes intuitive sense—pioneering inventions get that name for a reason.²⁷⁷ If the

²⁷² Risch, *supra* note 24, at 627-28.

²⁷³ Indeed, many argue that it was not an issue, which was why the matter was dismissed. However, the Supreme Court recently granted certiorari to decide whether a “a patentee can monopolize basic, natural biological relationships” by claiming that 35 U.S.C. § 101, in light of the *Bilski v. Kappos* decision, “is satisfied by a patent claim that covers observed correlations between blood test results and patient health, so that the claim effectively preempts all uses of the naturally occurring correlations, simply because well-known methods used to administer prescription drugs and test blood may involve ‘transformations’ of the body chemistry.” Petition for a Writ of Certiorari at Question Presented, *Prometheus Labs., Inc. v. Mayo Collaborative Servs.*, 628 F.3d 1347 (Fed. Cir. 2010) (No. 2008-1403), 2011 WL 992001, at *i, *cert. granted*, 131 S. Ct. (2011).

²⁷⁴ See *Lab. Corp.*, 548 U.S. at 135, 137-38 (Breyer, J., dissenting).

²⁷⁵ See Grady & Alexander, *supra* note 111, at 319-20 (explaining how the “technological signal” of a patent will affect its patentability); A. Samuel Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century*, 38 AM. U. L. REV. 1097, 1119-20 (1989) (describing how utility standards affect revolutionary inventions most severely).

²⁷⁶ See Johnson, *supra* note 91, at 319-20 (arguing that since claim scope is narrowed to the specific uses described in the specification, the incentive-to-invent theory may not apply to the biotechnology field).

²⁷⁷ *Merges & Nelson, supra* note 265, at 848-49.

usefulness of the patent is questionable, however, then the inventor does not deserve a broad claim scope.²⁷⁸

For example, in *Lab. Corp.*, the inventors claimed to have identified the only accurate way (at that time, and perhaps even now) to diagnose folate deficiency. They described in detail the shortcomings of prior-art assays and why such methods were not as useful as theirs.²⁷⁹ The patent disclosed a much more useful (operably, practically, and commercially) diagnostic for folate deficiency. It was significantly more operable because it was the only assay that could accurately identify folate deficiency. It was highly practically useful because its accuracy provided significant benefits to the public that did not exist, despite the pre-existing but undiscovered natural correlation. Consumers certainly desired the assay's operability and practical benefits, especially because the new test was no more expensive than the alternatives, so the assay was commercially useful as well.

There were other folate-deficiency tests on the market at the time of *Lab. Corp.*, but the fact that the defendant licensed the patented assay from the patent holder for quite some time²⁸⁰ implies a high degree of usefulness. Assuming the comparisons to the prior art in the patent disclosure are correct, the diagnostic claim should be entitled to a broad scope.

Compare *O'Reilly v. Morse*,²⁸¹ in which Morse described one type of telegraph but claimed all forms of printed communication by any electromagnetic signal.²⁸² There, the Supreme Court invalidated the broad claims,²⁸³ and from a usefulness perspective, with good reason. When Morse filed his patent application, there were several incarnations of electromagnetic communications operated in the United States and Britain.²⁸⁴ Further, telegraphic signals had long been sent (albeit not printed) by two forms of electromagnetism—light and electricity.²⁸⁵ Furthermore, there was

²⁷⁸ See *In re Langer*, 503 F.2d 1380, 1395 (C.C.P.A. 1974) (holding scope of claims limited to proven utility); *In re Buting*, 418 F.2d 540, 543-44 (C.C.P.A. 1969) (holding claim scope limited to proven operable utility); David G. Perryman & Nagendra Setty, *The Basis and Limits of the Patent and Trademark Office's Credible Utility Standard*, 2 J. INTELL. PROP. L. 509, 513-14 (1995).

²⁷⁹ U.S. Patent No. 4,940,658 col.3, ll.44-47 (filed Nov. 20, 1986) ("Routine screening of the general population or those with only moderate anemia, or moderate macrocytosis, or other neuropsychiatric abnormalities, would lead to high numbers of false positives.").

²⁸⁰ See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124, 128 (2006) (Breyer, J., dissenting).

²⁸¹ 56 U.S. (15 How.) 62 (1854).

²⁸² *Id.* at 77-78.

²⁸³ *Id.* at 120. *O'Reilly* is usually considered a subject-matter case, but the holding relates as much to enablement as to subject matter. See Risch, *supra* note 24, at 600. But see Lemley et al., *supra* note 28, at 1332 (arguing that Morse's claim was arguably enabled, yet still too broad from a subject-matter viewpoint).

