PATENT LAW'S PHILOSOPHICAL FAULT LINE

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Under the conventional view, utilitarian theory has come to dominate patent law. Patents are viewed as the incentive we offer for innovation, from which all of society ultimately benefits, despite short-term monopoly costs. Patent doctrines are, in turn, assessed against the goals of optimizing that incentive and reducing those costs. On the other side, a minority of embattled jurists and scholars defend the relevance of freestanding moral principles, such as desert, autonomy, or justice, and argue for their re-incorporation into contemporary patent doctrine and policy. This Article challenges the conventional terms of this debate by offering a unique reframing: a resilient thread of moral principles does remain woven into patent law, but largely only in one half of the tapestry. Whereas utilitarian theories generally do an excellent job of explaining modern patent *validity* law, many of the core doctrines in patent *infringement* law are heavily influenced by broad moral principles—and sometimes even hostile to a traditional economic approach.

The Article examines in detail the most significant doctrines governing patent validity—novelty, non-obviousness, subject-matter eligibility, utility, written description, enablement, and inventorship—and demonstrates the strength of their relationship to utilitarian frameworks at the (often explicit) expense of others. The Article then explores the most significant doctrines with respect to patent infringement—relief (whether injunctive or damages), scope (vis-à-vis the doctrine of equivalents), and defenses (inequitable conduct and prior use)—and builds the case that reference to non-utilitarian, moral frameworks is often needed to explain their contours. This fault line, the article argues, can likely be traced to three interrelated causes: the adjudicatory split between the USPTO and district courts, the influence of traditional property law, and the mix of private-law and public-law features that patents exhibit. Finally, the article concludes by briefly examining the implications for policymakers, using two case studies of reform efforts: patents on surgical techniques and plants.

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INTRODUCTION

By almost any metric, utilitarianism has conquered the field of American intellectual property scholarship[1]—and nowhere more

1. *See, e.g.*, PETER S. MENELL, MARK A. LEMLEY, & ROBERT P. MERGES, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE: 2017, at 16 (2017) ("Utilitarian theory and the economic framework built upon it have long provided the dominant paradigm for analyzing and justifying the various forms of intellectual property."); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY 4 (2003) ("Today it is acknowledged that analysis and evaluation of intellectual property law are appropriately conducted within an economic framework that seeks to align that law with the dictates of economic efficiency."); Edwin C. Hettinger, *Justifying Intellectual Property*, 18 PHIL. & PUB. AFF. 31, 47 (1989) ("[T]he strongest and most widely appealed to justification for intellectual property is a utilitarian argument based on providing incentives."); *Mazer v. Stein*, 347 U.S. 201, 219 (1954) ("The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare . . . .").

absolutely than patent law.[2] Whether measured by citations and readers[3] or direct influence on federal policy,[4] the unambiguously dominant lens with which to analyze, adjudge, and justify our patent system is economics, in the ultimate service of efficiency and growth.[5] Alternative theories of natural law, personhood, or social justice occupy a decidedly secondary status in the patent field, particularly when compared to other fields such as copyright law,[6] or foreign systems such as the European Union.[7] U.S. patent scholars that do work in

2. *See, e.g.*, MENELL, LEMLEY, & MERGES, *supra* note 1 at 36 ("Patent law is the classic example of an intellectual property regime modeled on the utilitarian framework."); MARTIN J. ADELMAN, RANDALL R. RADER, & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 33–46 (4th ed. 2014) (describing "[t]he literature relating the patent system to economic theory" as "enormous," and giving primacy to those justifications); CRAIG A. NARD, THE LAW OF PATENTS 2 (2008) ("Our patent laws operate as part of an interdependent mix of incentives and restraints . . . offering a potential financial reward as an inducement to invent, to disclose technical information, to invest capital in the innovation process, and to facilitate efficient use and manufacturing of invention through licensing.").

