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## Reinventing Usefulness

Michael Risch

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## Reinventing Usefulness

*Michael Risch\**

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#### ABSTRACT

*Patent law includes one of this country’s oldest continuous statutory requirements: since 1790, and without variance, inventors are entitled to patent only “new and useful” inventions. While “newness” receives constant attention and debate, usefulness has been largely ignored. Usefulness has transformed into the toothless and misunderstood “utility” doctrine, which requires that patents only have a bare minimum potential for use.*

*This Article seeks to reinvent patentable usefulness. It is the first comprehensive look at usefulness and it reasons that a core benefit of the requirement is to aid in the commercialization of inventions. The Article then proposes two ways that usefulness can be used to achieve this goal.*

*First, it justifies a current but controversial doctrinal rule: that an invention must have practical usefulness to be patented. Second, it suggests a new rule, that inventions must have commercial usefulness to be patented.*

*Finally, the Article concludes with a discussion of the potential costs and benefits of usefulness and discusses future areas of research that would support this Article’s proposal.*

#### I. INTRODUCTION

Patent law includes one of this country’s oldest continuous statutory requirements: since 1790, and without variance, inventors are entitled to patent only “new and useful” inventions.<sup>1</sup> While

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1. 35 U.S.C. § 101 (2000) (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement

“newness” receives constant attention and debate, usefulness has been largely ignored. Usefulness has transformed into the toothless and misunderstood “utility” doctrine, which requires that patents only have a bare minimum potential for use. Thus, it may not be surprising that at least half of all patents are worthless,<sup>2</sup> yet the Patent Office continues to issue virtually useless patents like the “Dining Table Having Integral Dishwasher”<sup>3</sup> or the “Feminine Undergarment with Calendar.”<sup>4</sup>

Despite the social costs of granting useless patents, usefulness has previously remained both doctrinally and normatively undertheorized.<sup>5</sup> Consequently, usefulness is underused as a patent policy lever.<sup>6</sup> The critical role that usefulness should—but currently fails to—play in the patent system warrants a critical and inventive examination.

This Article seeks to reinvent patentable usefulness. It is the first comprehensive look at usefulness, and it reasons that a core benefit of the requirement is to aid in the commercialization of inventions. The Article then proposes two ways that usefulness can be used to achieve this goal.

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thereof, may obtain a patent therefor . . . .”); Patent Act of 1790, ch. 7, § 1, 1 Stat. 109–12 (Apr. 10, 1790) (repealed 1793).

2. Kimberly A. Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521, 1526 (2005) (“[T]his empirical study has found that 53.71% of all patentees do allow their patents to expire for failure to pay one of their maintenance fees.”). Presumably there are many worthless patents for which maintenance fees are paid. Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 362 (2010) (“As an empirical matter, it appears that less, probably much less, than half of all patented product inventions are commercialized.”).

3. U.S. Patent No. 5,687,752 (filed Nov. 15, 1995).

4. U.S. Patent No. 5,606,748 (filed Jan. 29, 1996).

5. See Rebecca S. Eisenberg & Robert P. Merges, *Opinion Letter as to the Patentability of Certain Inventions Associated with the Identification of Partial cDNA Sequences*, 23 AIPLA Q.J. 1, 4 (1995) (“One source of difficulty in defining the content of the utility requirement is a lack of clarity as to its underlying purposes.”); Phanesh Koneru, *To Promote the Progress of Useful Art[icle]s?: An Analysis of the Current Utility Standards of Pharmaceutical Products and Biotechnological Research Tools*, 38 IDEA 625, 641 (1998) (“It is noteworthy that economists, though interested in the study of utility and efficiency of social arrangements, have not sufficiently focused their attention on the utility requirement in the patent law.”); Note, *The Utility Requirement in the Patent Law*, 53 GEO. L.J. 154, 156 (1964) [hereinafter *Utility Requirement*] (“The unfortunate result . . . has been confusion as to the meaning and purpose of the constitutional requirement of utility in invention.”).

6. DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* 110–11 (2009) (noting underuse of utility as a policy lever).

First, it justifies a current but controversial doctrinal rule: that an invention must have practical usefulness to be patented. Second, it suggests a new rule, that inventions must have commercial usefulness to be patented.

There is no dispute that a patent must be “useful,” yet no single word in the Patent Act has spawned so many meanings in different contexts; some of the confusion may simply stem from its shorthand designation: “utility.” While utility can mean usefulness, it can mean many other things as well. Economists refer to utility as a measure of social welfare. Designers refer to utility as functionality. Governments refer to utility as a public service provider. Baseball players and knife manufacturers refer to utility as multi-use. Farmers refer to utility as a type of livestock. Computer users refer to utility as a type of software program.

Each of these definitions of utility might possibly apply to some inventions, but they are not generalized. Thus, though this Article adopts “utility” as a workable synonym, its focus is on usefulness.

Part II describes three possible conceptions of usefulness that generally apply to inventions. First, inventions might be *operable*: current doctrine requires that inventions achieve their disclosed purpose. Second, inventions might be *practically useful*: doctrine requires a specific, substantial, and immediate benefit to the public. Third, inventions might be *commercially useful*: while inventions must promise some public benefit, the law does not currently require readiness for distribution or even any commercial appeal. Thus, applicants must currently satisfy both the operable and practical usefulness requirements, and this Article suggests that commercial usefulness should be incorporated into doctrine as well.

Part III examines the measurement of usefulness. The *type* of usefulness measured is important. For example, the different conceptions are often treated as a single requirement. As a result, the primary literature focuses on the *amount* of utility rather than the *type* of utility an invention delivers. This leads to seemingly contradictory—but doctrinally consistent—outcomes. For example, marginally useful inventions like calendar underwear are patentable, while some potentially very useful pioneering medical treatments are

not because their effectiveness has not yet been established.<sup>7</sup> Understanding why allows for better consideration of whether usefulness requirements should be varied in order to achieve commercialization goals.

Part IV looks at one usefulness requirement already targeted toward commercial goals—practical utility. Practical utility is often criticized as privileging mechanical inventions over chemical inventions, and it does to some extent. There is no dispute that patent policy favors applied science over basic science. However, this favoritism serves the important purpose of incentivizing development of commercially valuable chemicals. Chemicals that have no known purpose help the public little, and granting patents only when a purpose is discovered might shift limited resources toward discovering how new chemicals might benefit society.

Of course, practical utility does little to resolve the apparent paradox that a worthless mechanical invention is still patentable because it has some practical use. Part V proposes commercial utility as a new patentability requirement designed to more directly incentivize activities that result in commercially useful inventions. In short, this Article concludes that practical usefulness is insufficient— inventions should not be considered complete and patentable until there is reason to believe that they can be produced at a cost that consumers are willing to pay.

This two-part doctrinal test draws on the intersection of supply and demand that leads to a market clearing price. In that sense, commercial utility comes closest to the economic definition of utility, here measured by consumer surplus—the difference between what buyers are willing to pay and the price they actually pay, usually the production cost of the item. Commercial utility seeks to ensure that inventions are worth more to the public than they cost.

The commercial utility element proposed here offers certain social benefits but comes with some social costs not reflected in consumer surplus. At its best, it provides the benefit of channeling inventive activity toward commercially valuable products and

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7. See, e.g., *In re '318 Patent Infringement Litig.*, 583 F.3d 1317, 1325–26 (Fed. Cir. 2009) (prophetic use of galantamine to treat Alzheimer's disease was not useful where applicant failed to provide evidence that such treatment would be effective); *Rasmusson v. SmithKline Beecham Corp.*, 413 F.3d 1318, 1325 (Fed. Cir. 2005) (patent denied for beneficial cancer treatment because inventor filed before he could prove it worked).

services. It also has the benefit of limiting claim scope, as some broad but non-specific claims are less likely to be commercially viable. Yet the costs might include delaying the patenting of pioneering claims, thereby diminishing rewards for such inventions and decreasing incentives to pursue them. The effect of such social benefits and costs depends on the goals of the patent system and estimates about how important patenting is to different types of inventive activity. This part concludes by offering some possible avenues for future research that address benefit and cost questions arising from implementing commercial utility.

## II. THREE CONCEPTIONS OF UTILITY

The usefulness requirement arguably stems from the Constitution, as Congress may only create laws granting exclusive rights “[t]o promote the progress of . . . useful arts.”<sup>8</sup> Some have argued that the constitutional mandate bars patents on non-useful inventions,<sup>9</sup> but this may be an overstatement. A plausible contrary interpretation is that “useful arts” was itself a term of art that distinguished the trades from science,<sup>10</sup> such that non-useful inventions might be protected so long as they are part of the useful arts.

Nonetheless, Congress has always considered usefulness a requirement; the Patent Act has protected only “useful” inventions since 1790.<sup>11</sup> This single word provides little guidance, as the Supreme Court points out: “As is so often the case, however, a simple, everyday word can be pregnant with ambiguity when applied to the facts of life.”<sup>12</sup>

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8. U.S. CONST. art. 1, § 8, cl. 8.

9. Maurice W. Levy, *Utility—The Inverted Criterion*, 30 J. PAT. OFF. SOC’Y 592, 592–93 (1948).

10. 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. INTEL. PROP. L. 1, 52 (1994) (“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.”).

11. Patent Act of 1790, ch. 7, § 1, 1 Stat. 109–12 (1790) (repealed 1793); 35 U.S.C. § 101 (2006).

12. *Brenner v. Manson*, 383 U.S. 519, 529 (1966).

Courts must interpret the term despite these difficulties and have done so<sup>13</sup> by linking usefulness to “utility.” Most scholars attribute modern utility doctrine to an 1817 opinion by Justice Story, riding circuit, in the first case to discuss utility in detail, *Lowell v. Lewis*.<sup>14</sup> However, a more complete theoretical kernel appears in another Story opinion issued a few months later in *Bedford v. Hunt*<sup>15</sup>:

By useful invention, in the statute, is meant such a one as may be applied to some beneficial use in society, in contradistinction to an invention, which is injurious to the morals, the health, or the good order of society. It is not necessary to establish, that the invention is of such general utility, as to supersede all other inventions now in practice to accomplish the same purpose. It is sufficient, that it has no obnoxious or mischievous tendency, that it may be applied to practical uses, and that so far as it is applied, it is salutary. If its practical utility be very limited, it will follow, that it will be of little or no profit to the inventor; and if it be trifling, it will sink into utter neglect. The law, however, does not look to the degree of utility; it simply requires, that it shall be capable of use, and that the use is such as sound morals and policy do not discountenance or prohibit.<sup>16</sup>

In this short quotation, Justice Story introduces three distinct conceptions of usefulness: operable, practical, and commercial (including moral) usefulness. These are not the only possible conceptions, but their historical source and their continued relevance provide a conceptual framework for understanding and applying the usefulness requirement.

Currently only operability and practicality are required; commerciality is not.

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13. Donald L. Zuhn, Jr., Comment, *DNA Patentability: Shutting the Door to the Utility Requirement*, 34 J. MARSHALL L. REV. 973, 984 (2001) (“Inventors have had to rely instead on the interpretations of the term ‘useful’ as provided by the federal courts . . .”).

14. 15 F. Cas. 1018, 1019 (C.C.D. Mass. 1817).

15. 3 F. Cas. 37 (C.C.D. Mass. 1817).

16. *Id.* at 37.



*A. Operable Usefulness*

Operable usefulness requires that a patented invention must actually achieve some intended result. This category comes from *Bedford's* requirement that an invention “shall be capable of use.”<sup>17</sup>

Thus, modern operable utility requirements exclude three types of inoperable inventions:

1. *Impossible inventions*: Inventions that violate the laws of nature—most notoriously perpetual motion machines<sup>18</sup>—are considered inoperable.

2. *Prophetic inventions*: Inventions that *could* work, but that someone familiar with the subject matter would view as unworkable, are considered inoperable absent some evidence to the contrary.<sup>19</sup> Untested pharmaceuticals often fall under this category.

3. *Incompletely disclosed inventions*: Inventions that cannot be implemented by following the patent's teachings are considered inoperable.<sup>20</sup> This typically arises where the inventor has left details out of the patent specification or where the claimed invention could not work as described. Failure may occur due to inadvertent drafting error or due to the inventor's misunderstanding of the purported invention. This category differs from the other two because the achievement of the invention is believable even if the inventor has not described a successful result.<sup>21</sup>

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17. *Id.*

18. *See, e.g.*, *Newman v. Quigg*, 877 F.2d 1575 (Fed. Cir. 1989); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 706.03(a) (8th ed. rev. 2010) (“A rejection on the ground of lack of utility includes the more specific grounds of inoperativeness, involving perpetual motion.”).

19. *See Rasmusson v. Smithkline Beecham Corp.*, 413 F.3d 1318, 1318 (Fed. Cir. 2005).

20. *Process Control Corp. v. Hydreclaim Corp.*, 190 F.3d 1350, 1359 (Fed. Cir. 1999) (claim language leads to “nonsensical result”); *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571 (Fed. Cir. 1992).

21. Unsurprisingly, this type of operability is closely related to Section 112's enablement requirement that requires an applicant to disclose how to make an invention. 35 U.S.C. § 112 (2000); *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.”).

*B. Practical Usefulness*

The practical usefulness prong can be traced to *Bedford's* teaching that “[i]t is sufficient . . . that [the invention] may be applied to practical uses . . . .”<sup>22</sup> The modern practical utility requirement was announced by the Supreme Court in 1966; *Brenner v. Manson*<sup>23</sup> ruled that inventions must have some currently available specific and substantial use to satisfy § 101’s “useful” requirement.<sup>24</sup> *Brenner* also ruled that processes that make “useless” products also lack practical utility.<sup>25</sup>

Practical utility is also reflected in § 112, which requires inventors to disclose how to use an invention.<sup>26</sup> If there is no use for the invention, then the inventor cannot comply with § 112’s “how to use” requirement.<sup>27</sup>

There are many inventions that are useful, but only for further study. These inventions are treated as being practically useless. For example, the law denies patents on compositions of matter with no currently known use, but with a potential use that might be revealed after further experimentation. When such use is revealed, the composition would have patentable practical utility.

Not all inventions have the potential for practical use, though. Some types of inventions will never exhibit practical utility. These inventions, like the pet rock, fail to “do something” no matter how much they are studied.<sup>28</sup>

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22. *Bedford v. Hunt*, 3 F. Cas. 37, 37 (C.C.D. Mass. 1817); *see also Many v. Jagger*, 16 F. Cas. 677, 682 (C.C.N.D.N.Y. 1848) (“The new idea must be reduced to some practical use before it can become the subject of a patent . . .”).

23. 383 U.S. 519 (1966).

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

25. *Id.* at 535.

26. 35 U.S.C. § 112.

27. *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.”). The role of usefulness in patent disclosures related to section 112 will be addressed in a future article.

28. Michael Risch, *Everything is Patentable*, 75 TENN. L. REV. 591, 634 (2008).

*C. Commercial Usefulness*

A third concept arising from *Bedford v. Hunt* is the commercial usefulness of the invention. *Bedford* ruled that an invention need not “supersede all other inventions now in practice”<sup>29</sup> or even be commercially useful<sup>30</sup> at all.<sup>31</sup> This is a *laissez faire* approach to commercially viable innovation.

The beneficial or “moral” utility requirement discussed in *Bedford* is an included part of the commercial usefulness conception. Justice Story’s early opinions required that “the invention should not be frivolous or injurious to the well-being, good policy, or sound morals of society.”<sup>32</sup> Though nominally grounded in morality, history has revealed a link to commerce. In essence, patents were disfavored in areas where courts desired to limit commercial innovation. Thus, inventions that change the appearance but not the function of products were not useful,<sup>33</sup> gambling machines were considered non-beneficial,<sup>34</sup> and courts debated the utility of guns, eventually allowing them.<sup>35</sup>

Modern cases further support this Article’s assertion that moral utility is part of commercial usefulness. For example, a prominent Federal Circuit opinion rejected a moral utility challenge by describing the commercial appeal of several inventions designed to

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29. *Bedford v. Hunt*, 3 F. Cas. 37, 37 (C.C.D. Mass. 1817).