²⁸⁴ MERGES & DUFFY, *supra* note 177, at 88-89.

²⁸⁵ See TOM STANDAGE, *THE VICTORIAN INTERNET: THE REMARKABLE STORY OF THE TELEGRAPH AND THE NINETEENTH CENTURY'S ON-LINE PIONEERS* 18-19 (1998).

competition in the telegraph industry right after the patent issued.²⁸⁶ While Morse's specific telegraph may have been new and even better than others', it did not represent a *tremendous* leap forward in operable, practical, or commercial usefulness. Therefore, the relatively limited new usefulness the patent disclosed did not warrant a broad claim to all printed communication by electromagnetism.²⁸⁷

To be sure, usefulness cannot answer all claim scope questions, but court and commentators underappreciate its availability to tweak the level of protection for both new ways to solve problems or pioneering claims.

VI. USEFULNESS AND PATENT REFORM

An invention's usefulness might be used to inform policymakers in two areas of patent reform, including the provisions of the recent America Invents Act.²⁸⁸ This Part predicts first that usefulness will still have a role to play when patents are awarded to the first inventor to file a patent application, rather than the first party to actually invent the claimed subject matter. It then urges that usefulness should be a more important factor in damage calculations; a patent's usefulness is directly related to its value.

A. *Usefulness and First-To-File*

The timing aspect of the usefulness inquiry will be an important policy lever when the United States moves to a first-to-file patent system.²⁸⁹ Under the first-to-invent system (which has been the law in the United States since its inception),²⁹⁰ when two inventors claimed the same invention, complex rules—rules that favor the first to invent—applied to determine who is entitled to the patent.²⁹¹ Two inventors applying for patent claim led to an “interference” between the two applicants, a potentially costly and time-consuming litigation in the PTO. Under a first-to-file system, on the other hand, the first inventor to apply for a patent will win, even if someone else

²⁸⁶ *See id.* at 43.

²⁸⁷ Grady & Alexander, *supra* note 111, at 323 (suggesting that Morse provided insufficient information for future inventors to further develop electromagnetic communication).

²⁸⁸ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

²⁸⁹ President Barack Obama signed the Leahy-Smith America Invents Act into law on September 16, 2011. *See* Pub. L. No. 112-29, 125 Stat. 284 (2011).

²⁹⁰ Sedia, *supra* note 289, at 81-82.

²⁹¹ 35 U.S.C. § 102(g) (2006).

had independently invented it first.²⁹² This simplicity, proponents of the first-to-file system say, will greatly reduce the cost of the patent system.²⁹³ Usefulness will still play an important policy role in a first-to-file system. If an invention lacks eligible utility, then the PTO will not consider it reduced to practice, even if an inventor successfully described how to make the invention in the first-filed patent application. As a result, an inventor who files later but is the first to discover a use would be entitled to the patent instead. Thus, where eligible utility is concerned, some procedure should be used to determine whether a first-filed application disclosed a use before a second-filed application claiming the same thing is rejected.²⁹⁴

Changing eligible-utility requirements will have the same effect on races to the PTO, regardless of whether the system rewards the first to file or the first to invent. Requiring a particular type or amount of usefulness would vary the timing of patent filings and breadth of patent disclosures,²⁹⁵ which, in turn, could profoundly affect races to the patent office.²⁹⁶

One might still ask whether incorporating usefulness analysis would have a *greater* effect in a first-to-file system than in the first-to-invent system. In theory, the results should be the same; regardless of the required amount and type of eligible utility, if no patent may be granted when utility is lacking, then a rational applicant will hold off on filing until he (or someone else) discovers a utility for the invention. Of course, a first-to-file system might incentivize an earlier filing once eligible utility is discovered, but that incentive is provided by the priority rule, not the usefulness requirement.

B. *Usefulness and Damages*

Usefulness may also be helpful in determining the proper amount of damages to award in patent cases. As currently conceived, a patent's de

²⁹² This does not necessarily mean the later inventor will be awarded a patent. If the first filer learned of the invention from someone else, or if a prior inventor publicized the invention without filing, the first filer would not be entitled to a patent. 35 USC § 102(a)-(b), (f).