3. For example, in Professors Fred Shapiro and Michelle Pearse's most recent comprehensive survey of law review citations, articles in the utilitarian tradition are the sole representatives for the field of patent law. *See* Fred R. Shapiro & Michelle Pearse, *The Most-Cited Law Articles of All Time*, 110 MICH. L. REV. 1483, 1500 (2012). A review of the most cited articles regarding "patents" on SSRN yields similarly homogeneous results—thanks in part to the (telling) preeminence of the National Bureau of Economic Research. SSRN, *Top 10,000 Papers*, https://hq.ssrn.com/rankings/Ranking_display.cfm?TRN_gID=10.

4. Fittingly enough, the U.S. Patent and Trademark Office is subordinated within the Department of Commerce—the agency responsible for "promot[ing] job creation and economic growth." DEP'T OF COMM., *About Commerce*, https://www.commerce.gov/about [https://perma.cc/AXA6-L98W]; *see* 35 U.S.C. § 2 (2012). Likewise, perhaps the most significant study of the patent system ever undertaken by the federal government was itself wholly economic in nature. S. SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHT, COMM. ON THE JUDICIARY, 85TH CONG., 2d Sess., *An Economic Review of the Patent System* (Comm. Print 1958).

5. *See, e.g.*, A. Samuel Oddi, *Un-Unified Economic Theories of Patents—The Not-Quite Holy Grail*, 71 NOTRE DAME L. REV. 267, 269 (1996) (describing "natural law/justice based theories" of the patent system as "classical theories," no longer represented in the modern era); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265, 266 (1977) (describing "[t]he conventional view of the patent system" as "a device that enables an inventor to capture the returns from his investment in the invention").

6. *See, e.g.*, Wendy J. Gordon, *Moral Philosophy, Information Technology, and Copyright: The Grokster Case*, *in* INFORMATION TECHNOLOGY AND MORAL PHILOSOPHY 270 (2008); Wendy Lim, *Towards Developing a Natural Law Jurisprudence in the U.S. Patent System*, 19 SANTA CLARA COMPUTER & HIGH TECH. L.J. 561, 562 (2002) ("Perhaps due to the fact that copyrights are more readily linked to First Amendment rights of speech, copyright law has generated some discussion on natural rights and natural law-type theories.").

7. *See, e.g.*, MENELL, LEMLEY, & MERGES, *supra* note 1, at 5–6 ("Natural rights are strongly emphasized in the continental European justifications for intellectual property. . . . Continental scholars emphasize the importance of reputation and

these moralistic traditions, however excellent, tend to acknowledge their relatively embattled and minority position.[8] Their work, moreover, tends to focus on particular issues or *deviations* from moral theory that patent law presents,[9] rather than proposals for unifying positivistic theories of patent law as economists have.[10]

The dominance of utilitarianism in American patent law is, to a point, justified by the long arc of patent history[11] and constitutional text

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noneconomic aspects of intellectual property . . . ."); ROBERT P. MERGES, JUSTIFYING INTELLECTUAL PROPERTY 94 (2011) ("[I]n everyday IP scholarship the labels have largely stuck: the United States is the home of a utilitarian brand of IP law; in Europe a rights-based, natural law vision predominates.").

8. *See, e.g.*, MERGES, *supra* note 7, at 1–3; Emily Michiko Morris, *Intuitive Patenting*, 66 S.C. L. REV. 61, 106 (2014) ("[M]orality and ethics based objections are more the exception to the rule than the rule . . . as the U.S. patent system has remained mostly agnostic about morality and ethics."); Lim, *supra* note 6, at 562 ("[P]atent law seems to be a poorer cousin as far as any discussion on natural rights or natural law jurisprudence is concerned."); Adam Mossoff, *Rethinking the Development of Patents: An Intellectual History, 1550-1800*, 52 HASTINGS L.J. 1255, 1257 (2001) ("It is my intention, nonetheless, to offer a modest challenge to the prevailing view . . . ."); Eric R. Claeys, *On Cowbells in Rock Anthems (and Property in IP): A Review of Justifying Intellectual Property*, SAN DIEGO L. REV. 1033, 1035 ("Most IP scholars tend . . . to be skeptical that . . . noneconomic theories of intellectual property have much explanatory power or significance.").