30. Because it is not required to sustain a patent, “commercial usefulness” is doctrinally undefined. This Article later suggests that a commercially useful invention can be manufactured at a cost that a sufficient number of buyers will pay to form a market.

31. See *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.”); *Bell v. Daniels*, 3 F. Cas. 96, 98 (C.C.S.D. Ohio 1858) (finding that invention must be completely worthless to be invalidated in utility grounds); *Shaw v. Colwell Lead Co.*, 11 F. 711, 715 (C.C.S.D.N.Y. 1882); 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.”).

32. *Lowell*, 15 F. Cas. at 1019.

33. See *Scott & Williams, Inc. v. Aristo Hosiery Co.*, 7 F.2d 1003 (2d Cir. 1925) (finding that false seam on seamless stocking is unpatentable); *Rickard v. Du Bon*, 103 F. 868 (2d Cir. 1900) (finding that invention that made tobacco leaves appear spotted is unpatentable).

34. *Brewer v. Lichtenstein*, 278 F. 512 (7th Cir. 1922); *Schultze v. Holtz*, 82 F. 448 (C.C.N.D. Cal. 1897).

35. *Fuller v. Berger*, 120 F. 274, 275–76 (7th Cir. 1903).

deceive others.<sup>36</sup> Further, because gambling is legal in several states (and thus commercially acceptable), gambling devices are now considered beneficially useful.<sup>37</sup>

In short, because commercial utility is not required, moral utility is essentially ignored today;<sup>38</sup> courts instead apply the *laissez faire* attitude generally applicable to commerciality and have stopped making judgments about what is “good” for society. Instead, they allow the market to decide which inventions are morally acceptable and leave false advertising laws to remedy over-promised usefulness.<sup>39</sup> Nonetheless, some people still advocate using commercial usefulness standards to limit patentability. They argue that controversial technologies should be unpatentable to disincentivize their commercial development.<sup>40</sup> Indeed, some technologies are statutorily barred from patentability, such as nuclear weapons.<sup>41</sup>

Proposed limits based on commercial use have not taken hold; while practical and operable utility might require the potential for commercial usefulness in some cases, the other conceptions are not effective substitutes because they do not require any real likelihood that consumers will pay for the invention. Because no patentability requirement effectively regulates the commercial appeal of inventions, it is no wonder that commercially useless patents routinely issue.

Three critical assumptions underlie normative justifications for the current lack of a commercial usefulness requirement. First, justifications for ignoring commerciality assume that commercial appeal depends on the eye of the beholder; there may be commercial value in inventions that are inferior to existing products, such as

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36. *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1367 (Fed. Cir. 1999).

37. *Ex parte Murphy*, 200 U.S.P.Q. 801, 803 (P.T.O. Bd. App. 1977) (citing *Fuller*, 120 F. at 275) (explaining that moral utility requires invention to be devoid of any beneficial use at all).

38. See BURK & LEMLEY, *supra* note 6, at 111.

39. *Juicy Whip*, 185 F.3d at 1368 (“The requirement of ‘utility’ in patent law is not a directive to the Patent and Trademark Office or the courts to serve as arbiters of deceptive trade practices. Other agencies, such as the Federal Trade Commission and the Food and Drug Administration, are assigned the task of protecting consumers from fraud and deception in the sale of food products.”).

40. Leanne M. Fecteau, *The Ayahuasca Patent Revocation: Raising Questions About Current U.S. Patent Policy*, 21 B.C. THIRD WORLD L.J. 69, 89–90 (2001).

41. 42 U.S.C. § 2181(a) (2000).

cheaper manufacturing or the ability to charge less for inferior quality. This assumption seems reasonable. Second, they assume that commerciality is best measured after the fact because it is difficult to measure commercial usefulness *ex ante*; instead, the market best decides whether an invention is commercially useful.<sup>42</sup> Third, they assume that issuing commercially useless patents is costless; theoretically, only the patentee is harmed if the patent has no commercial value. The latter two assumptions may not survive scrutiny as discussed further in Part IV.

### III. MEASURING USEFULNESS

Usefulness cannot be used as a commercialization tool without understanding how and when it should be measured. For example, many misunderstand how the different conceptions of usefulness relate to the amount of utility required for patentability. Further, the timing of the inquiry is of critical, but understudied, importance. Quantity, category, and timing shape the remainder of this Article's proposals. A new commercial usefulness requirement will be ineffective if it is unclear how and when such usefulness will be measured.

#### *A. Quantity v. Category*

It is important to distinguish between the amount of utility required and the type of utility required. Failure to distinguish the two makes it difficult to rigorously assess the effect of each of the utility conceptions on commercialization (or any other goal of the patent system).

This Article concludes that quantity should not be measured, but that each type of utility must be present before the invention is complete. Thus, a patent must satisfy *each* required type of usefulness, but only through a *de minimis* showing. This rule allows for each conception of utility to achieve its purpose without imposing high measurement costs on patent examiners and courts.

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42. Koneru, *supra* note 5, at 649 (“Because the patent grant is a means, not a guarantee, to achieve commercial gains, the basic *quid pro quo* is best determined by the market place, not by the patent office. An inventor creates his own reward, which is directly dependent on the invention's contribution to the society.”).

*1. Quantity*

Each conception of usefulness should be judged on a de minimis basis; any quantity of utility should suffice. This is, for the most part, the current state of the law, and the best rule in any event. It may seem odd that usefulness should be judged using a pass/fail standard, and that no court has attempted to define a threshold degree of utility. Because the allure of measuring the degree of utility is apparent, it would be satisfying to only allow patents for really useful inventions and to deny protection of mostly useless inventions. Indeed, earlier versions of the Patent Act required inventions to be “sufficiently useful and important,”<sup>43</sup> implying that Congress may have intended such a measurement of utility.

In practice, however, limiting patents to those that meet a pre-determined degree of utility would likely be too costly and unworkable.<sup>44</sup> Examiners lack the expertise and time to measure the degree of practical use of a chemical or machine, especially during patent examination before the product has been brought to market. Further, courts are ill-suited to determine that an invention works “well enough.” More generally, requiring usefulness on an analog or probabilistic scale would require expertise and unquestioned discretion by the PTO, normative judgments by judges and juries, and far too much pre-filing research by patentees.<sup>45</sup> Furthermore, many inventions have only marginal usefulness when created, but become incredibly useful in the future.<sup>46</sup> Finally, different consumers may want different degrees of usefulness at different costs.<sup>47</sup>

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43. Patent Act of 1836, ch. 357, § 7, 5 Stat. 117, 120 (1836) (repealed 1870). See Part IV for further discussion of this provision.

44. Cherylyn A.P. Esoy, Comment, *The PTO's 2001 Revised Utility Examination Guidelines For Gene Patent Applications: Has the PTO Exceeded the Scope of Authority Delineated by the Court's Interpretation of a "Useful" Invention?*, 33 SETON HALL L. REV. 127, 157 (2002) (discussing costs associated with determining a degree of utility).

45. *Ex parte* Cheesebrough, 1869 Dec. Comm'r Pat. 18, 19 (1869) (“[The Patent Office] can only see that the purpose proposed, if accomplished, would be useful . . . . Beyond this it can only oppose the opinion of man to man—an opinion by which, if all our great inventions had been tried when first presented to the office or the public, the great majority of them would have been strangled at birth by the unfriendly hand of adverse criticism.”).

46. Polypropylene, one of the most important inventions of the twentieth century, was not useful at the time of the 1954 patent filing. *E.g.*, *In re* Ziegler, 992 F.2d 1197, 1203 (Fed. Cir. 1993) (holding that the patent applicant “did not assert any practical use for the polypropylene” and “did not disclose any characteristics of the polypropylene . . . that demonstrated its utility”); see also Brent Nelson Rushforth, *The Patentability of Chemical Intermediates*, 56 CALIF. L. REV. 497, 510–12 (1968) (“Other inventions may possess only

Instead, the test should be whether one skilled in the art believes that some *de minimis* utility is present with respect to each of the applicable conceptions. Such a yes/no test leaves utility in good company because all of the other requirements of patentability are similar. A claimed invention is either known in the prior art, or it is not;<sup>48</sup> a specification either enables one to make an invention, or it does not;<sup>49</sup> and a claim is either definite, or it is not.<sup>50</sup> Even non-obviousness, though highly context specific, yields a single answer: one does not ask *how* obvious the invention was, only that it was obvious.<sup>51</sup>

## 2. *Category*

The conceptions of usefulness usually encompass each other. If something is commercially useful, then it usually follows that it is also practically useful and operable. Even if commercial utility is not considered, practical usefulness usually entails operability.

In the general case where the conceptions overlap, a single *de minimis* level utility will suffice. If, however, one of the conceptions is satisfied while the others are not, then usefulness must be considered for each category. Thus, an invention may operate as designed, even if there is no practical use for it (such as the process for making an unknown-use chemical). This is not the only combination; an invention might be practically useful and still be inoperable for the intended purpose. For example, a claimed perpetual motion machine might be practically useful as an energy generator, but inoperable because it could not achieve 100% efficiency. Indeed, some inventions might be highly commercially useful despite lacking operable or practical utility. For example, the

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minimal utility at the time of the granting of the patent and later become extremely valuable to the public and to the patentee through the later development of new and unpredictable uses.”).

47. Rushforth, *supra* note 46, at 512.

48. 35 U.S.C. § 102 (2006).

49. 35 U.S.C. § 112 ¶ 1 (2006); *but see* Tun-Jen Chiang, *The Levels of Abstraction Problem in Patent Law*, 105 Nw. L. Rev. (forthcoming 2011) (arguing that enablement is a non-precise standard), *available at* [http://www.law.gmu.edu/assets/files/publications/working\\_papers/0933LevelsofAbstraction20090714.pdf](http://www.law.gmu.edu/assets/files/publications/working_papers/0933LevelsofAbstraction20090714.pdf).

50. 35 U.S.C. § 112 ¶ 2.

51. 35 U.S.C. § 103 (2006).

pet rock has no use without its packaging and marketing.<sup>52</sup> An extreme example might be the “Bag O’ Glass” made famous by Dan Akroyd on Saturday Night Live.<sup>53</sup>

### 3. *Confusing quantity and category*

Perhaps the most confused discussion in utility doctrine is the “amount” of usefulness that should be required for patentability. Debate on this question has befuddled scholars<sup>54</sup> and courts alike. The splintered *In re Kirk*<sup>55</sup> opinion exemplifies this confusion. The application at issue claimed several steroid compounds with no known therapeutic use.<sup>56</sup> The majority rejected the claims because the only evidence of use set forth by the applicant was a statement that the steroids showed “biological activity.”<sup>57</sup> Judge Rich disagreed and detailed his interpretation of utility doctrine<sup>58</sup> to argue that only de minimis utility is required for patentability and that “biological

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52. See *McClain v. Ortmayer*, 141 U.S. 419, 428 (1891) (“That the extent to which a patented device has gone into use is an unsafe criterion, even of its actual utility, is evident from the fact that the general introduction of manufactured articles is as often effected by extensive and judicious advertising, activity in putting the goods upon the market, and large commissions to dealers, as by the intrinsic merit of the articles themselves.”). The author could not locate any patent claiming the pet rock. See, e.g., *Method for Forming a Decorative Novelty Device*, U.S. Patent No. 4,082,871 (filed Jan. 5, 1977) (claiming a process for making a novelty rock, but not claiming the rock itself); Virtual Pet Home Page, Pet Rock Page, <http://www.virtualpet.com/vp/farm/petrock/petrock.htm> (last visited Oct. 13, 2010) (no patent on the pet rock).

53. Consumer Probe, *Saturday Night Live Transcripts*, Season 2, Episode 10, <http://snltranscripts.jt.org/76/76jconsumerprobe.phtml> (last visited Oct. 13, 2010) (“We’re just packaging what the kids want! I mean, it’s a creative toy, you know? If you hold this up, you know, you see colors, every color of the rainbow! I mean, it teaches him about light refraction, you know?”).

54. See J. Timothy Meigs, *Biotechnology Patent Prosecution in View of PTO’s Utility Examination Guidelines*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 451, 464–65 (2001) (mixing discussion of “nebulous” practical utility with minimal “threshold” of utility); see also *id.* at 470–71 (mixing operable and practical utility); 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, 290 (1996) (“This threshold view of the required utility was later explicitly rejected [in *Brenner*].”).

55. 376 F.2d 936 (C.C.P.A. 1967).

56. *Id.* at 937–38.

57. *Id.* at 941 (“It seems to us that the nebulous expressions ‘biological activity’ or ‘biological properties’ appearing in the specification convey no more explicit indication of the usefulness of the compounds and how to use them than [a prior rejected patent].”).

58. *Id.* at 950–53 (Rich, J., dissenting).



activity” was a sufficient showing, as was potential use for further research.<sup>59</sup>

However, each side addressed a different issue, which causes apparent confusion. The majority ruled that there was *no* utility in a *particular* category, namely practical utility.<sup>60</sup> The dissent essentially argued that *any* utility in *any* category is sufficient, even if there is no practical benefit to the public.<sup>61</sup> The confusion is compounded by the court’s doctrinal disagreement about whether “future study” is sufficient to satisfy practical utility.<sup>62</sup> Furthermore, neither opinion discusses, nor is it easy to discern, how a steroid with no known use can be operable.

Confusion caused by failing to differentiate the conceptions of usefulness is not limited to case law. For example, one commentator argues that games need show only minimal utility (entertainment), while therapeutic compounds are subjected to heightened requirements (efficacy).<sup>63</sup> The commentator confused categories in making the argument; the question is about two different types of usefulness. Whether games can be used for entertainment is a question of practical utility, which is easy to discern. However, whether therapeutic drugs are effective is a question of operable utility, which may be difficult to discern and thus requires additional evidence.

The inevitable result is that the utility standard appears to favor some technologies over others.<sup>64</sup> Where it is difficult to measure utility, such as the operability of therapeutics, then it will appear that the operable utility test is biased against therapeutics. Where usefulness is associated with further research, such as the discovery of

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59. *Id.* at 949 (Rich, J., dissenting). As the discussion in the next section shows, the history of utility requirements is not as clear as Judge Rich implies.

60. *Id.* at 944–45 (majority opinion) (“There can be no doubt that the insubstantial, superficial nature of vague, general disclosures or arguments of ‘useful in research’ or ‘useful as building blocks of value to the researcher’ was recognized, and clearly rejected, by the [*Brenner v. Manson* decision].”).

61. *Id.* at 949 (Rich, J., dissenting) (“I believe, as hereinafter stated, that usefulness, to chemists doing research on steroids, *as* intermediates to make other compounds they desire to make is sufficient.”).

62. *Id.* (characterizing *Brenner*’s practical utility requirement as dicta).

63. Nathan Machin, *Prospective Utility: A New Interpretation of the Utility Requirement of Section 101 of the Patent Act*, 87 CALIF. L. REV. 421, 426, 433–34 (1999).

64. BURK & LEMLEY, *supra* note 6, at 112 (arguing that standard for utility is “substantially higher” in chemical and life sciences).

new chemical compounds, then it will appear that the practical utility test is biased against basic science.

However, these apparent biases are no different than in other patentability criteria. For example, prior art may be difficult to find for computer software inventions. Such difficulties do not mean that novelty is biased in favor of software, but only that evidence is more costly to obtain to reject software claims. Similarly, utility is not biased; it is just that equal application may be harder to prove in some fields.<sup>65</sup>

Understanding the category/quantity distinction clarifies much of the doctrinal and scholarly confusion. Under this rubric, the debate in *Kirk* is resolved; because Kirk could not describe how the claimed steroid might be used, the claim lacked practical utility. Further, the inventor could not show operability because the “biological activity” was too vague to show potential therapeutic effects. Based on a complete lack of utility in both categories, the invention was unpatentable. While the dissent was correct that a de minimis amount of utility was required, it was incorrect in assuming that this amount had been satisfied. Neither generalized biological activity nor further research was the type of utility that could satisfy the minimal threshold.