²⁹³ Mark A. Lemley & Colleen V. Chien, *Are the U.S. Patent Priority Rules Really Necessary?*, 54 HASTINGS L.J. 1299, 1304-05 (2003). *But see* Dennis D. Crouch, *Is Novelty Obsolete? Chronicling the Irrelevance of the Invention Date in U.S. Patent Law*, 16 MICH. TELECOMM. & TECH. L. REV. 53, 70 (2009) (showing that very few patent application files include affidavits asserting rights based on date of invention).

²⁹⁴ *Brenner v. Manson*, 383 U.S. 519, 534-35 (1966) (highlighting that inventor must show utility to be awarded invention in interference). One would expect that this is also true for other specification requirements, such as enablement.

²⁹⁵ Cotropia, *supra* note 253, at 76 (arguing that lax utility requirement leads to early filing).

²⁹⁶ See Phanesh Koneru, *To Promote the Progress of Useful Article[s]?: An Analysis of the Current Utility Standards of Pharmaceutical Products and Biotechnological Research Tools*, 38 IDEA 625, 627 (1998) (suggesting that timing based on utility rules affects patent applications).

minimis eligible utility has no doctrinal effect on damages: once an inventor's patent claims are deemed valid and infringed, he or she is entitled to a damage award, the amount of which may exceed the useful contribution of the patent.²⁹⁷ Past patent-reform proposals have included limitations on damages,²⁹⁸ and commentators have questioned whether such bills limit damage awards too much.²⁹⁹

Rather than amending the statute to limit damages “only to the portion of the economic value of the infringing product or process properly attributable to the claimed invention’s specific contribution over the prior art,”³⁰⁰ as early proposals stated, each of the three concepts of usefulness can be considered by courts seeking to calculate reasonable royalty damages, even without any “patent reform.”

For example, if a patent’s disclosure of the invention is questionably or barely operable, then the patentee might be entitled to a smaller royalty if infringing producers can find better ways to make that invention operable. The same principle applies to practical and commercial usefulness; inventions that had marginal practical or commercial use when conceived might become immensely practical when combined with the later work of others.³⁰¹ In such cases, the damage award to the inventor should be reduced in proportion to his or her actual contribution. If, however, the patent describes and claims an operable and sellable product, one that has a current practical use, creates new consumer demand, or lowers prices, then more damages should be awarded to reflect the greater benefit the inventor provided to society.

Usefulness helps finders of fact simplify complex questions about how important an invention is when it is part of a product that comprises many different components, for example a laptop computer, cell phone, or a car.³⁰² Patentees usually argue that such an invention is critical because the

²⁹⁷ See, e.g., Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007).

²⁹⁸ See, e.g., Patent Reform Act of 2009, H.R. 1260, 111th Cong. § 5 (2009). The America Invents Act does not include limits on damages, but they are worth discussing here because they have been proposed numerous times in the past and may be resurrected in the future. See David W. Opderbeck, *Patent Damages Reform and the Shape of Patent Law*, 89 B.U. L. REV. 127, 134-37 (2009).

²⁹⁹ See Dennis Crouch & Jason Rantanen, *Patent Reform 2009: Damages*, PATENTLYO BLOG (March 3, 2009), <http://www.patentlyo.com/patent/2009/03/patent-reform-2009-damages.html>.

³⁰⁰ H.R. 1260 § 3 (stating proposed revision to 35 U.S.C. § 284(c)(1)(C) (2006)).

³⁰¹ Cf. *Blake v. Robertson*, 94 U.S. 728, 733-34 (1877) (“But inventions covered by other patents were embraced in those machines. It was not shown how much profit was due to those other patents, nor how much of it was manufacturer’s profit.”).

³⁰² Lemley & Shapiro, *supra* note 297, at 2020; cf. Richard R. Nelson, *The Economics of Invention: A Survey of the Literature*, 32 U. CHI. J. BUS. 101, 103 (1959) (“The proportion of new elements in [an] invention is often small; a modern textile machine, for example, can be disassembled into a heap of perfectly familiar machine elements.”).

infringing product will not work without it,³⁰³ while defendants argue to the contrary that the invention is only a small piece of the whole and that redesigns would be expensive.³⁰⁴

Resolving this debate may prove impossible, but usefulness considerations would help by measuring both how useful the invention is to the end product and how much time and money it took to incorporate the invention. The more useful the invention (as compared to alternatives) in the whole product, or the less effort it took to implement as compared to the patent disclosure, the higher the damages should be.³⁰⁵ Infringers rarely copy patents.³⁰⁶ However, the teaching of the patent is relevant to determine whether the infringer could have (and perhaps should have) saved societal resources by following the patent rather than independently developing the same thing. Patents that provide little usefulness should not be rewarded because they can potentially save few resources. Patents that provide great usefulness should be rewarded, not only to incentivize the ex ante inventive activities, but also to channel potential infringers toward licenses rather than duplicative development.