9. *See, e.g.*, Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1535, 1608 (1993) ("Current intellectual property systems give rights in excess of what a Lockean model would justify."); Jay Erstling, *Using Patents to Protect Traditional Knowledge*, 15 TEX. WES. L. REV. 295 (2009) (describing problems—and solutions—with leveraging the patent system to protect the moral interests in traditional cultural knowledge); MERGES, *supra* note 7, at 271–87 (addressing moral problems with the patent system vis-à-vis lifesaving drug access in the developing world, and pointing primarily to voluntary, extra-legal solutions such as NGO efforts).

10. *See, e.g.*, sources cited *supra* note 5; Eric R. Claeys, *Intellectual Property and Practical Reason*, 9 JURISPRUDENCE 251, 251 (2018) (using Lockean theory to explain the novelty requirement in patent law, among others). Professor Merges's book in particular is a singularly compelling (and, in the author's view, highly persuasive) attempt to map broad moral principles onto a justification for intellectual property writ large, but it does not make the claim that those principles necessarily explain the specificities and realities of current *doctrine*—let alone patent law doctrine in particular. *See generally* MERGES, *supra* note 7.

11. Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents* (Part 1), 76 J. PAT. & TRADEMARK OFF. SOC'Y 697, 699 (1994) ("Patent law systems and patent systems developed out of a realization that there was indeed a societal need to recognize and protect a property right in invention . . . although for reasons having very little to do with any perceived 'natural law' right."); Hebert Hovenkamp, *The Emergence of Classical American Patent Law*, 58 ARIZ. L. REV. 263, 266–67 (2016) ("Historically, Supreme Court decisions interpreting both the Contract Clause and Patent Clause considered whether government-created exclusive rights could be used to encourage development. . . . The states issued exclusive rights in corporate charters and for patented inventions more of less interchangeably. . . . American legislatures and courts conceived of the patent as an active tool of economic development."). Or, to go beyond the United States' own

alike: "The Congress shall have Power . . . *To promote the Progress of Science and useful Arts*, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[12] Or, per *Federalist No. 43*: "The *utility* of this power will scarcely be questioned. . . . The *public good* fully coincides . . . with the claims of individuals."[13] Little wonder then that, when signing the most comprehensive patent reform legislation in years, President Barack Obama couched the action entirely as a matter of sound utilitarian policy: "This much-needed reform will speed up the patent process so that innovators and entrepreneurs can turn a new invention into a business as quickly as possible. . . . Here in America, our creativity has always set us apart, and in order to continue to grow our economy, we need to encourage that spirit . . . ."[14] But, as the moral critics are quick to point out, this line of reasoning has critical limits, and unexplained gaps.[15]

This Article offers a novel and dissenting, but unifying, account of the clashing utilitarian and moral frameworks on patents. At a doctrinal level, the true story of patent law is not one of absolute utilitarian conquest or moral defeat. Instead, there appears to be a fault line in the middle of the law, between validity and infringement. The typical utilitarian theories do an excellent (and near-exclusive) job of explaining the core elements of modern patent *validity* doctrine, but the rules governing patent *infringement* retain an unmistakable thread of broader moral principles. The utilitarians thus overstate their assets to some degree, whereas the moralists underestimate their own considerable foothold—one only needs to look in the right places.