### *B. Timing is Important*

While inventors can file a patent application without building the invention, they cannot do so without determining its use.<sup>66</sup> Where no use has been discovered, the law considers the invention

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65. See Alfred W. Vibber, *Utility—A Requisite in Reduction to Practice*, 30 J. PAT. OFF. SOC'Y 773, 781–82 (1948) (“It may be that it would be desirable in reduction to practice in the chemical field to relax somewhat under certain circumstances the rigorous requirements for the proof of utility, but there is no doubt that as the law now stands an inventor must meet the same tests as regards utility in the chemical field that he does in the mechanical field.”).

66. *Bogoslowsky v. Huse*, 142 F.2d 75, 76–77 (C.C.P.A. 1944) (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. & TRADEMARK 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, Editorial 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).

incomplete and unpatentable, even if a patent application has been filed.<sup>67</sup>

For example, several companies sought patents on gene fragments before they knew what function the genes performed. Scholars and courts have debated whether such fragments have patentable utility,<sup>68</sup> and the Federal Circuit recently held that such fragments lacked practical utility.<sup>69</sup> The ruling will delay the filing of such claims. If, on the other hand, practical utility requirements were eased to allow patenting of DNA fragments, then claims would be filed earlier.<sup>70</sup> This example demonstrates that timing is critically important to utility's role as a policy lever.<sup>71</sup>

Furthermore, *every claim* must be useful to be a complete invention. While a few embodiments described in a patent application might be useful, the broader concepts envisioned by the patent might lack one of the categories of utility. For example, a claim may be so broad that it covers primarily inoperable embodiments. Thus, in *The Incandescent Lamp Patent*,<sup>72</sup> the Supreme Court invalidated a patent claiming all fibrous filaments in light bulbs where some filaments worked, but most filaments were inoperable.

Thus, varying the type or amount of usefulness required can vary the timing and breadth of patent filings,<sup>73</sup> and, in turn, can

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67. See, e.g., *In re Ziegler*, 992 F.2d 1197, 1203 (Fed. Cir. 1993) (Polypropylene, one of the most important inventions of the 20th century, was not useful at the time of the 1954 patent filing).

68. *In re Fisher*, 421 F.3d 1365, 1378 (Fed. Cir. 2005) (discussing the concern that “allowing . . . patents without proof of utility would discourage research, delay scientific discovery, and thwart progress in the ‘useful Arts’ and ‘Science’”).

69. *Id.* at 1379.

70. Paul H. Eggert, *Uses, New Uses and Chemical Patents—A Proposal*, 51 J. PAT. & TRADEMARK OFF. SOC'Y 768, 781 (1969) (“There are several incentives to early patent application including the first inventor's absolute control of the compound . . . ; the necessity of, and the potential difficulties in, securing rights to a patented compound should a new use be found; and the potential profit realizable from sales to others for uses never contemplated . . . [I]n their own self-interest and for their own protection, inventors must apply as soon as possible, often before any real commercial use is found.”).

71. Eisenberg & Merges, *supra* note 5, at 6 (“One plausible reading of this opinion is that the utility requirement serves a timing function . . .”).

72. 159 U.S. 465, 472–73 (1895).

73. See Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 75–76 (2009) (arguing that requiring an inventor to find a “commercially beneficial use” for an invention, supported by appropriate data, would address the early filing problem caused by the current lax utility requirement).

profoundly affect races to the patent office.<sup>74</sup> This applies even if the patent system were reformed to grant patents to the first to file an application, because the first filer is not entitled to priority if no use is established at the time of filing.

Patent timing can have significant effects on commercialization, and this Article's proposals would be incomplete without the consideration of timing.

*1. Distinguishing non-useful inventions from potentially useful inventions*

Some inventions will never be useful, while others are simply not useful at the time of invention. Distinguishing between these two types at first appears irrelevant to whether a patent should be granted because utility is required at the time an invention is completed. Patent examiners need not consider future utility; patents only issue if there is utility apparent in the application.<sup>75</sup> As a result, no one ever asks whether an invention might have *future* utility because the answer resolves no dispute.

It is no surprise, then, that much of utility doctrine stems from interferences, which are disputes between two applicants claiming the same invention. The winner is usually the first inventor to complete the invention, known as reducing the invention to practice. In turn, reduction to practice must include knowledge of a claim's utility. Interferences often involve one inventor claiming that the other did not complete the invention by a particular date because the invention's use was unknown as of that date. Indeed, the leading Supreme Court case on utility, *Brenner*, was an interference appeal.<sup>76</sup> Because interferences test the date on which use was first known, questions of perpetually useless inventions never arise.

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74. See Koneru, *supra* note 5, at 626–27 (explaining that early disclosure of an invention is a “fundamental objective of the patent system” and that granting a patent only when a use is shown “discourages early disclosure of inventions that are otherwise technically meritorious,” which may result in abandoned applications).

75. *Brenner v. Manson*, 383 U.S. 519, 534 (1966) (“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.”); *Cross v. Iizuka*, 753 F.2d 1040, 1044 (Fed. Cir. 1985) (“Where a constructive reduction to practice is involved, as contrasted to an actual reduction to practice, a practical utility for the invention is determined by reference to, and a factual analysis of, the disclosures of the application.”).

76. *Brenner*, 383 U.S. at 521.

However, distinguishing inventions that may have future use from those that will not is relevant outside of priority battles. The ambivalence toward post-application utility ignores utility's two distinct functions: determining completion of the invention and determining general patentability. Failure to separately consider these two functions, and the timing associated with them, undermines utility's role as a policy lever for different classes of inventions.

For example, failure to distinguish never-useful inventions from undiscovered-use inventions blurs commercial analysis of utility. Since Justice Story's statement in *Lowell* that "[a]ll that the law requires is, that the invention should not be frivolous or injurious,"<sup>77</sup> conventional wisdom has accepted that utility should be de minimis because mostly useless inventions will not affect others who wish to create useful inventions.<sup>78</sup> However, not all minimal use inventions will remain so; some require product development while others require complements such as cheaper manufacturing, component parts, or distribution.<sup>79</sup> On the other hand, some inventions will never be of significant use to the public.

Timing considerations are not limited to practical utility; operable utility might also be time sensitive. Take, for example, fast-tracked pharmaceuticals like a flu vaccine. Investment in creating such pharmaceuticals would be incentivized by patents, and especially by early patents.<sup>80</sup> Because operable utility must also exist at the time of filing, the invention is not complete if a person familiar with the technology would not believe the vaccine to have effective potential.<sup>81</sup> However, where two researchers claim to invent the same

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77. *Lowell v. Lewis*, 15 F. Cas. 1018, 1019 (C.C.D. Mass. 1817) (No. 8568).

78. See, e.g., *Many v. Jagger*, 16 F. Cas. 677, 681 (C.C.N.D.N.Y. 1848) (No. 9055) (holding that infringement of a patent implies that the patent must be useful: "[I]f [an invention] is at all valuable, if its use for the purpose for which it is constructed is practicable, that is sufficient to sustain it as a useful invention.").

79. Michael Abramowicz, *The Danger of Underdeveloped Patent Prospects*, 92 CORNELL L. REV. 1065, 1081 n.63 (2007) ("[I]t might not make sense to commercialize a particular invention until another, complementary invention is developed."); see Richard R. Nelson, *The Economics of Invention: A Survey of the Literature*, 32 J. BUS. 101, 104 (1959) ("Many inventions occurred when they did because of shortly preceding scientific breakthroughs that had lowered the 'cost' of invention.").

80. See Nelson, *supra* note 79, at 107.

81. *Brenner*, 383 U.S. at 534–35; *Rasmusson v. SmithKline Beecham Corp.*, 413 F.3d 1318, 1324–25 (Fed. Cir. 2005) (refusing to find utility when "a person of ordinary skill in

vaccine, operability should be irrelevant; either they both have therapeutic benefits or neither has.<sup>82</sup> Yet, under current law a contested patent would go to the first to perform a few tests rather than the first to create the drug.

This leads to a utility policy pivot. Granting the patent to the first to carry out successful tests might create an incentive to test too soon. Granting the patent to the first to create the drug might limit wasted resources associated with patent races. Further, because operable utility of pharmaceuticals is often evidentiary,<sup>83</sup> utility can act as a timing lever if tests showing therapeutic effectiveness are allowed after the patent application is filed.<sup>84</sup>

This type of pivot is easily achievable by the courts. The Patent Act requires only instructions about how to make and use the invention;<sup>85</sup> the requirement that operable or practical utility be apparent in an application is judicially mandated and modifiable. Further, because the utility standard is different than the FDA drug approval standard,<sup>86</sup> there is no therapeutic harm to encouraging early filings; the only effect is an investment incentive.<sup>87</sup> Of course, allowing early filing may not provide the desired incentives, but the point is that the timing of different types of utility is important and can be adjusted to suit policy needs.

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the area would not have believed” that the invention was useful as claimed and when evidence of effectiveness was acquired after filing).

82. The practical utility of a targeted pharmaceutical like a vaccine is apparent and would also be irrelevant in a priority contest.

83. *Brenner*, 383 U.S. at 531–32 (“Even on the assumption that the process would be patentable were respondent to show that the steroid produced had a tumor-inhibiting effect in mice, we would not overrule the Patent Office finding that respondent has not made such a showing.”).

84. *Cf.* *Koneru*, *supra* note 5, at 658 (“Thus, the irony is that, in the case of pharmaceuticals, what is useful according to *Brana* may lack any practical utility in the real world if the FDA declares that the patented compound is not safe and effective for human treatment.”).

85. 35 U.S.C. § 112 (2006) (“The specification shall contain a written description of the invention, and of the manner and process of making and using it . . .”).

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

87. *In re Hartop*, 311 F.2d 249, 255 (C.C.P.A. 1962) (“True it is that such substance would be more useful if they were not dangerous or did not have undesirable side effects, but the fact remains that they are useful, useful to doctors, veterinarians and research workers, useful to patients, both human and lower animal, and so are useful within the meaning of 35 U.S.C. § 101.”).

In short, there is a big difference between an invention with no use and one with no use *yet*.<sup>88</sup> Ironically, Justice Story's view implies that interminably useless patents should not be a concern even though current doctrine disdains such inventions the most. However, patenting inventions that have no current use, but might have future use, may impose the greatest cost on society.<sup>89</sup>

Ignoring post-invention developments thus affects Justice Story's *laissez faire* attitude toward utility. This is not a normative pronouncement about what the law should be; some might argue that broad patents should issue early to incentivize the inventor,<sup>90</sup> while others might argue that narrow patents should issue late to unblock future inventors.<sup>91</sup> Regardless of normative viewpoint, the timing for determining whether and how an invention is useful must be considered to fully understand the doctrine's power.

#### IV. RE-EXAMINING PRACTICAL UTILITY

Practical utility requires some known use other than as an object of, or tool for, research;<sup>92</sup> and whether chemicals and other compositions with unknown uses should be considered useful has vexed scholars for years.<sup>93</sup> Indeed, much utility scholarship focuses on this quandary.

Three questions dominate the discussion: 1) whether practical utility is a "legitimate" test; 2) whether use as a research tool

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88. Some cases state that use by others implies utility, but these cases do not look at usefulness at the time of invention. *See, e.g.*, *Gandy v. Main Belting Co.*, 143 U.S. 587, 595 (1892); *Lehnbeuter v. Holthaus*, 105 U.S. 94, 96–97 (1881). It may be that a patent had no use at the time of invention, but acquired a use later based on complementary technology.

89. Zuhn, *supra* note 13, at 986 ("However, because the function of these sequences can be eventually determined, such sequences are not truly useless, and therefore, limited monopolies extended on such sequences may ultimately be of great cost to the public." (citation omitted)). Part IV below discusses some of the costs associated with allowing patents on inventions with yet undiscovered practical utility.

90. A. Samuel Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century*, 38 AM. U. L. REV. 1097, 1127 (1989).

91. *See, e.g.*, Eggert, *supra* note 70, at 781–82 ("The first inventor is rewarded for much more than he has given. He discloses one use, yet is 'paid' for all. Furthermore, the necessity of seeking the first inventor's cooperation can hardly be an inducement to experimentation or investment by others.").

92. *Brenner v. Manson*, 383 U.S. 519, 534–35 (1966); *In re Fisher*, 421 F.3d 1365, 1378 (Fed. Cir. 2005).

93. Other types of practically useless inventions—such as the pet rock—surely exist, but these have escaped the attention of most scholars.

(including as a chemical intermediary)<sup>94</sup> is patentable utility; and 3) whether compositions with currently undiscovered uses should be patentable. This part re-examines these three questions and introduces a new way to think about practical utility: as a way to increase commercialization of patented inventions.

*A. Statutory and Precedential Legitimacy of Practical Utility*

*Brenner's* practical utility rule was initially controversial. The patent office had often allowed patents claiming chemicals without any known use other than scientific research. Many thus argued that *Brenner* changed the law.<sup>95</sup>

Nonetheless, there is reason to believe that the Supreme Court's reading of the practical utility standard is congressionally sanctioned. The Court of Customs and Patent Appeals (predecessor to the Federal Circuit) issued a ruling quite similar to *Brenner v. Manson* in its 1950 decision *In re Bremner*<sup>96</sup> (note the confusing similarity between *Brenner* and *Bremner*).

A mere two years after *Bremner*, Congress enacted a completely overhauled Patent Act, written in part by Judge Rich. The revised act did not overrule or otherwise seek to cabin *Bremner's* practical utility rule.

Judge Rich argued that Congress did not intend a practical utility standard because the case law prior to 1952 did not have such a requirement.<sup>97</sup> He did not understand *Bremner* to require practical utility.<sup>98</sup> As part of his push for a single de minimis utility standard, Judge Rich's dissent in *In re Kirk*<sup>99</sup> argues that *Bremner* merely

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94. A chemical intermediary is a chemical which has no purpose other than use in a process to make another chemical. If the end product has no practical use, then the chemical intermediary has no practical use under the current law.

95. See *In re Kirk*, 376 F.2d 936, 952–54 (Rich, J., dissenting); Eisenberg & Merges, *supra* note 5, at 5 (“The U.S. Supreme Court suggested a larger role for the utility requirement in *Brenner v. Manson*.” (citation omitted)).

96. 182 F.2d 216, 217 (C.C.P.A. 1950) (“It is our view that no ‘hard and fast’ ruling properly may be made fixing the extent of the disclosure of utility necessary in an application, but we feel certain that *the law requires that there be in the application an assertion of utility and an indication of the use or uses intended.*”).

97. *Kirk*, 376 F.2d at 952–54 (Rich, J., dissenting).

98. Judge Rich was not on the panel that decided *Bremner*.

99. 376 F.2d 936, 947–966 (Rich, J. dissenting).



required a statement of use, and that the Patent Office incorrectly reinterpreted that statement to require practical utility.<sup>100</sup>

This narrow interpretation of *Bremner* and other case law is suspect. While *Bremner* did not explicitly require practical utility, it implicitly did so because the invention disclosed could certainly have been used for further study, yet the *Bremner* court found a lack of utility.<sup>101</sup> Further, the *Kirk* dissent makes no mention of *Bremner*'s pre-1952 Patent Act status.

Even disregarding *Bremner*, it is not even clear that no practical utility requirement existed in 1952. As discussed above, practical use was mentioned by Justice Story as early as 1817.<sup>102</sup> *Potter v. Tone*,<sup>103</sup> a key case that Judge Rich<sup>104</sup> and others argue required no practical utility, in fact involved a patent that showed some practical utility along with research use.<sup>105</sup> Furthermore, many early cases appeared to require practical utility.<sup>106</sup> Thus, scholars began discussing practical utility at the Patent Office and in courts no later than 1945,

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100. *Id.* at 952.