Here, usefulness analysis diverges from eligible utility in three ways. First, damage analysis considers the amount of usefulness the patented component provides. Second, damage analysis considers the contribution of the patent's disclosure to the art, rather than that of just the claims. Third, and for this question most important, the inquiry considers the timing of the usefulness. An invention may have been highly useful when invented, but if it provides almost no use that is different than other, non-infringing products on the market later provide, then damages should be reduced.

Usefulness is now one of the many factors set forth in *Georgia-Pacific Corp. v. U.S. Plywood Corp.*³⁰⁷ that courts consider in assessing reasonable royalties.³⁰⁸ Instead of being diluted by other factors, it should be the most

³⁰³ Lemley & Shapiro, *supra* note 297, at 2023 (“To begin, the ‘entire market value’ rule imported from the lost profits cases will sometimes permit patentees to recover not just the value of the patented component but also other unpatented components of the product to the extent that demand for the patented piece drove sales of the whole device.”).

³⁰⁴ *See id.* at 2024 (“[Royalties on the entire market value] is the wrong standard because it allows one patentee to capture the entire value of an invention that may also be subject to claims by other patentees or based on other inputs, investments, or innovations made by the firm selling the product.”).

³⁰⁵ *See Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648 (1915) (“[I]t was permissible to show the value by proving what would have been a reasonable royalty, considering the nature of the invention, its utility and advantages, and the extent of the use involved.”); *Suffolk Co. v. Hayden*, 70 U.S. (3 Wall.) 315, 320 (1866) (“[I]n order to get at a fair measure of damages, or even an approximation to it, general evidence must necessarily be resorted to. And what evidence could be more appropriate and pertinent than that of the utility and advantage of the invention over the old modes or devices that had been used for working out similar results?”).

³⁰⁶ Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1424 (2009).

³⁰⁷ 318 F. Supp. 1116 (S.D.N.Y. 1970), *modified by* 446 F.2d 295 (2d Cir. 1971).

³⁰⁸ *Id.* at 1120.

important question. The value of a patent's contribution to society is its usefulness as compared to the prior art. While considering usefulness to the exclusion of other damages factors might seem radical, in actuality, it sharpens the damage inquiry's focus.

Most of the other *Georgia-Pacific* factors³⁰⁹ fall into two categories. The first category relates to the popularity and success of the invention. As with obviousness, these factors, such as commercial and licensing success of the patentee,³¹⁰ may be driven by inputs other than the patent's usefulness, such as expensive or highly effective advertising or market power.³¹¹ The second category relates to the invention's usefulness relative to other available products. These factors include the effect of the patented item on competing products' sales, the nature of the patented invention, and benefits of use of the invention.³¹²

Since *Georgia-Pacific*, courts have generally been instructed to disregard the effects of influences unrelated to the patent's value when considering the first category of *Georgia-Pacific* factors.³¹³ In practice, however, they find it extremely difficult to do so. Consideration of a patent's usefulness, however, complies with the instruction because usefulness analysis incorporates the value of the patent while disregarding factors unrelated to that value.

Using similar reasoning, royalties should not necessarily be based on the full sale price of a complex product, such as a cell phone, that incorporates a patented component, such as a particular antenna.³¹⁴ The usefulness of the antenna may be small in comparison to the usefulness of the infringing product, an entire phone.³¹⁵ In such cases, a royalty should be based on the cost of the component on its own and reflect the relative usefulness of the component compared to the entire complex product and non-infringing alternatives.

The fact that an infringed product is a small component of a system will not always lead to small royalties. Indeed, the most highly useful inventions may be those that have few or no alternatives but that contribute greatly to the usefulness of the infringing product. The transistor is such an

³⁰⁹ *Id.*

³¹⁰ *Id.*

³¹¹ See Lemley & Shapiro, *supra* note 297, at 2024.

³¹² *Georgia-Pacific*, 318 F. Supp. at 1120.

³¹³ See *id.* at 1136-37; see also *McNeil-PPC, Inc. v. L. Perrigo Co.*, 337 F.3d 1362, 1370 (Fed. Cir. 2003).

³¹⁴ Lemley & Shapiro, *supra* note 297, at 2023 (arguing that royalty should be based on market price of patented component rather than market price of infringing product).