The Article proceeds in five parts. Part I begins with a taxonomy of philosophical perspectives on property and, in turn, intellectual property. Unifying principles are examined among moralistic theories of natural law, personhood, and distributive justice, and contrasted against the core principles of basic economic utilitarianism. Parts II and III then apply this taxonomy to the two halves of patent law. Part II

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history, the predecessors in Venetian and, later, English law were clearly predicated on economic interests. *See generally* JOHN F. DUFFY & ROBERT P. MERGES, PATENT LAW AND POLICY: CASES AND MATERIALS 3-8 (6th ed. 2013).

12. U.S. CONST. art. I, §, cl. 8 (emphasis added).

13. THE FEDERALIST NO. 43 (James Madison) (emphases added).

14. Press Release, The White House, Office of the Press Secretary, President Obama Signs America Invents Act, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs (Sept. 16, 2011) (quoting President Obama's statements at the signing).

15. *See, e.g.*, Lim, *supra* note 6, at 562 ("I . . . argue that a utilitarian justification of the patent system is not a viable explanation."); Mossoff, *supra* note 8, at 1256–57 (arguing that the conceptual shift from patents as royally sanctioned industrial monopolies to protection for inventions was precipitated by the influence of natural law theorists—John Locke in particular—rather than utilitarian thinkers).

examines the most significant doctrines governing patent validity—subject-matter eligibility, utility, novelty, nonobviousness, written description, enablement, and inventorship—and demonstrates the strength of their relationship to utilitarian principles at the expense of others. Part III, in turn, examines the most significant rules with respect to patent infringement—relief (whether damages or injunctive), scope (vis-à-vis the doctrine of equivalents), and defenses (inequitable conduct and prior use)—and builds the case that reference to non-utilitarian, moral principles is often needed to explain their contours. Part IV offers a modest theory as to the interrelated causes of this particular validity-infringement fault line, pointing to: the adjudicatory split between district courts and the PTO; the influence of traditional property law; and patent law's private-public mix. Finally, Part V concludes with a brief look at policy effects and implications.

I. PHILOSOPHICAL TAXONOMY: WHAT DIVIDES MORAL APPROACHES TO PROPERTY FROM EACH OTHER AND FROM UTILITARIANISM

Before addressing patent doctrine directly, it is necessary to establish what is meant by moral approaches to property as distinguished from utilitarian law and economics. The following four sections address the most influential philosophies of ownership among common-law systems: natural law, autonomy and personhood, distributive justice, and utilitarianism. The first three of these approaches, despite their considerable differences and internal variation, share characteristics that place them in fundamental contrast to utilitarianism: a greater focus on individuals; more attention paid to questions of distribution; stronger recognition of non-economic values, such as justice, freedom, and equality; and a tendency to engage in deontology over consequentialism. Accordingly, they are grouped together as "moral" approaches to property. In turn, the characteristics that these moral approaches share (along with the inverse characteristics exhibited by utilitarianism) will form the rubric for comparing patent validity doctrine to patent infringement doctrine in Parts II and III—and serve to demonstrate the magnitude of difference between the two.

A. Natural Law and Labor Theory

A perfectly complete account of the natural law theories of ownership is, for the sake of brevity and readability, beyond the scope of this article.[16] But even a brief introduction to John Locke and labor theory will suffice. For Locke, property begins with self-ownership as

16. For a full account, the author recommends STEPHEN BUCKLE, NATURAL LAW AND THE THEORY OF PROPERTY: GROTIUS TO HUME (1991).

an axiom, as contrasted with what God conveyed to all humankind in common: "Though the earth and all inferior creatures be common to all men, yet every man has a Property in his own Person. This nobody has any right to but himself."[17] From there, Locke reasons, one must also necessarily own their own labor, it being a part or product of their owned self.[18] Accordingly, one then owns the products *of those* labors—"the apples . . . gathered" off the ground or the "land . . . till[ed]" and planted—because they have been irrevocably "mixed" with the labor (and hence, the self).[19]

Locke further justifies this theory by reductio ad absurdum; if the would-be apple owner were instead required to obtain the affirmative consent of all other potential owners—all humankind—before taking and consuming, she would starve.[20] Such an outcome, Locke reasoned, would contradict the Judeo-Christian imperative to prosper, the entire purpose of God's conveyance of the earth in the first place: "for the Support and Comfort of [humankind's] being."[21] Accordingly, it is labor, rather than mutual consent, that forms the foundation of ownership.