101. *Bremner*, 182 F.2d at 217.

102. *Bedford v. Hunt*, 3 F. Cas. 37, 37 (C.C.D. Mass. 1817).

103. 36 App. D.C. 181 (D.C. Cir. 1911).

104. *Kirk*, 376 F.2d at 953 (Rich, J., dissenting).

105. *Potter*, 36 App. D.C. at 185 (“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. Its value for educational purposes in demonstrating to chemists the character and properties of ‘the long-sought silicon monoxid;’ its use as a reducing agent in chemical reactions, and the fact that it is a nonconductor of electricity, are sufficient to assist in promoting the progress of the useful arts and to establish the utility of the invention.”); Vibber, *supra* note 65, at 784 (*Potter v. Tone* required practical utility).

106. *See, e.g.,* *Sherwood v. Drewson*, 29 App. D.C. 161, 173 (D.C. Cir. 1907) (“Reduction to practice must produce something of practical use, coupled with a knowledge . . . that the thing will work practically for the intended purpose.”); *Thomas v. Michael*, 166 F.2d 944 (C.C.P.A. 1948) (reversing a finding of no utility where compound was useful as a catalyst for cracking); *In re Holmes*, 63 F.2d 642, 643 (C.C.P.A. 1933) (“The difficulty with appellant's position is that he assumes that, inasmuch as the pipe constructed in accordance with the claims is useful, it follows that utility of the invention is established. The 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.”); *Scovill Mfg. Co. v. Satler*, 21 F.2d 630, 634 (D. Conn. 1927) (“[P]laintiff has introduced theoretical evidence based upon practical use, which convinces me that the Lowenstein condenser produces the result ascribed to it in the patent.”); *Safeguard Account Co. v. Wellington*, 86 F. 146, 148 (C.C.D. Mass. 1898) (failure to show a substantial step in practical utility implies a lack of invention).

well before *Brenner* was decided<sup>107</sup> and the 1952 Patent Act was drafted.

Further, Judge Rich argued that the statutory requirements remained unchanged since 1790, but he did not mention the re-introduction of the “sufficiently useful and important” requirement in the 1836 Patent Act.<sup>108</sup> This requirement—further discussed below—implies that Congress intended a heightened utility standard in the statute at the time *Brenner* was decided.

Based on the entire history of cases and statutes, arguments that practical utility was newly imagined in *Brenner v. Manson* are not terribly persuasive. If Judge Rich intended to clarify *Brenner* and other cases that many people thought required some form of practical utility, his best opportunity to do so was when he helped draft the 1952 Patent Act, and he did not.<sup>109</sup> Congress has never amended the rule, nor do current patent reform proposals include such an amendment.

### B. Research Tools

Many inventors have tried and failed to patent chemical intermediaries and other inventions whose sole purposes was to aid further research. The question is why such applications should be rejected, especially when some “non-useful” inventions are in high demand,<sup>110</sup> sometimes commanding high market prices.<sup>111</sup>

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107. See John Boyle, Jr. & Henry C. Parker, *Patents for New Chemical Compounds*, 27 J. PAT. OFF. SOC'Y 831, 835 (1945); Levy, *supra* note 9, at 593–94; Vibber, *supra* note 65, at 778 (“It is not sufficient under such circumstances, that a device, method, or composition of matter be described which is proved later to have utility where no useful purpose is ascribed to such subject matter in the application.”).

108. *Kirk*, 376 F.2d at 954 (Rich, J., dissenting). Part V, below, discusses the 1836 Patent Act in detail.

109. *But see* Eggert, *supra* note 70, at 772 (summarizing Judge Rich’s arguments in *Kirk*, 376 F.3d 936 (Rich, J., dissenting) and *In re Joly*, 376 F.2d 906 (C.C.P.A. 1967) (Rich, J., dissenting), that Congress intended that practical utility not be considered, but *Brenner* ignored Congressional intent).

110. See Eisenberg & Merges, *supra* note 5, at 6 (“[R]esearch discoveries that are the subject of serious scientific investigation may be sold commercially to researchers long before they have ripened into products for sale to the general public.”); Johnson, *supra* note 54, at 312–13 (discussing the value of any information in the field, including failed inventions).

111. *In re Fisher*, 421 F.3d 1365, 1370 (Fed Cir. 2005) (discussing commercial success of unpatentable gene fragments).

High prices for research tools are not, in isolation, evidence of the practical use envisioned by *Brenner*.<sup>112</sup> There may be several reasons that researchers might be willing to pay for such materials that are unrelated to public benefit. First, they might be costly to create. Second, the compound may be more pure or otherwise better suited for research, which is valuable but not practical under *Brenner*. Third, their manufacturing process may be secret; in fact, if patentability is denied, then secrecy may be the only way to obtain recovery of investment.

These reasons fail to answer the primary question, which is why one would pay *anything* for something with no practical use no matter how rare, helpful, or secret it may be. Of course, they would not. There must be some use to research tools.<sup>113</sup> This answer reveals a fundamental normative foundation of the patent system: basic science, no matter how important and valuable, does not merit protection and is therefore not useful in the patent sense.<sup>114</sup> As a result, new compositions which do nothing but aid basic science are also not patentable; practical utility acts as a type of subject matter restriction.

The bias against basic science is evident in case law,<sup>115</sup> which routinely recites that principles of nature<sup>116</sup> such as gravity and relativity are not patentable.<sup>117</sup> It is revealed in cases that distinguish

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112. See *Utility Requirement*, *supra* note 5, at 161 (arguing that commercial success is no longer conclusive evidence of utility because many other factors may affect commercial success).

113. David G. Perryman & Nagendra Setty, *The Basis and Limits of the Patent and Trademark Office's Credible Utility Standard*, 2 J. INTEL. PROP. L. 509, 532–33 (1995).

114. Abramowicz, *supra* note 79, at 1100 (“Unsurprisingly, courts have been skeptical of efforts to obtain broad patent protection for scientific studies.”); Rushforth, *supra* note 46, at 513 (“The decisions in *Manson*, *Kirk* and *Joly* seem effectively to exclude research chemists from the class of people for whom an invention may be useful.”). *But see* Cohen & Schwartz, *supra* note 66, at 90 (arguing that basic science in mechanical and electrical arts lead to clear practical utility); *Utility Requirement*, *supra* note 5, at 157 (explaining that intermediaries used in mechanical arts are generally considered useful).

115. See, e.g., *In re Ruschig*, 343 F.2d 965, 970 (C.C.P.A. 1965) (“[I]s it not also evident that a patent system must be related to the world of commerce rather than to the realm of philosophy?”), *quoted with approval in* *Brenner v. Manson*, 383 U.S. 519, 536 (1966).

116. *O'Reilly v. Morse*, 56 U.S. 62, 116 (1854) (“[T]he discovery of a principle in natural philosophy or physical science, is not patentable.”).

117. *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.”).

between abstract and applied discoveries<sup>118</sup> or that deny patentability to new discoveries about unaltered natural products.<sup>119</sup>

Justifying the bias, on the other hand, is more difficult; the goal of this discussion is merely to explain it. Reasons advanced by others vary. Some argue that fundamental truths must be free for all;<sup>120</sup> some worry about the effect on downstream innovation;<sup>121</sup> some distinguish between scientific knowledge and invention;<sup>122</sup> some argue that scientific explanations cannot be reduced to a concrete right to exclude,<sup>123</sup> and some may simply desire to incentivize manufacturing instead of science.<sup>124</sup>

Even though patent policy disfavors basic science, there is still demand for it.<sup>125</sup> Academic and government laboratories are in the business of discovery and need research tools to accomplish their goals. Where there is demand, someone will be willing to pay for the required prerequisites, and thus there is a market for unpatentable research tools.<sup>126</sup> No matter how strong this market is, the tools and their end result will not be considered practically useful until applied

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118. *See, e.g.*, *MacKay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939) (reasoning that “a novel and useful structure,” such as a radio antenna, could be patentable subject matter even though its dimensions directly correspond to a natural phenomenon).

119. *See, e.g.*, *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130–31 (1948).

120. *See, e.g.*, *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.” (quoting *Le Roy v. Tatham*, 55 U.S. 156, 175 (1853))).

121. *See, e.g.*, Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305, 320–31 (1992).

122. *See, e.g.*, Nelson, *supra* note 79, at 105. *But cf.* Eisenberg & Merges, *supra* note 5, at 6 (1995) (“Whether or not there was a meaningful distinction to be drawn between the realm of philosophy and the world of commerce in the field of steroid chemistry in the 1960s, it is a very difficult distinction to maintain in biotechnology in the 1990s, with researchers in government and university laboratories seeking patent protection for their discoveries and with private firms developing research tools for commercial sale.”).

123. *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 288–89 (1977) (arguing that the patent system cannot grant a “meaningful property right around an explanation” provided by basic research).

124. *See, e.g.*, Abramowicz, *supra* note 79, at 1100 (discussing complexities of attempting to patent scientific discoveries). *But see* Nelson, *supra* note 79, at 105 (arguing that science can greatly decrease the cost of invention).

125. *See* Rushforth, *supra* note 46, at 510–12 (discussing market for research).

126. *See* Lawrence R. Velvel, *A Critique of Brenner v. Manson*, 49 J. PAT. OFF. SOC’Y 5, 9–10 (1967) (arguing that patent claims with research use should be patentable just like claims with a commercial use).

to some product or process that might confer a benefit on the general public.

Recognition of a normative bias against basic science is important; it frees Congress and the courts to either embrace or oppose basic science by varying utility requirements in a particular technological field. For example, to the extent the field is favored, practical utility could be made easier to prove.

This policy lever can be implemented by courts but depends on usefulness being an interpreted statutory requirement, rather than a constitutional one. If “useful arts” is a term of art as a phrase,<sup>127</sup> usefulness is likely a statutory requirement.<sup>128</sup> Of course, Congress can also clarify what “new and useful” means, but it has not done so.

*In re Brana*<sup>129</sup> is a good example of how courts can vary practical utility to achieve policy goals. There, the Federal Circuit upheld a patent on a chemical that might have been helpful for future cancer research, though experimental data was quite preliminary when the patent application was filed.<sup>130</sup> The court ruled that Brana’s data was sufficient to show some future applied benefit to people; had the research related to some less desirable outcome—something it considered basic science—then it might have deemed the composition useful only for further research.<sup>131</sup>

This may explain why there are plenty of research tools that are deemed worthy of patents, such as microscopes and test tubes.<sup>132</sup> While these tools might aid basic science, they also aid commercial development and manufacturing with very specific uses that more immediately benefit the public.<sup>133</sup> Further, they are (for the most part) created using traditional raw materials and traditional manufacturing processes and are sold as commodities on the open market. Most disfavored research tools are created in laboratories

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127. Walterscheid, *supra* note 10, at 52.

128. *Cf.* Machin, *supra* note 63, at 437–38 (arguing that usefulness means different things in constitution and statute); Velvel, *supra* note 126, at 13 (arguing that practical utility is a statutory requirement, not a constitutional bar). *But see* Oddi, *supra* note 90, at 1119–20 (asserting that *Brenner* raises practical utility to an invariable constitutional level).

129. 51 F.3d 1560 (Fed. Cir. 1995).

130. *Id.* at 1568.

131. *Id.* at 1568–69.

132. *See, e.g.*, Microscope, U.S. Patent No. 4,836,667 (filed May 4, 1987).

133. *In re Fisher*, 421 F.3d 1365, 1373 (Fed. Cir. 2005) (“[A] microscope has the specific benefit of optically magnifying an object to immediately reveal its structure.”).

using chemical processes and sold to other researchers using restrictive material transfer agreements.

*C. Practical Usefulness as a Commercialization Lever*

Some compositions are useful only as objects of further research because their creators have not yet discovered their practical use, if any. The practical usefulness doctrine denies patentability to such inventions due to lack of practical utility.<sup>134</sup> It is tempting to accept anti-science bias as the sole explanation for unpatentability, but many such compositions are created by pharmaceutical companies and other commercial producers who hope to discover a commercial use in the future.<sup>135</sup>

If a patent were allowed despite the lack of practical utility, then only the inventor could capitalize on new uses.<sup>136</sup> Some argue that this is optimal for coordinating further research about uses<sup>137</sup> or that the patent disclosure is sufficient to allow others to experiment to discover new uses.<sup>138</sup> Others might say that a patent gives the patentee an incentive to discover a use and allows her to capture the benefit of what might ordinarily be unpatentable post-invention commercialization efforts.<sup>139</sup> Still others might argue that patentees will sit on their rights and that competition is better, especially where patentees might block commercialization of new uses discovered by others.<sup>140</sup> Further, because all uses are covered by a patent, society should make sure there is such a use before locking out others who might spend money to discover the use.<sup>141</sup>

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134. *Brenner v. Manson*, 383 U.S. 519, 535 (1966).

135. Andrew T. Kight, Note, *Pregnant with Ambiguity: Credibility and the PTO Utility Guidelines in Light of Brenner*, 73 IND. L.J. 997, 1021 (1998) (discussing time lag between discovery of a chemical and its commercial release).

136. As discussed in detail below, others can obtain patents on new uses, but the initial patentee can block commercialization of such uses.

137. Kitch, *supra* note 123, at 285–87. Note, though, that utility is still important, as barely useful inventions are unlikely to garner much commercialization effort.

138. Velvel, *supra* note 126, at 8–9; Rushforth, *supra* note 46, at 514–15.

139. Sichelman, *supra* note 2, at 366 (“[R]eward theory finds that protection is unnecessary for *ex post* commercialization efforts.”).

140. Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 860–61 (1990).

141. Grady & Alexander, *supra* note 121, at 339–40 (explaining that where use is unknown, risk averse courts do not want to grant patents because they do not know what could happen downstream).

This Article is neutral with regard to these competing arguments. Rather it emphasizes that the timing of practical utility can be an important tool for driving commercialization of important discoveries, but the effect of the law is subject to normative considerations on each side of the argument.

*1. Commercialization arguments in favor of practical utility*

*a. Practical utility and blocking patents.* One normative reason to deny patentability to compositions of unknown use is to avoid inefficient blocking patents.<sup>142</sup> A blocking patent stops future improvers from selling an invention because the underlying technology is patented by someone else.<sup>143</sup> Thus, a patent on Chemical X will stop anyone who later discovers a use for Chemical X from selling it.<sup>144</sup> This, of course, reduces the incentive for future researchers to discover a use for Chemical X, leaving the task solely to the original inventor, which may be economically inefficient.<sup>145</sup> As a result, early filing rewards invention rather than commercialization such that “broad claims can impose unwarranted burdens on third-party commercializers” who might exploit the invention to the public’s benefit.<sup>146</sup>

Consider, for example, *Brenner*, where the alleged first inventor to create a new steroid did not discover a use for it.<sup>147</sup> The later inventors discovered a beneficial use, which they subsequently disclosed in their patent application.<sup>148</sup> Had the original inventor obtained a patent, research to find a new use might have stopped, and the benefits of the steroid would never have been discovered; indeed, the original inventor waited years without trying to find a use.<sup>149</sup> Of course, discovery of the use might happen in any event; in *Brenner*, each researcher worked at roughly the same time, such that

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142. Merges & Nelson, *supra* note 140, at 870–71.

143. *Id.* at 860.

144. While one who discovers a new use for an existing composition is entitled to a patent under § 101, a patent only confers a right to exclude others from that use, not a right to make the underlying composition in the first place. 35 U.S.C. § 271 (2006) (infringement if one “makes, uses, offers to sell, or sells any patented invention”).

145. Merges & Nelson, *supra* note 140 at 870–71.

146. Sichelman, *supra* note 2, at 344.

147. *Brenner v. Manson*, 383 U.S. 519, 521–22 (1966).

148. *Id.* at 520–21.

149. *Id.* (Manson filed in 1960, but claimed to invent in 1956).

granting a patent to the first inventor might not have thwarted discovery of the steroid's use. This will not be true in every case, especially where an applicant files earlier than the first inventor in *Brenner* did.