³¹⁵ For example, the patented microprocessor might be substitutable for other microprocessors without significantly affecting the overall functioning of the laptop. See, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1320 (Fed. Cir. 2011) ("The Supreme Court and this court's precedents do not allow consideration of the entire market value of accused products for minor patent improvements . . .").

example; most products could not work without it, and the alternatives at the time it was patented were both more costly and less useful.

In all events, though, courts should steer clear of basing damage awards on standard royalty rates, because such rates are inaccurate and account for many factors unrelated to usefulness.³¹⁶ First, the revenue base for such royalties is often unclear or undertheorized, especially where multiple patents are licensed simultaneously.³¹⁷ Second, patent royalties are often negotiated in advance of any production or sale of the licensed product, before usefulness is fully understood and alternatives are developed. As such, licensors may overpay because they believe few alternatives to the patented product will be available, or licensees may undersell because they believe many will be available. Neither prediction accurately assesses an invention's actual usefulness in damage award calculations much later in time. To be sure, industry-standard rates might be helpful evidence to show the value of a particular component, but courts must always analyze these rates with the patent's usefulness in mind.

Third, standard royalty rates necessarily aggregate the three types of usefulness into one question. A reasonable measure of damages should consider not just the amount, but also the type of usefulness a patented invention provides. Operable usefulness might allow a product to exist where one was impossible before; the laser in CD-ROM technology is a good example, because compact discs are useless (except as coasters) without a laser to read them.

Practical usefulness might provide a public benefit where none was available before; a new circuit design might make network communications faster, allowing the public to obtain data more quickly. While the faster communications may be practically useful for both the infringer and society, some practical usefulness would not entitle a patent holder to the amount of royalties that a new operable usefulness might deserve. Improvement is simply worth less than a completely new benefit to society—compare a faster network connection with the invention of the first router, for example.

Finally, a new manufacturing method might become commercially useful by driving production costs down, allowing producers to offer their products at a lower price or to capture more profit. The type of royalty awarded that accounts for this type of usefulness might not be tethered to revenues. Instead, a court might base the royalty on manufacturing costs or profit margins.

Thus, parties' discovery and research into the relevant industry should focus not only on licenses others have reached, but also on manufacturing costs, alternative components, product supply and demand, and design documentation and alternatives. This inquiry would certainly make economic

³¹⁶ *Cf. id.* at 1315 (rejecting 25 percent license-fee rule of thumb).

³¹⁷ *See* Lemley & Shapiro, *supra* note 297, at 2024.

damage experts' work harder, but at typical consulting rates, they have little excuse for not earning their pay.

In short, the courts that permit shoddy economic analysis are as guilty for perpetuating the damage crisis and drive for patent reform as faulty legal rules are. While much of damage doctrine implicitly incorporates usefulness in theory, it fails to do so in practice. If the role of usefulness in damage calculations were expanded and made explicit, damage awards would be more accurate, and the legal system would provide more appropriate incentives.

Usefulness might even be included in equitable remedies determinations. While the hardships considered by courts applying the equitable-remedy test are associated with the parties rather than with the patent, usefulness could inform the court about such hardships. The more useful an invention, the less the infringer might have been willing to spend to implement it, such that the balance of harm upon infringement tips toward the patentee. On the other hand, marginally useful patents might require additional implementation investment by the infringer that would be lost if the court awarded an injunction; the balance of harms would favor the infringer. Usefulness considerations help inform disputes about which types of infringement should be enjoined.

CONCLUSION

From a broad perspective, this Article illustrates how patent law is a complex combination of important values. The rules do not exist in vacuums, separate from each other; each requirement works in conjunction with the others, and none of them cannot be properly understood without considering its interaction with the others.

Usefulness, an old yet neglected patentability consideration, is one of the most important of these requirements, weaving through many different doctrinal areas. It is not just an eligibility tool; it also helps to answer difficult questions of patentability. Considering an invention's usefulness can help resolve novelty, obviousness, subject matter, enablement, claim scope, and damages questions.

As such, usefulness can be a principled driver of patent policy. Cases like *Bilski*, *Metabolite*, *KSR*, and even *Incandescent Lamp*, have left courts and commentators puzzled about how to practically implement their generalized guidance about patentable subject matter, obviousness, and enablement. Usefulness considerations put meat on the bare bones of statutory and Supreme Court guidelines. While each of these areas must stand on its own, usefulness shows how they are related and why they are important, and it allows courts to interpret and to apply them in a more principled way.