But this same imperative to prosper places outer limits on labor theory. Locke establishes two bounds—provisos—on ownership by labor. First, the act of taking must leave "enough, and as good, left in common for others."[22] This is often referred to as the sufficiency proviso, ensuring that ownership by one does not leave others bereft of opportunity or sustenance: "[I]n effect, there was never the less left for others because . . . he that leaves as much as another can make use of, does as good as take nothing at all."[23] Second, the act of taking must be limited to what the individual can actually utilize: "As much as anyone can make use of . . . before it spoils. . . . Nothing was made by God for Man to spoil or destroy."[24] This is often referred to as the waste proviso, ensuring that ownership contributes to some end use or purpose, rather than ownership for its own hoarding sake.[25]

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17. JOHN LOCKE, TWO TREATISES ON GOVERNMENT 185 (3d ed. 1698).

18. *Id.* ("The Labour of his body and the Work of his hands, we may say, are properly his."); *id.* ("For this Labour [is] the unquestionable property of the labourer . . . .").

19. *Id.*

20. *Id.* ("And will anyone say he had no right to those acorns or apples he thus appropriated because he had not the consent of all mankind to make them his? . . . If such consent was necessary, man had starved, notwithstanding the plenty God had given him.").

21. *Id.* at 185.

22. *Id.* at 186.

23. *Id.* at 189.

24. *Id.* at 188.

25. It must be noted, however, that the introduction of money exchange—and hence unspoiled saving—undercuts the effective force of the waste proviso. "[If one]

As with physical property, labor theory thus offers an intuitive potential justification for intellectual property, including patents. In short: "What a person produces with her own intelligence, effort, and perseverance ought to belong to her and no one else."[26] Just as one might gather unclaimed apples to bake into a pie, one might gather disparate pieces of information and knowledge in the public domain, infuse them with effort and creativity, and thereby develop a new invention.[27] Though the provisos may set upper limits on the details of implementation, Locke's framework thus compels at least some measure of ownership for these diligent inventors, if only because of their hours spent toiling in the lab or field.

B. Autonomy and Personhood

Locke's labor-based framework may be contrasted to some degree against those based on expression or will. In brief, these theories recognize that our relationships to external objects both inform and support our personalities—our *selves*—in ways that may be orthogonal to labor or objective market value. A wedding ring, for example, has a particular significance for and relationship to its owner as compared to all other persons, entirely separate from its cost or the craftsman who created it.[28] Persons are bound up, in other words, by everything from homes to clothing. True self-actualization thus requires the freedom to imbue external objects with this kind of meaning, which in turn requires some mechanism of ownership. Enter: property.

Immanuel Kant provides such an articulation of property, grounded fundamentally in service of maximizing individual autonomy.[29] As Professor Merges explains:

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bartered away plums that would have rotten in a week for nuts that would last good for his eating a whole year, he did no injury; he wasted not the common stock." *Id.* at 200; *see generally* C.B. MACPHERSON, THE POLITICAL THEORY OF POSSESSIVE INDIVIDUALISM: HOBBES TO LOCKE 203, 208 (1962).

26. Hettinger, *supra* note 1, at 36 (examining, among others, the relationship between labor theory and intellectual property).

27. *See, e.g.*, MERGES, *supra* note 7, at 31–48 (supporting the fit between labor theory and establishing a system for protecting intellectual property).

28. *See* Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 959 (1982) ("These objects are closely bound up with personhood because they are part of the way we constitute ourselves as continuing personal entities in the world. . . For instance, if a wedding ring is stolen from . . . a loving wearer, the price of a replacement will not restore the status quo—perhaps no amount of money can do so.").