To be sure, all patents block others to some extent,<sup>150</sup> but society may be more willing to tolerate blocking where the initial inventor has discovered some beneficial use for the new material.<sup>151</sup>

*In re Fisher*<sup>152</sup> provides an example of a blocking patent filed by a commercial entity. There, the applicant claimed (and assigned to a Monsanto Company subsidiary) five gene fragments called expressed sequence tags, or ESTs.<sup>153</sup> An EST is not a complete gene—it is only a portion of the gene, but it can be used as a “gene probe” to determine what genes are present in a mixture of DNA.<sup>154</sup> This is similar to a word processor search for “he” in a document where the search will find all instances of “the.” In *Fisher*, however, the applicant did not know the function of the gene from which the ESTs were extracted.<sup>155</sup> Using the word processor analogy, the inventor could search for a sequence of letters “he,” but if the search found the word “helot,”<sup>156</sup> he would have no idea if the search found a real word.<sup>157</sup> Nonetheless, a patent on the fragment “he” would bar others who use the word “*helot*.”

The applicant claimed that ESTs could be used in a variety of ways, such as “measuring the level of mRNA in a tissue sample” and “serving as a molecular marker for mapping the entire maize

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150. Machin, *supra* note 63, at 438–39.

151. Sichelman, *supra* note 2, at 354 (discussing the role of blocking patents: “[A]ny activity following the initial invention that leads to a commercially available product or service—including developing, testing, manufacturing, sales, and service of the initial invention, *as well as* the invention and subsequent development of improvements—should be viewed as part of ongoing ‘commercialization’ of the original invention.”).

152. 421 F.3d 1365 (Fed. Cir. 2005).

153. *Id.* at 1367.

154. *Id.* (“An EST is a short nucleotide sequence that represents a fragment of a cDNA clone . . . . When an EST is introduced into a sample containing a mixture of DNA, the EST may hybridize with a portion of DNA. Such binding shows that the gene corresponding to the EST was being expressed at the time of mRNA extraction.”).

155. *Id.* at 1368 (“Nevertheless, Fisher did not know the precise structure or function of either the genes or the proteins encoded for by those genes.”).

156. See *Helot*, OPEN DICTIONARY, <http://open-dictionary.com/Helot> (last visited Oct. 13, 2010).

157. *Fisher*, 421 F.3d at 1373 (“One of the claimed ESTs, by contrast, can only be used to detect the presence of genetic material having the same structure as the EST itself.”).



genome.”<sup>158</sup> The Federal Circuit disagreed and affirmed a factual finding by the Board of Patent Appeals and Interferences that the proffered uses had no practical utility because they were neither specific nor substantial.<sup>159</sup> The proffered uses were not substantial because they had no presently available benefit to the public; they were instead useful to learn more about the genes from which they came.<sup>160</sup> The suggested uses were also not specific because they were so vague as to be meaningless; any gene fragment could have been used for the same purposes.<sup>161</sup>

It may be that some ESTs are useful as gene probes, and as such they should be patentable. However, gene probe functionality should be specifically described and enabled so that skilled researchers can determine which fragments will probe for which genes.<sup>162</sup> It is important, though, that the patent also disclose the function of the underlying gene; a probe for a useless gene is also useless and a potentially inefficient block on future innovation.

Further, the claims should be directed to “gene probes” rather than “DNA fragments” to reflect the disclosed use and its tie to novelty.<sup>163</sup> Claims phrased as such should be interpreted to foreclose infringement claims against those who later use the underlying gene (which must necessarily include use of the fragment) for another purpose. Following these guidelines, gene probe ESTs would follow discovery of the entire gene and its function rather than precede it, stopping the use of gene fragments as blocking patents against those who discover the function of the underlying genes.

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158. *Id.* at 1368.

159. *Id.* at 1379.

160. *Id.* at 1371 (“It thus is clear that an application must show that an invention is useful to the public as disclosed in its current form, not that it may prove useful at some future date after further research.”).

161. *Id.* at 1374 (“Any EST transcribed from any gene in the maize genome has the potential to perform any one of the alleged uses. . . . Nothing about Fisher’s seven alleged uses set the five claimed ESTs apart from the more than 32,000 ESTs disclosed in the ’643 application or indeed from any EST derived from any organism.”).

162. *Id.* at 1373 (“[A] claim directed to a polynucleotide disclosed to be useful as a ‘gene probe’ or ‘chromosome marker’ . . . fails to satisfy the specific utility requirement unless a specific DNA target is also disclosed.”).

163. Koneru, *supra* note 5, at 663–64 (explaining that ESTs should be patentable, but limited in scope such that entire genes and gene probes are not included within the ambit of the patent).

*b. Practical utility and commercial development.* Allowing patents before a use is discovered could impede the development of useful technical and market information. If such information need not be disclosed in the patent then there is less incentive to invest in its development.<sup>164</sup>

Further, because investment in the commercial development of compounds may be considered unpatentable market experimentation rather than invention,<sup>165</sup> allowing patents on unknown-use products might shift incentives toward investing in patentable inventive activities rather than unpatentable market experimentation, even though market experimentation may produce a larger social benefit.

Searches for unknown-use compounds may be wasteful when scarce resources could be used to commercially develop known compounds. To be sure, inventors seek out new compounds because they expect profits in the future, but it may be more optimal to focus efforts on commercializing existing known-use products now rather than seeking patents on new compounds that might become beneficial later.

If, however, unknown-use products are unpatentable, then market experimentation becomes more attractive, and thus better aligns private incentives with social welfare. On balance, requiring practical utility should cause companies to spend more on commercialization than they might if inventions could be patented without such usefulness.

*c. Practical utility and fraudulent commercialization.* A final normative reason to disallow unknown use claims is to limit commercialization of non-beneficial products. For example, marketers might use a patent grant to imply that a product is both functional and beneficial.<sup>166</sup> Practical utility becomes important given

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164. Cotropia, *supra* note 73, at 95 (“This lack of technical and market information at early filing generates uncertainty about the future value of the invention and, in turn, the value of the patent-holder’s right of exclusivity.”).

165. *In re Smith*, 714 F.2d 1127, 1135 (Fed. Cir. 1983) (explaining that commercial exploitation through market testing is not experimental use and can invalidate patent); Michael Abramowicz & John Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 344 (2008) (“[T]he granting of intellectual property protection—specifically, patents—is not dependent upon the extent to which an innovation will promote market experimentation.”).

166. *Mahler v. Animarium Co.*, 111 F. 530, 537 (8th Cir. 1901); ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS*

how lax the operable utility requirement is for most inventions; even pharmaceutical inventions do not require proof of human benefits prior to a patent grant.<sup>167</sup> However, a practical utility requirement ensures that the minimal operable utility be related to some particular beneficial use.

While this is not a concern for most pharmaceuticals because the FDA regulates such uses,<sup>168</sup> there are a bevy of products that claim health benefits without any FDA approval. Without practical utility, these products might receive imprimatur of a patent without such regulation. Even though false advertising laws may forbid wrongdoing, further encouraging commercialization of such products through early patenting may not benefit society.

## 2. Commercialization arguments against practical utility

*a. Practical utility and patent races.* Commercialization considerations do not solely favor a practical utility argument, however. Proponents of patent prospect theory argue that early patents might be economically beneficial because they allow a single owner to control and coordinate improvements.<sup>169</sup> A patent thus incentivizes the owner to discover all of the possible uses and exploit them, whereas leaving the discovery unpatented will allow others to find uses and obtain a patent, reducing the incentive to create the discovery in the first place.

A related argument is that the patent document is a public statement that a compound, even a practically useless one, is off-limits. According to this argument, allowing an early patent avoids rent-seeking races to patent by informing others that they should stop duplicative work in a particular area.

The patent prospecting argument has its limits. Development is often performed simultaneously and secretly. The first notice of a patent application would not surface until at least eighteen months after filing, much too late to stop parallel efforts.

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210–11 (4th ed. 2007); Eisenberg & Merges, *supra* note 5, at 5 (“[I]ssuance of a patent might mislead the public by appearing to represent a government imprimatur of the value of [the product].”).

167. *In re Brana*, 51 F.3d 1560, 1568 (Fed. Cir. 1995).

168. *Id.*

169. Kitch, *supra* note 123, at 285–87; F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327, 333 (2006); Merges & Nelson, *supra* note 140.

Further, granting early patents might actually exacerbate races by incentivizing rent-seeking efforts to patent as many unknown-use compounds as possible.<sup>170</sup> Even if early patenting affects development efforts, it might only shift such efforts from discovering unknown compounds to discovering their use, which may still be less beneficial than commercializing known-use technology. Further, once a use is discovered, the original patentee would be able to block the inventor who discovers a use from commercializing the invention.

*b. Practical utility and patent terms.* One benefit of allowing early patents on unknown-use inventions is that such patents expire earlier, releasing the knowledge to the public domain and allowing others to exploit the knowledge it reveals earlier.<sup>171</sup>

However, the benefits of early expiration may not materialize. Granting patents with no known use may instead extend patent terms while limiting beneficial rivalrous commercialization. The reason lies in double patenting. Double patenting can occur when a patentee claims a product but then later files a new application claiming a use for a product. Because patent terms run from the date of filing, the later use claim would expire later, not earlier.

Delayed expiration would be exacerbated by patents that have no practical use. The product patent would block others from the competitive race to find a use<sup>172</sup> because competitors are not allowed to experiment on the patented compound;<sup>173</sup> thus, the owner of the patent has no pressure to quickly discover a use or file a patent application on a new use.

Courts do not allow such gaming of the system to achieve extended patent terms; as a result, double patenting is ordinarily

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170. Grady & Alexander, *supra* note 121, at 339; Eggert, *supra* note 70, at 781.

171. Merges & Nelson, *supra* note 140, at 878 (“[W]hen it comes to invention and innovation, faster is better.”); Duffy, *supra* note 31, at 444 (“Indeed, the earlier elimination of the patent right almost certainly has a social benefit because the end of the patent term also terminates any deadweight loss associated with the monopoly right.”); Eggert, *supra* note 70, at 782; Koneru, *supra* note 5, at 646–47.

172. *Cf.* Nelson, *supra* note 79, at 104 (discussing role of demand on race to invent).

173. This assumes that the patented product is not available on the market, which is a reasonable assumption where it has no use. Research tools that are available to others might be an exception to this analysis. *See, e.g.*, Velvel, *supra* note 126, at 8–9 (arguing that others will experiment once a patent is published, and that they might find uses that are not blocked by the prior patent).

barred where the new use would have been obvious to the inventor at the time of the initial patent application on the product.<sup>174</sup> Thus, where one tries to patent an obvious use in a second patent, the PTO and courts require that the later patent expire at the same time as the original product patent.<sup>175</sup>

However, the double patenting rule does not apply to inventions with no obvious use. Indeed, if the use were obvious at the time of filing, then the patent would have practical utility, even if not disclosed in the patent document. Thus, it must be assumed that inventions without practical utility have no obvious use.

As a result, any new uses discovered would *not* be subject to double patenting rules, allowing the second patent—the one claiming a use for the previously unknown use invention—to expire later than the original patent, which merely identified the unknown use product. This would lead to an extended patent term, tying up the technology for a longer period. Such a patent extension would negate any of the benefits of early patenting and create new costs associated with longer patent terms.

### *3. Reconciling the considerations*

The contradictory commercialization arguments imply that the potential effect of allowing non-practical patents is difficult to discern. Resolving the conflicting views depends primarily on whether the invention will be made publicly available in the absence of patent protection and on whether patent disclosure by one spurs innovation by others during the term of the patent.

For example, where a researcher discovers Glob X with no known use, there are three potential options for the information: patent, publish, or keep secret.

If the discovery is considered patentable, then the arguments in favor of allowing an early patent described in Part IV apply. Further, disclosure of a new compound can have value for other researchers,

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174. 3A-9 DONALD S. CHISUM, CHISUM ON PATENTS § 9.01 (2009); Cohen & Schwartz, *supra* note 66, at 105 (“A double patenting situation may result if the compound is found to be patentable and the use claimed in the second application is an obvious use.”).

175. Geneva Pharms., Inc. v. GlaxoSmithKline PLC, 349 F.3d 1373, 1385–86 (Fed. Cir. 2003) (“[A] claim to a method of using a composition is not patentably distinct from an earlier claim to the identical composition in a patent disclosing the identical use.”).

even if its use is not disclosed.<sup>176</sup> As discussed in this Part, such arguments are not terribly persuasive. At best, such arguments might foster commercialization through coordination of research on future uses, at the cost of extending patent terms.

If the discovery is published, then all can find new uses, and each discoverer can patent a discovered use. If the original inventor finds a use within one year,<sup>177</sup> then she can obtain a patent on both the original product and the use. If more than a year passes, she would still be entitled to a patent on the newly discovered use, just like any other person who does so. Some might argue that this is unfair to academic researchers who must publish long before a use is found<sup>178</sup> while others would argue that disclosure and competition are best served by allowing free access to information.<sup>179</sup> Bias against academic research is not a terribly persuasive argument because the United States provides more protection than any other country; outside the United States, grace periods are far more limited.<sup>180</sup> Thus, any researcher desiring an international patent may be unable to publish prior to filing, which limits the incentive to publish first and find a use later.

Even if publication does not limit patentability, use patents are not as valuable as composition patents because use patents are more difficult to enforce<sup>181</sup> and because composition claims cover all uses. This likely decreases others' incentives to find uses after publication.

If the discovery is kept secret, only the inventor will pursue finding new uses while others might simultaneously attempt to discover the compound and the use. This allows some potential coordination benefits similar to allowing a patent on the unknown-

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176. Machin, *supra* note 63, at 439 (explaining that society is better off allowing too many patents rather than keeping discoveries secret).

177. 35 U.S.C. § 102 (b) (2006) (barring patents on inventions published more than one year before date of application).

178. Johnson, *supra* note 54, at 314. *But see* Perryman & Setty, *supra* note 113, at 511 (explaining that academia already faces pressure to patent prior to publishing due to international laws that require filing prior to public disclosure).

179. Merges & Nelson, *supra* note 140, at 872 (“We have trouble with the view that coordinated development is better than rivalrous. In principle it could be, but in practice it generally is not.”).

180. Toshiko Takenaka, *Rethinking the United States First-to-Invent Principle from a Comparative Law Perspective: A Proposal to Restructure § 102 Novelty and Priority Provisions*, 39 HOUS. L. REV. 621, 626–27 (2002).

181. Merges & Nelson, *supra* note 140, at 914; Zuhn, *supra* note 13, at 997.

use discovery because the inventor can license others to find a use in secret. However, it has none of the potential public disclosure benefits, to the extent there are any.<sup>182</sup> There is also a chance the inventor will not find the best use and/or will abandon the research altogether.<sup>183</sup> Additionally, any resulting patent will expire no earlier than if a patent were allowed on Glob X even without practical utility.

These three choices illustrate that practical utility's commercialization effects are based on underlying assumptions about the value of disclosure, exclusive rights, and simultaneous competing efforts. The *Brenner* Court, for example, explicitly asserted that the patent disclosure added little value, that inventors would likely not keep the information secret, but would instead coordinate development by contracting with others to discover new uses for unpatentable substances.<sup>184</sup> Others have criticized these assumptions, pointing to publishing pressures and lack of coordination of unpatented information, among other things.<sup>185</sup>

The choice between sharing information and keeping it secret may also reveal an implicit reason why basic science and research tools might not be patentable. If academics, a primary source of such knowledge, have no commercialization incentives, then denying practical utility may best serve societal interest by allowing all to commercialize information that would have been developed and published anyway. As universities increase their focus on commercializing the inventions of their faculties,<sup>186</sup> one might expect publishing norms to change, a trend that has already been observed.<sup>187</sup>

Additional policy considerations apply because patent expiration is the same under the patent and trade secret option. Disclosure with

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182. Velvel, *supra* note 126, at 5 (explaining that practical utility rule disincentivizes disclosure).

183. Machin, *supra* note 63, at 439–40.

184. *Brenner v. Manson*, 383 U.S. 519, 533–34 (1966).

185. Velvel, *supra* note 126, at 7 (arguing that inventors will keep information secret, contrary to assumption in *Brenner*); Rushforth, *supra* note 46, at 503–05 (explaining that the solution to inadequate disclosure is requiring better disclosure, not barring patents that disclose new chemicals without a known use).

186. Most universities own inventions made by their faculties. They might seek to commercialize such inventions for profit and pay royalties to the inventors.

187. Perryman & Setty, *supra* note 113, at 511 (discussing pressure to patent before publishing).

exclusive rights associated with the patent might better induce commercialization, but not necessarily. If trade secret law allows for strong enforcement of license agreements, then inventors may be just as willing to contract out commercialization as they would with a patent. Of course, patenting allows for non-contracting parties to find new uses, so patenting might be preferred. The optimal policy will depend on how one views trade secret law, experimental use exceptions, reverse engineering costs, and blocking patents.<sup>188</sup>

In all events, the practical utility standard will have a significant effect on commercialization paths and likelihoods. It is unlikely that decisions can be made with respect to each patent, and so policy makers—probably courts<sup>189</sup> but potentially Congress—must make rules that will apply in different generalized circumstances. In areas (or for particular types of patentees) where one expects vigorous discovery and exploitation of use, attachment of practical utility at an earlier stage might be preferred.<sup>190</sup> In areas where exploitation is limited or unknown, granting early utility might be detrimental to commercialization incentives.

This distinction may explain some of the case law. Single chemicals with no known use and no ongoing study have generally been denied patentability,<sup>191</sup> while applicants that can show an ongoing research project with some results, even if preliminary, are more likely to receive protection.<sup>192</sup>

Finally, these considerations lend themselves to potentially dividing the practical utility pie. For example, the law could provide separate claims for the process of making a non-useful product, and later allow claims for newly discovered uses of the product without

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188. Compare *Velvel*, *supra* note 126, at 8–9 (explaining that blocking and experimentation are not a problem), with *Merges & Nelson*, *supra* note 140, at 909 (discussing problems associated with blocking patents).

189. *BURK & LEMLEY*, *supra* note 6, at 95.

190. *Duffy*, *supra* note 31, at 444 (discussing savings associated with ending patent races early).

191. See *Brenner v. Manson*, 383 U.S. 519, 534–35 (1966); *In re Kirk*, 376 F.2d 936 (C.C.P.A. 1967).

192. *Cross v. Iizuka*, 753 F.2d 1040, 1051 (Fed. Cir. 1985) (“We perceive no insurmountable difficulty, under appropriate circumstances, in finding that the first link in the screening chain, *in vitro* testing, may establish a practical utility for the compound in question.”); *In re Brana*, 51 F.3d 1560, 1568 (Fed. Cir. 1995) (“Usefulness in patent law, and in particular in the context of pharmaceutical inventions, necessarily includes the expectation of further research and development. The stage at which an invention in this field becomes useful is well before it is ready to be administered to humans.”).



ever granting a patent on the product itself.<sup>193</sup> Courts could implement such a division under the statute as the creation process does have a use—namely the creation of a new chemical.<sup>194</sup> Indeed, the discovering a new composition and its manufacturing method may be highly novel and non-obvious. There may be many reasons to incentivize disclosure of such methods as early as possible, such as making them public so that others can find alternative ways to make the product or find uses for the product.<sup>195</sup> However, to the extent that such new compositions may only be created by a single process, then a how-to-make patent would coincide with a product patent and lead to the same costs. Further, to the extent that such processes are discovered and published anyway, then no additional incentive may be needed to encourage disclosure.

#### V. INTRODUCING COMMERCIAL UTILITY

Because utility is not well understood, efforts to improve the commercial prospects of inventions rarely focus on utility. Instead, scholars look to other patentability criteria<sup>196</sup> or even suggest new forms of intellectual property protection.<sup>197</sup> Even if practical utility is viewed as a commercialization tool as discussed in Part IV, it is an indirect one that only applies to particular types of inventions.

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193. Eggert, *supra* note 70, at 785 (proposing “howtomake” and “howtouse” patents). *But see* Knutson v. Gallsworthy, 164 F.2d 497, 506 (D.C. Cir. 1947) (“It may very well be that the two counts are so distinct as that the holder of a patent on the generic ‘composition of matter’ is entitled to state separately in the same patent a claim to specified uses of the same substance; and, in that sense, the two claims may be patentably distinct. But it does not follow that they are so distinct as to authorize the issuance of separate patents to separate persons.”).

194. *In re* Nelson, 280 F.2d 172, 180–81 (C.C.P.A. 1960); J.C. Holman, Case Note, *Patents—Sufficiency of Disclosure—Utility Requirements of 35 U.S.C. § 101 for Chemical Process Claims—In re* Manson, 14 AM. U. L. REV. 78, 80–81 (1964).

195. Eggert, *supra* note 70, at 782; *see supra* note 171.

196. Abramowicz & Duffy, *supra* note 165, at 399–404 (discussing application of patent doctrine, such as the paper patent rule, to market experimentation); Cotropia, *supra* note 73, at 119 (suggesting an actual reduction to practice requirement); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 721–23 (2001) (relaxing practical utility requirements might aid commercialization); Kitch, *supra* note 123, at 280–83 (discussing obviousness); *id.* at 287–88 (explaining that purpose of disclosure is to stake prospect claims for future commercialization); Abramowicz, *supra* note 79, at 1109 (patent extensions); Sichelman, *supra* note 2, at 395 (discussing working requirements).

197. Sichelman, *supra* note 2, at 402 (suggesting a new “commercialization patent” that rewards commercialization efforts); Abramowicz & Duffy, *supra* note 165, at 405 (discussing “commercialization patents”).

This Article argues that a direct commercial utility requirement would provide an additional and better method to incentivize commercialization than new or collateral requirements. Usefulness is currently required by statute, so a different gloss may not require legislative input. Further, courts have developed a legal framework for considering other categories of utility, such as the determination of when inventions are reduced to practice. Thus, a new category of usefulness can be integrated with existing precedent relatively easily compared with sui generis commercialization proposals.

While commercial utility has never been required by the courts,<sup>198</sup> such a requirement would certainly affect commercialization efforts, even if it might also create some offsetting social costs. This Part first shows that commercial utility is a viable alternative under the statute. Indeed, it might well have been intended by Congress more than 170 years ago. Second, it introduces a doctrinal test for commercial utility. Third, it discusses potential benefits and weaknesses of a commercial utility test.

#### *A. Commercial Utility Is Lost to History*

It is an accident of history that patentability does not directly hinge on commercial usefulness. Little attention has been given to why utility rules developed the way they did and what might have happened in the alternative. Accepting that Congress intended that utility have some teeth more than 150 years ago advances understanding about how utility might be better used to incentivize commercialization today. Indeed, had Congressional intent been implemented by the courts following the 1836 Patent Act, the current statute might well have had a form of commercial utility requirement.

A brief review of utility's history reveals where intent and practice diverged. It also shows that, even under the 1952 Act, usefulness might have been interpreted to have included a commercial utility requirement because the official comment implies that the express requirement was only omitted due to obscure meaning and non-use.<sup>199</sup>

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198. See *Utility Requirement*, *supra* note 5, at 165–66. For some time, however, commercial success served as evidence of utility. *Id.* at 161.

199. P. J. Federico, *Commentary on the New Patent Act*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 197 (1993) (originally published in 1954).

Usefulness appeared three times in the first patent statute, the 1790 Patent Act.<sup>200</sup> The statute provided that 1) a patent may be granted for “useful” inventions or discoveries; 2) one must include a description sufficient to enable one to use the invention;<sup>201</sup> and 3) designated cabinet members must “deem the invention or discovery sufficiently useful and important.”<sup>202</sup> Thus, patents were to be issued only after an examination of utility and importance.<sup>203</sup>

Implementation of the “sufficiently useful and important” requirement was administratively difficult and thus did not last long.<sup>204</sup> It was eliminated in the 1793 Patent Act,<sup>205</sup> though the requirements of usefulness and enablement remained. Further, examination requirements were eliminated altogether, and patents were granted to all who applied.<sup>206</sup>

It was during this un-examined registration period that Justice Story issued his famous opinions in *Lowell* and *Bedford*.<sup>207</sup> Justice Story had no “sufficiently useful and important” language to guide his interpretation of the statute; indeed, that phrase’s absence in the 1793 Act supports his interpretation that—at that time—an invention did not need to be important, but merely operable and practically useful in some way.

The lack of examination did not sit well with Congress, so the Patent Act of 1836 introduced an examination system.<sup>208</sup> As part of this system, in addition to the usefulness and enablement requirements, the Commissioner of Patents was to issue patents for inventions “if [he] shall deem it to be sufficiently useful and important.”<sup>209</sup> It appears that Congress inserted this text in specific response to Justice Story’s more lenient test, which had been generally adopted by courts by 1836. The committee report, often called the “Ruggles Report,” stated:

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200. Patent Act of 1790, ch. 7, § 1, 1 Stat. 109–12 (1790) (repealed 1793).

201. *Id.* § 2.

202. *Id.* § 1.

203. *McGaw v. Bryan*, 16 F. Cas. 96, 102 (S.D.N.Y. 1821).

204. *Id.* (“The investigations, however, at the departments, necessarily summary, were found inconvenient in practice, and the act now in force abolished them . . .”).

205. Patent Act of 1793, ch. 11, § 1, 1 Stat. 318–23 (1793) (repealed 1836).

206. *Id.*

207. *See supra* notes 14 and 15.

208. S. REP. NO. 24-239 (1836) [hereinafter Ruggles Report].

209. Patent Act of 1836, ch. 357, § 7, 5 Stat. 117 (1836) (repealed 1870).

The necessary consequence is, that patents have, under the act of 1793, been daily granted without regard to the question of novelty, or *even utility in the ordinary sense*; for it has been settled that the term useful, as used in this statute, is *only* in contradistinction to hurtful, injurious or pernicious . . . .

The most obvious, if not the only means of effecting [a change to the evils of the registration system which resulted in devaluation of patents], appears to be to establish a check upon the granting of patents, allowing them to issue only for such invention as are in fact new and *entitled, by the merit of originality and utility*, to be protected by law.<sup>210</sup>

Thus, the 1836 Patent Act might have been interpreted to require an elevated level of utility—perhaps even commercial utility in the discretion of the Commissioner. In all events, utility was to require more than the “non-pernicious” *Lowell* rule.

A more stringent utility requirement was rarely enforced, however. Though the Commissioner of Patents was aware of the change, he opted for a narrow interpretation that allowed more patents. The first Annual Report of the Commissioner of Patents after the 1836 Act stated:

Power is given to the Commissioner to refuse a patent, if the invention is not deemed sufficiently useful; but this power is seldom exercised, and is confined to cases where the patent may be in some way injurious, the improvement frivolous, or where an attempt is made to avoid a prior patent. It is the intention of the Commissioner to err (if at all) on the side of liberality, leaving the parties affected to the courts, to contest their doubtful rights.<sup>211</sup>

This important report—the only one to mention the requirement—reveals some important information about the “sufficiently useful” provision. First, the Commissioner clearly understood the statute to grant a new discretionary power. Second, that power was to be different than prior utility definitions. Third, even with restraint, the Commissioner did occasionally deny patents. Fourth, the Commissioner made a deliberate decision to limit the reach of the statute.

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210. Ruggles Report, *supra* note 208 (emphasis added).

211. Patent Office: Annual Report from the Commissioner of Patents, at 1–2 (Jan. 17, 1838).

Rather than apply the sufficiently useful requirement as envisioned by the Commissioner, the courts quickly gutted the “sufficiently useful and important” requirement. Instead, judicial opinions held that Justice Story’s conception of utility survived despite the additional “sufficiently useful and important” language<sup>212</sup> and determined that the Commissioner’s determinations of patentability were essentially reviewable *de novo*.<sup>213</sup> Congress had an opportunity to clarify this interpretation in the 1870 Patent Act, but instead kept the statutory language essentially unchanged.<sup>214</sup>

Part of the justification for limiting the Commissioner’s discretion was that juries would not review Commissioner decisions<sup>215</sup> and courts were wary of allowing the executive to impose discretionary decisions without an appeal to a jury. However, if the Administrative Procedure Act,<sup>216</sup> which today allows for extensive

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212. *In re Aiken*, 1 F. Cas. 227, 229 (C.C.D.C. 1850) (“The decision of the commissioner . . . rest[s] only upon the commissioner’s opinion that the invention was not ‘sufficiently useful and important.’ The degree of usefulness or importance is not described or limited by the statute . . . . If good may be the result of granting a patent, and evil cannot, I should think it ought to be granted . . . .”); *In re Seely*, 21 F. Cas. 1016, 1018 (C.C.D.C. 1853) (relying on Curtis treatise to rule that “sufficiently useful and important” means “non-injurious”); *Seymour v. Osborne*, 78 U.S. 516, 548–49 (1870) (“[T]he 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 . . . .”); *Gibbs v. Hoefner*, 19 F. 323, 324 (C.C.N.D.N.Y. 1884) (“If it was useful in any degree, no matter how infinitesimal, the court would not be justified in declaring the patent void.”); *Haynes Stellite Co. v. Chesterfield*, 22 F.2d 635, 638 (6th Cir. 1927) (“[E]ven in the softer grades [the claimed alloy] was sufficiently useful to support patentability.”).

213. *Reckendorfer v. Faber*, 92 U.S. 347, 355 (1875) (“Upon the proposition that the decision of the commissioner on the question of invention, its utility and importance, is conclusive, and that the same is not open to examination in the courts, we are unanimously of the opinion that the proposition is unsound. His decision in the allowance and issue of a patent creates a *prima facie* right only . . . .”). *Reckendorfer* was a case about obviousness, which is arguably different than a determination about sufficient usefulness and importance, a determination more directly left to the commissioner’s discretion in the statute. *But see id.* at 351 (“It is nowhere declared in the statute that the decision of the commissioner, as to the extent of the utility or importance of the improvement, shall be conclusive upon that point; but, in the section just quoted, it is placed in the same category with the want of novelty and the other requisites of the statute . . . .”).

214. Patent Act of 1870, ch. 230, §§ 24, 26, 31, 16 Stat. 198–217 (1870) (repealed 1952) (setting forth “new and useful,” “make and use,” and “sufficiently useful and important” requirements, respectively).

215. *Aiken*, 1 F. Cas. at 229.

216. 5 U.S.C. § 551 *et seq.* (2006).

discretionary jurisdiction without an appeal to a jury,<sup>217</sup> existed in 1850, the discretion of the Commissioner may have been given much more weight.<sup>218</sup> Ironically, the Supreme Court later relied on the Commissioner's supposed discretion to grant patents only if an invention were "sufficiently useful" when it determined that the Secretary of the Interior had no jurisdiction to overrule the Commissioner's discretion.<sup>219</sup>

The 1952 Patent Act eliminated the "sufficiently useful and important" requirement<sup>220</sup> and instead only required inventions to be "new and useful,"<sup>221</sup> as well as requiring applicants to describe how to use the invention.<sup>222</sup> Legislative history shows that the phrase was omitted because it was "unnecessary"<sup>223</sup> and because "[t]he meaning of this old phrase was obscure and it had seldom been resorted to either in the Patent Office or in the courts."<sup>224</sup>

Despite this claim in the history, it is not clear that elevated utility was unanimously disregarded prior to the 1952 Act.<sup>225</sup> Some courts were still willing—in dicta at least—to require a higher utility threshold,<sup>226</sup> as were patent examiners.<sup>227</sup> The Patent Office had even

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217. For example, patent denials today are appealed directly from the PTO to the Federal Circuit Court of Appeals.

218. See Adam Mossoff, *The Use and Abuse of IP at the Birth of the Administrative State*, 157 U. PA. L. REV. 2001, 2002 (2008–2009) ("Throughout the twentieth century, administrative law and intellectual property law seemed as if they were hermetically sealed off from each other in both theory and practice.").

219. *Butterworth v. United States*, 112 U.S. 50, 65–67 (1884) ("By [the Patent Act of 1836] it was declared to be the duty of the Commissioner to issue a patent if he 'shall deem it to be sufficiently useful and important,' the very discretion previously vested in the three heads of Departments by the act of 1790 . . .").

220. 35 U.S.C. § 131 (1952).

221. 35 U.S.C. § 101 (1952).

222. 35 U.S.C. § 112 (1952).

223. S. REP. NO. 82–1979, at 16 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2413.

224. P. J. Federico, *Commentary on the New Patent Act*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 197 (1993) (originally published in 1954).

225. *Utility Requirement*, *supra* note 5, at 158 (arguing that utility should require positive benefit rather than merely non-frivolousness).

226. *In re Appeals of Drawbaugh*, 9 App. D.C. 219, 239–40 (D.C. Cir. 1896) ("It is incumbent upon [the applicant] not only to comply with all the conditions and provisions of the statute, but, in the language of the statute, to make it appear that he is justly entitled to a patent under the law, and that the invention is sufficiently useful and important to justify the issue of such patent therefor.").

227. *Fletcher v. Watson*, 204 F.2d 68, 69 (D.C. Cir. 1953) (Examiner rejected patent on basis "that the claims are drawn to subject matter which is not sufficiently useful and important to support a patent.").

used the test to reject applications.<sup>228</sup> Indeed, the removal of the “sufficiently useful” requirement caused confusion among examiners right after the passage of the 1952 Patent Act.<sup>229</sup> In fact, Judge Rich, one of the principal authors of the 1952 Act, wanted to avoid this confusion, and stated that the section “was in fact deleted because of the possibility that . . . it might be construed as imposing some limitation on the statutory requirements for patentability over and above the requirements [for utility novelty, and nonobviousness] in sections 101, 102, and 103.”<sup>230</sup>

Thus, while the sufficiency test was never widely implemented and was nominally repealed, this result was a historical accident. If the Commissioner of Patents and the few judges considering the issue early on had instead interpreted the statute more broadly, then a heightened utility requirement—perhaps even a commercial utility standard—might have emerged.

This historical review does not imply that the rules *should* have included a commercial utility requirement, but rather that they *could* have included one. Recognition that the 1952 Act did not intend to eliminate the “sufficiently useful and important” requirement for any reason other than disuse over time allows courts (and certainly Congress) to interpret usefulness as it was originally intended in 1836 by introducing a commercial utility requirement.

### *B. Defining Commercial Utility*

#### *1. A two-pronged standard*

The proposed test would find commercial utility present with sufficient evidence<sup>231</sup> to convince a person with skill in the art that a) there is a market for the invention, and that b) the invention can be

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228. *In re Ratti*, 270 F.2d 810, 815 (C.C.P.A. 1959).

229. *Id.* (“[T]he rejection . . . is predicated solely on a theory of patentability we find to be outside of the patent statutes, namely, that the [claimed invention] is . . . no better than the [prior art]. . . . While [the former statute] may be said to have given the Commissioner some discretion in refusing to grant a patent on an otherwise patentable invention unless ‘the same is sufficiently useful and important,’ [the new statute removed that requirement, such that §101 solely governs the question].”).

230. Giles Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 398 (1960).

231. Like other utility demonstrations, this requirement for evidence can presumably be satisfied if one with skill in the art believes that the invention has some sort of utility.

manufactured at a cost sufficient to fulfill market demand.<sup>232</sup> Given that more than 50% of patents wind up being worthless,<sup>233</sup> an initial review to determine which patents are most likely to be worthless should be practically achievable.

The test would be applied in a manner similar to that of operable and practical utility, such that *expectations* justify utility even if the expectations prove incorrect in hindsight. Furthermore, no invention is complete without commercial utility. Thus, if a person with skill in the art would not expect the invention to be manufacturable in commercial quantities as of the filing date,<sup>234</sup> then the patent would not issue even if the patentee proves skeptics wrong.<sup>235</sup> However, because it is based on expectations, the test does not require actual commercial production, which might conflict with rules that penalize sales of patented inventions before filing. Likewise, a patent expected to succeed would not be void simply because a product incorporating the patent flops in the market.

The first factor seems straightforward: in order to be commercially useful, some group of people must want to purchase it. The primary doctrinal oddity is that a person having skill in the art of the invention will not necessarily be an economist or some other specialist with sufficient information to assess market demand. As a result, the test would likely be applied as a determination a skilled artisan would make with the benefit of information from those who know about market demand. The quality of evidence required is discussed further below.

The second factor constrains the result somewhat, by only allowing a finding of commercial utility where there is evidence that near-term market demand can be satisfied. In other words, the factor

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232. Nelson, *supra* note 79, at 108 (explaining that anticipated future demand drives incentives to invest in research and development).

233. See Moore, *supra* note 2, at 1526 (arguing that “[r]enewal rate data is a better predictor of patent value than litigation data,” and since 53.71% of patentees allow their patents to expire by refusing to pay the \$900 maintenance fee, this strongly suggests that these patents are worthless).

234. More technically, utility must be present in order to prove that the invention was reduced to practice, which must occur on or before the filing date.

235. Rasmusson v. SmithKline Beecham Corp., 413 F.3d 1318, 1322 (Fed. Cir. 2005) (affirming the Board of Patent Appeals’ decision to deny an inventor priority based on prior patent applications because “none of the applications filed [previously] ‘would have enabled a person of ordinary skill . . . to treat human prostate cancer [by using the proposed invention].’”



bars inventions that will remain so expensive to reproduce for such a long period of time that many who might want to purchase the invention are unable to obtain it.

The commercial utility requirement embraces not only inventions of stand-alone consumer goods, but also non-consumer products, components of more complex products, and even methods. For each type of invention, the question will be the same: can it be delivered to or practiced by a sufficient market at a market-clearing price? Inventors of components may have more difficulty because they must show that the cost of the component will not drive up the price of the end-product so much as to make it non-competitive. Processes must show that there is at least some competitive advantage as compared to alternatives.

Additionally, the cost prong need not be limited to end-products. Inventions that aid in the distribution, delivery, or manufacture of end-products so as to reduce market prices could be considered commercially useful.

The doctrinal test is theoretically elegant. It draws on the intersection of supply and demand that leads to a market clearing price. In that sense, commercial utility comes closest to the economic definition of utility, here measured by consumer surplus. Consumer surplus is the difference between the amount consumers are willing to pay for a good and the price they actually pay. The first prong of the test represents the amount consumers are willing to pay, and the second prong represents the price that suppliers are willing to accept. Thus, inventions that increase consumer surplus by increasing demand (that is, increasing the quantity consumers are willing to buy at a given price) or supply (that is, increasing the quantity sellers are willing to produce at any given price) should be commercially useful.

However, despite the apparent elegance of the two prong standard, positive consumer surplus—even if one could master the difficult task of defining and measuring a market—cannot replace the doctrinal test suggested here for two reasons. First, supply is traditionally based on marginal cost, but new inventions may require high fixed costs that preclude commercial sales at any price. Even so, the patentee will always argue that she is willing to supply the product at a high price. Second, a few people will usually be willing to pay high costs for new products. As a result, there will almost

always be *some* consumer surplus so long as one person is willing to pay more than the marginal cost of a good.

Thus, the more general “sufficient people willing to buy at a reasonable cost” test must be used. Further, evidence presented to satisfy the test must be objective to avoid unsupported subjective claims about market demand and production capabilities. While the commercial utility test requires de minimis utility, it does require both sufficient profit expectations by a reasonable producer to justify recovery of fixed costs and market demand of more than a handful of people. Otherwise, the test would be rendered illusory. Even if objective, the evidence may still be difficult to judge. Hence, the difficult practical question, then, is determining whether enough transactions are expected to satisfy the two prongs. That is, even if more than one potential sale is required, a few wealthy people might be willing to spend a large sum of money to purchase some expensive products; there was a time thirty years ago when video cassette recorders cost more than \$1,000.

Nonetheless, difficulty in applying a standard should not stand in the way of important policy. Obviousness, for example, is notoriously difficult to apply, yet it is one of the more important patent quality standards available to the PTO and the courts.

There are two responses to these evidentiary concerns that might allow commercial utility to be at least as effective as obviousness. First, many inventions simply cannot be built at a price that even the wealthiest individuals will pay, especially where fixed costs and input costs are very high. These are the easy cases, and accepting this as a rule might provide sufficient benefits (even if it would allow too many patents) because it would keep administrative costs lower. There are other bright lines that might be drawn, but each is likely to be unsatisfying for one of several reasons. In general, any fixed rule will likely be either over- or under-inclusive and disconnected from business realities for some technologies.

Second and alternatively, the PTO and courts can make determinations based on the type of technology, the state of the art, and the evidence available on a case by case basis. For example, some consumer product inventions might be commercially useful at a high cost, while a component used in such systems might only be commercially useful at a much lower cost. The determination would be based on manufacturing, distribution, and alternative technologies for each invention.

This sort of standard would be more costly to apply, but would also allow for much better accuracy than any particular rule—especially because a fixed rule might be impossible to design.<sup>236</sup> Thus, a standard would be most appropriate where the benefits of denying commercially worthless patents and encouraging early commercialization outweigh the administrative costs of a discretionary standard. These benefits and costs are discussed further below.

In any event, either a standard or a rule would still be subject to de minimis evidentiary requirements. However, the required quality of evidence might be tweaked to achieve optimal incentives. For example, the PTO or courts might accept inventor declarations based on reasonable expectations about market demand and manufacturing costs. Alternatively, they might require detailed and substantiated market research and manufacturing bids to prove commercial potential. In either case, the amount of commercial usefulness required for patent eligibility would be the same, but acceptance of the proffered evidence might be more difficult in the latter case. This is similar to current evidentiary standards for practical and operable usefulness. Pharmaceuticals require different evidence than mechanical inventions because of the different types of technologies involved and the credibility of evidence that a claim will operate as described.

Alternatively, because there are two prongs to the standard, the quality of evidence might be considered on a sliding scale. Highly credible evidence of demand might forgive undeveloped evidence of manufacturing potential. Speculative evidence of demand might be acceptable if low manufacturing cost can be proven. A sliding scale seems reasonable—if a product can be made extremely inexpensively, then arguably some number of people will be willing to buy it, making it commercially useful, even if barely.

By using a standard and varying the quality of evidence required, policy makers can control the amount of incentives inventors have to develop information about either the demand or the manufacturing prong (or both).<sup>237</sup>

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236. See generally Tun-Jen Chiang, *The Rules and Standards of Patentable Subject Matter*, 2010 WIS. L. REV. (forthcoming) (discussing rules versus standard debate for allowing patents).

237. Merges & Nelson, *supra* note 140, at 873 (“The real problem is not controlling overfishing, but preventing *underfishing* after exclusive rights have been granted.”).

However, care must be used to avoid requiring too much. If the barriers to patenting in an area become too great, inventive research may be channeled into other areas. This may be a desired outcome in some technologies, but in others it may dissuade valuable research that might eventually become extraordinarily valuable. At some point, pushing the commercialization incentive too far may cause abandonment.

Further, requiring too much evidence could transform a de minimis requirement into a less preferred “working requirement,” which requires the patent owner to practice the invention.<sup>238</sup> In this context, a working requirement would mandate that the invention already be in production prior to patentability. Such a rule would conflict with the on-sale and public-use bars, which deny patents covering inventions put to use more than a year prior to filing. The conflict is exacerbated if the inventor desires a foreign patent, as most foreign jurisdictions either forego or limit the one year grace period and disallow many patents which are in use prior to the filing date.<sup>239</sup> Furthermore, in addition to diverting research into other areas, a working requirement might delay any remaining patent filings too much. The discussion below addresses the costs of delaying patent filings.

## *2. Doctrinal and practical concerns*

There are a few doctrinal and practical concerns associated with the proposed commercial usefulness requirement. For example, commercial utility might cause some doctrinal confusion with the “will it work” prong of operable utility and “immediate benefit” prong of practical utility. However, this confusion need not undermine the new requirement. Operability should not be confused with commercialization.<sup>240</sup> Operability requires only that the claimed invention work in the abstract, while commercial utility would

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238. Kurt M. Saunders, *Patent Nonuse and the Role of Public Interest as a Deterrent to Technology Suppression*, 15 HARV. J.L. & TECH. 389, 437 (2002) (explaining Article 5 of the Paris Convention, which allows member governments to force the use of a patent in order to “protect intellectual property from being suppressed or neglected . . . simply because the owner is unwilling or unable to exploit it.”).

239. Takenaka, *supra* note 180, at 626–27.

240. Most commercialized inventions must be operable, but not necessarily. A perpetual motion machine might have market demand but fail to operate with respect to the novel aspects of the invention.

require it to be reproduced and distributed cheaply enough so that a market will likely form.<sup>241</sup> Take, for example, a pharmaceutical patent. In vitro tests are sufficient to show operable utility but may not be sufficient to show that the product can be manufactured. Instead, the inventor would have to show that the compound at issue is similar to other compounds that can be manufactured. Presumably, this would be relatively easy to show.

Additionally, there may be more overlap between market demand and practical utility. Preliminary product testing sufficient to show practical utility's immediate benefit may also support a finding of commercial utility's market demand. This is almost certainly true in pharmaceuticals, but may not be true for the dishwasher/dining table combination,<sup>242</sup> where there is undeniable practical benefit, but where people may not be willing to pay for such benefit.

Showing consumer demand is further complicated by the train paradox. Proverbial railroad officials must decide if there should be a noon train. To find out, they visit the platform at noon. Surprisingly, there are no customers waiting at noon, and the officials conclude that there is no demand for a noon train. The paradox, of course, is that passengers will not visit the train station if there is no train scheduled.

Similarly, consumers may not know enough about a new product to know that they would be willing to pay for it. This is especially true of some of the most important inventions that change the way we look at the world, such as polypropylene or even the television.<sup>243</sup>

These practical difficulties in showing demand need not be a detriment to the test. As discussed further below, market research can generate important information, and patents currently do not protect investments in such research. The commercial usefulness requirement treats inventions—especially pioneering ones—as incomplete until the threshold is met. Thus, inventors must research

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241. *Electro-Dynamic Co. v. U.S. Light & Heat Corp.*, 278 F. 80, 85 (2d Cir. 1921) (explaining the invention is operable even though it had not been put to any commercial use); Machin, *supra* note 63, at 448 (“Evidence of commercial success will frequently provide evidence of utility, but commercial failure will never be evidence of a lack of utility.”). *But see Utility Requirement*, *supra* note 5, at 165–66 (discussing cases where commercial failure was evidence of inoperability).

242. U.S. Patent No. 5,687,752 (filed Nov. 15, 1995).

243. Kitch, *supra* note 123, at 272 (discussing television patented in 1905 and commercialized in 1940).

and develop inventions to the point that consumers would demand them prior to filing for a patent. This would allow inventors to capture otherwise unprotected value in developing a new market by extending the patent term.<sup>244</sup>

Furthermore, because the invention is not considered complete until commercial usefulness is known, such market research would be considered pre-completion “experimental use” in order to avoid patent invalidation due to public disclosure of the invention prior to seeking a patent.<sup>245</sup> By allowing patents despite traditionally invalidating market research, companies will have more of an incentive to conduct such important commercialization activities.

The dishwasher/dining table<sup>246</sup> and calendar underwear<sup>247</sup> discussed above can illustrate the commercial utility test at work. Evidence that the table could be manufactured at a reasonable price might be difficult to come by. The dishwasher would require insulation all around it, as well as a variety of different panels to match specific table materials. Manufacturing is not the primary problem, however. Rather, it would likely be difficult to show demand for the table. Aside from the basic shortcoming that nobody wants such an apparently silly invention are the costs associated with actually installing the table. Not only would the dishwasher be more expensive than under-counter dishwashers due to materials, but it would require both plumbing and power in the floor at the location of the table, which would significantly limit acceptance. While market demand may sometimes be unpredictable, the threshold is low enough that marginally commercial inventions should pass muster. The dishwasher likely would not, however, absent some evidence to the contrary.

On the other hand, the calendar underwear could likely be manufactured easily. However, such manufacturing would certainly cost more than competitive (standard) underwear, including decorative “day of the week” panties. The question is whether there is a critical mass of consumers that would want to pay sufficiently more for underwear with a calendar. This is especially difficult where

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244. Abramowicz & Duffy, *supra* note 165, at 409–10.

245. *In re Smith*, 714 F.2d 1127, 1137 (Fed. Cir. 1983) (explaining that carpet fresh patent was invalid due to public market testing).

246. '752 Patent.

247. U.S. Patent No. 5,606,748 (filed Jan. 29, 1996).

actually keeping track of the date requires looking at or wearing dirty underwear (presumably, the calendar markings described in the patent would be lost in the wash) and because viewing the date requires disrobement (the calendar must have a use other than decoration). The inventor might overcome these burdens by showing, for example, that the calendar is implemented in such a way that it does not lose value in the washing machine.

### *C. Benefits and Costs of Commercial Utility*

Implementing a commercial utility standard would provide many benefits but would also bring offsetting costs. On the whole, the new standard should promote social welfare, though this conclusion is not beyond debate.

#### *1. Potential benefits*

The benefits of a commercial utility requirement are manifold. First, costly and uncertain commercialization efforts<sup>248</sup> would be protected by the resulting patent. Such efforts would not be patentable in themselves, but they would be necessary to obtain a patent. As a result, they would be considered “experimental use,” and thus would not invalidate the patent when done before the patent filing. This has the effect of allowing patentees to file their patent applications after a longer period of development. A result of such later filing is that patent terms would last long enough for the inventor to fully commercialize the patent.<sup>249</sup> For example, later patenting allows time for necessary complementary technologies to be developed or improved before the patent expires.<sup>250</sup> In fact, the patent would be premature until such complementary technologies were available. Inventors could then better reap the rewards of the

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248. Kitch, *supra* note 123, at 276–77 (explaining that competitors can easily copy results of commercialization efforts); Nelson, *supra* note 79, at 104 (discussing the difficulties associated with turning invention into innovation); *id.* at 107–10 (explaining that companies often acquire inventions after they have been proven commercially viable).

249. Sichelman, *supra* note 2, at 366 (“[B]ecause the reward theory counsels in favor of early patenting and a limited patent term, a patent may expire well before an invention is commercially viable.”).

250. Abramowicz, *supra* note 79, at 1081 n.63 (“[I]t might not make sense to commercialize a particular invention until another, complementary invention is developed.”); Sichelman, *supra* note 2, at 366 (explaining that early patenting may lead to later commercialization).

technical and market research. Higher profits would, in turn, provide an incentive to invest in commercialization efforts.<sup>251</sup>

Second, commercialization efforts would be distinct from technical achievement associated with non-obviousness, such that both technical and commercial efforts must be made to earn a patent.<sup>252</sup> If the invention is technically non-obvious but otherwise commercially useless, it would not be entitled to a patent.

Third, the requirement would limit patentability to those inventions more likely to increase consumer welfare by satisfying a public demand.<sup>253</sup> The practical utility requirement of providing a public benefit (discussed in Part IV) would be extended to require not just the possibility of benefit, but also of one that is likely to occur.<sup>254</sup>

Fourth, patent disclosure would be improved, because patentees would know more about the invention and would face more difficulty withholding valuable information from patent applications. Inventors are required to disclose the best mode of practicing the invention.<sup>255</sup> With a commercial utility requirement, the best mode would now include commercial practice of the invention. This is information that many inventors now know, but need not disclose because only operability is required. An improved disclosure would potentially allow those learning from the patent to learn not just how to make an invention, but also ways to manufacture in quantity, market, and distribute the invention, all of which would be necessary to show commercial usefulness.

Fifth, patent claims would be more concrete, because only commercially useful claims would be patentable. It will be more difficult to show manufacturability and consumer demand for abstract claims; markets do not demand amorphous descriptions—

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251. See Abramowicz & Duffy, *supra* note 165, at 403. But see Sichelman, *supra* note 2, at 354 (“[L]ike invention itself, the risks of *commercializing* inventions regularly demand supernormal returns to justify taking them.”).

252. See, e.g., Abramowicz & Duffy, *supra* note 165, at 405 (discussing “commercialization patents” that reward commercially non-obvious advances without respect to technical novelty or obviousness).

253. Cotropia, *supra* note 73, at 76 (“If patent law required a use of a certain commercial or social worth, an inventor would need to take time to establish that her invention provides this level of benefit before filing.”).

254. Koneru, *supra* note 5, at 648 (“In a competition-oriented society, a product’s value and best use is reflected ultimately in the product’s commercial success.”).

255. 35 U.S.C. § 112 (2006).



they demand products. This might spur future innovation developing commercializable embodiments of the abstract concepts taught by the patent and minimize the first inventor's ability to block future products that were not within its initial development.<sup>256</sup>

A related result is that commercial utility should lessen concerns about patentees claiming a broader claim scope than they invented. To be sure, claim scope will always be an important concern and the type of utility required will affect claim scope. But claim scope would be more directly affected by usefulness, making it easier to invalidate broad claims than might be possible with enablement or written description doctrine alone.<sup>257</sup> Those desiring broad, generalized claims would have a more difficult time showing commercial utility of all the potential products that might fall under a broad scope. Future products that might technically fall within the claim may be well beyond what can be manufactured at the time of patent filing. Thus, the emphasis would be on the commercial usefulness of the claim rather than the inventor's attempt to claim more than has been invented. Further, to show commercial usefulness, the inventor would have to expend more effort actually inventing the broader claim scope.<sup>258</sup>

## 2. *Potential costs of commercial utility*

The commercial utility standard would also create several offsetting costs. For one, commercial utility is difficult to observe, which increases administrative costs.<sup>259</sup> However, such costs should be offset to some extent by a reduction in the number of patent

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256. Merges & Nelson, *supra* note 140, at 909 (pioneering patents are costly, especially when overbroad). *But see* Oddi, *supra* note 90, at 1117 (revolutionary inventions are the "most important class of patent-induced inventions.").

257. Sichelman, *supra* note 2, at 356 ("[D]espite the black-letter rule that an inventor 'can lawfully claim only what he has invented and described,' courts and the Patent Office typically allow patent claims that are of much broader scope than what is actually disclosed in a patent application." (citation omitted)).

258. *See* Merges & Nelson, *supra* note 140, at 909 (discussing the problems associated with patent applications that have an overly-broad scope).

259. Koneru, *supra* note 5, at 648 ("In a competition-oriented society, a product's value and best use is reflected ultimately in the product's commercial success. That the patent office is not in the best position to predict the practical utility of every invention is evident from the fact that of the thousands of patents issued each year, only a fraction of them are commercially successful.").

applications, presumably because fewer people would seek protection for commercially useless inventions.<sup>260</sup>

Then again, fewer applications are not necessarily a good thing; because most patent applications are published, more filings expand knowledge in the public domain even if no patent results.<sup>261</sup> These patents might increase public knowledge even if they do not promise commercial benefits.

More important, the standard would thwart the filing of patents that are not yet commercially valuable, but might be in the future.<sup>262</sup> Of course, this delay is the purpose of the commercial utility requirement, but delay may be costly nonetheless.

The magnitude of the cost of delaying (and potentially eliminating) future-commercializable patent filings depends on a variety of factors. One factor is the extent to which delay increases the cost of inventing and patenting, which reduces the ex ante incentive to invent.<sup>263</sup> Determining whether this results in a net social cost is a difficult question, because the reduced incentive may primarily eliminate worthless inventions.<sup>264</sup> Additionally, it may be optimal to reduce investment in particular types of inventive activity.

Another factor is the extent of independent inventor patenting. Independent inventors often lack commercialization capacity or the resources to find and test the data necessary to show commercial utility. If independent inventors contribute important knowledge through patents,<sup>265</sup> then making such patents unattainable may

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260. Cf. Cotropia, *supra* note 73, at 124 (“More invention information and greater resource investment prior to examination reduces the number of conceived ideas that turn into examined patent applications.”).

261. Michael Risch, *The Failure of Public Notice in Patent Prosecution*, 21 HARV. J.L. & TECH. 179, 217 n.218 (2007) (explaining that published applications of rejected patents adds to the searchable prior art).

262. Eggert, *supra* note 70, at 781 (arguing that inventors often file before they know what the commercial utility of the product will be); Koneru, *supra* note 5, at 648–50 (explaining that patent examiners cannot know what future value inventions will have).

263. Sichelman, *supra* note 2, at 374–75 (delayed patenting reduces ex ante incentive to invent).

264. See, e.g., *id.* at 371 (“Although waiting to commercialize a patented invention will reduce the amount of potential supernormal profits redounding to the patentee’s benefit, it will also reduce the supernormal risk that a patentee will make the wrong choice—namely, commercializing a valueless invention.”).

265. Christopher A. Cotropia, *The Individual Inventor Motif in the Age of the Patent Troll*, 12 YALE J.L. & TECH. 52, 58 (2009) (“[I]nvocations of the individual inventor motif in patent discourse are the product of the collective belief in the narrative itself: that small inventors are crucial to technological innovation . . . .”); Merges & Nelson, *supra* note 140, at

decrease the benefit of that knowledge. This cost is exacerbated to the extent that small companies must have patent filings to obtain capital investments,<sup>266</sup> without such funding the number of innovating firms will decrease. If, however, small and independent inventors provide little additional inventive benefits and instead large companies simultaneously develop most inventions,<sup>267</sup> then discouraging independent invention may be an acceptable cost.

The fact that many inventions may hit the market without independent inventors answers concerns that a commercial utility standard might unfairly favor larger companies that can afford to spend money marketing an invention. While it may be true that companies with deep pockets will have an advantage in obtaining patents, if the goal of the system is bringing new inventions to the market then social welfare may be best served by putting patents into the hands of companies most likely to commercialize them.<sup>268</sup> In any event, evidence shows that most inventions today are developed by larger companies.<sup>269</sup>

The independent inventor factor extends to a more general factor—the value of disclosure of non-commercial inventions generally. A commercial utility requirement leads to later patenting, which leads to later disclosure.<sup>270</sup> Patents—especially revolutionary ones—include many important technical contributions that cannot be commercialized for reasons unrelated to the inventor, such as expensive or unavailable companion technology.<sup>271</sup> As discussed above, delaying patenting until such companion technology is available can spur commercialization. However, to the extent one believes that early disclosures add to public knowledge, then delaying

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873; Nelson, *supra* note 79, at 108–09 (discussing research and development by small companies).

266. Perryman & Setty, *supra* note 113, at 512.

267. JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 168 (2008) (explaining that benefits of small inventors depends on the type of inventor, but in general small inventors are not inventing highest value inventions).

268. Sichelman, *supra* note 2, at 397 (proposing commercialization patents that allow protection for parties that commercialize inventions).

269. BESSEN & MEURER, *supra* note 267, at 168.

270. Kitch, *supra* note 123, at 270 (explaining that a commercial utility requirement would delay patent applications).

271. Regulatory approval, such as FDA approval, should not affect the commercial utility; the question of whether a drug could be manufactured at a price people are willing to pay is unrelated to whether the government will allow the drug to be sold.

patenting would deprive others of the ability to learn from the disclosure and develop related technology.<sup>272</sup>

Even if disclosure value is disregarded, delaying the patenting of commercially non-viable inventions will lead to later expiration dates of such technology. This is problematic under the premise that many basic inventions would not be fully exploited for many years;<sup>273</sup> a longer patent term may delay commercialization even longer because only the owner could exploit the patent. Then again, those inventions might be fully exploited earlier if they were covered by patents at a more commercially relevant (though later) time.

A final factor in the cost of delayed patents is the effect on concurrent races to invent. Delayed patent filings may extend duplicative patent races. If simultaneous research is considered inefficient,<sup>274</sup> then delaying the patent even further will extend the inefficiency.<sup>275</sup> Thus, under rent dissipation theory, one wants to end the patent race as soon as possible, because delaying patenting will cause waste by allowing inventors to seek solutions simultaneously.<sup>276</sup> Further, a commercial utility requirement would exacerbate duplicative costs because the commercialization adds more uncertainty and cost to the process,<sup>277</sup> and only one person reaps benefits from expending such costs.

On the other hand, patent race concerns are overrated for three reasons. First, many races would occur in secret anyway, and to the extent the races are simultaneous, at least eighteen months of time will pass before one inventor learns of a patent filing by another,<sup>278</sup> if they ever do.<sup>279</sup> Second, in many cases the inventor is the only person

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272. Oddi, *supra* note 90, at 1129–30 (explaining that expanded utility requirements decrease incentives to create revolutionary inventions).

273. Kitch, *supra* note 123, at 272 (providing a list of patented technology and describing the lengthy time to commercialization).

274. Merges & Nelson, *supra* note 140, at 870–71.

275. Kitch, *supra* note 123, at 271 (explaining delay limits prospect features of the patent system); Cotropia, *supra* note 73, at 125 (arguing that delay reduces prospect benefits of patents).

276. Grady & Alexander, *supra* note 121, at 320–21.

277. Cotropia, *supra* note 73, at 125–26 (“[Delay] increases the cost of patenting, forcing an inventor to both expend resources and engage in uncertain research without the security of patent protection”); Grady & Alexander, *supra* note 121, at 339.

278. 35 U.S.C. § 122(b) (2006).

279. See generally Christopher A. Cotropia and Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421 (2009) (explaining that most infringers are unaware of patents covering their products).

working on the invention and there really is no race (though the inventor might not know he or she is the only one looking for a solution). If there is no race, benefits are maximized if the law provides an incentive to commercialize. Third, the race may lead to different beneficial solutions, which is good for competition and innovation.<sup>280</sup>

## VI. CONCLUSION

This Article is a new look at an old and neglected doctrine. This Article has attempted to reinvigorate the usefulness doctrine by clarifying what utility means, how and when it should be measured, and showing how it might be used to achieve maximum commercialization of inventive activity. Understanding the three categories of utility—operability, practicality, and commerciality—as well as understanding the importance of how usefulness affects the timing of patents sheds light on how usefulness can be used to channel inventive activities.

Some may find it surprising that a seemingly new doctrine—practical utility—is actually quite old. Its importance is clear: to drive inventive activity away from basic science and toward commercialized applications. By denying patents on discoveries that have no practical benefit to society, researchers may be more likely to focus on applied inventions that can be commercialized.

Some practical application is not enough, however. The newly proposed commercial utility standard attempts to weed out patents that will never have commercial value, and to incentivize investments in other inventions that require more development to be commercialized. The standard—like practical utility—is also older than one might think, and neglect may be a primary reason such a standard has not been effectively utilized.

The net social benefit of the proposed commercial utility standard is unanswered here and may be unanswerable without much more data—likely unobtainable data. The result also likely varies by industry. Depending on one's outlook on what factors drive

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280. Koneru, *supra* note 5, at 645; Merges & Nelson, *supra* note 140, at 873 (“Consequently, one might expect that many independent inventors will generate a much wider and diverse set of explorations than when the development is under the control of one mind or organization.”); Cotropia, *supra* note 73, at 86 (“Two companies may be attempting to solve a given problem and, at the end of the race, produce two viable solutions.”).

innovation, commercial utility should provide a social benefit. Thus, areas of future research and debate might focus on the timing of commercialization in different industries, which types of inventions are sought by parallel efforts, and the effect of commercialization rules on pioneering inventions.

Even without a firm answer, this Article points to the questions that should be asked and the policy that should be considered. It also demonstrates that adjusting usefulness can help maximize the commercialization of patents while minimizing the costs of valueless patents.