29. *See, e.g.*, Allen Wood, *The Final Form of Kant's Practical Philosophy*, *in* KANT'S METAPHYSICS OF MORALS: INTERPRETIVE ESSAYS (Mark Timmons ed., 2002) ("Kantian morality . . . is never about the social regulation of individual conduct. It is entirely about autonomous individuals directing their own lives.").

> People have a desire to carry out projects in the world. Sometimes, those projects require access to and control over external objects. . . . For Kant, this desire must be given its broadest scope, to promote the widest range of human choice, and therefore human projects. . . . Consider Michelangelo, approaching a large block of marble. He may have a plan, a mental picture of what he wants to do, what design he wants to impose on that chunk of rock. . . . To fully realize this vision, to work out his plan for the marble, he needs to know that he can count on two things: continued access to it, and noninterference by others.[30]

For Kant, free will is a defining characteristic of persons as compared to objects; "[w]e can dispose of things which have no freedom, but not of a being which has free will."[31] That internal free will is only reified, however, by forming intentions and acting on objects in the external world.[32] By so doing, the individual becomes connected to the object, which gives rise to what Kant defines as property: that "with which I am so connected that another's use of it without my consent would wrong me."[33]

Kant is not alone in grounding property in a theory of personhood by free will. Georg W. F. Hegel, for example, offers a similar view: "The person has for its substantive end the right of placing its will in any and every thing, which thing is thereby mine; . . . [this constitutes] mankind's absolute right of appropriation over all things."[34] In particular, Hegelian theory clarifies that will-based ownership is not necessarily durable or permanent once established; "continuous occupation is necessary to maintain a property relationship . . . because 'the will to possess something must express itself.'"[35] Moreover,

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30. MERGES, *supra* note 7, at 72–73.

31. IMMANUEL KANT, LECTURES ON ETHICS (1755-1780) (L. Infield, trans., 1963), at 124.

32. *See, e.g.*, Lewis White Beck, *A Commentary on Kant's Critique of Practical Reason* at 178 (1960) ("[Free will] has, therefore, an incentive for action . . . ."); Frederick Rauscher, *Kant's Social and Political Philosophy*, THE STANFORD ENCYCLOPEDIA OF PHILOSOPHY 15 (Edward N. Zalta, ed., 2017) ("[Ownership], then, is required by right in order for free beings to be able to realize their freedom by using objects for their freely chosen purposes.").

33. IMMANUEL KANT, THE METAPHYSICS OF MORALS 68 (Mary Gregor trans., Cambridge Univ. Press 1991).

34. GEORG WILHELM FRIEDRICH HEGEL, PHILOSOPHY OF RIGHT 41 (T.M. Knox trans. 1967) (1821).

35. Radin, *supra* note 28, at 974 (quoting Hegel, *supra* note 34, at § 64); Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 334 (1988) ("Abandonment occurs easily in the Hegelian system because the relationship between person and object is fluid. Being first in possession of an object is not sufficient to

critically, an occupation by will need not include any kind of externally visible *use*.[36]

Just as with labor theory, then, personhood suggests at least some degree of ownership for intellectual property. The creator of a distinctly original work or invention has, after all, a particularly strong claim that their will is uniquely embodied by it. Indeed, it seems difficult to imagine a more direct affront to one's projected personhood than for a plagiarist to steal credit for authorship, or a counterfeiter to distribute altered or imperfect recreations. Naturally, there is some degree of tension with respect to autonomy; propertization restricts the would-be infringer's freedom to act. But without any measure of protection, there could be no creation at all.

Kant and Hegel were, like Locke, also informed by the need for there to be enough to go around. For Kant, distributive implications arose from mutual obligation, and could at least justify the taxation of property as a functional limitation on ownership.[37] Hegel likewise acknowledged that a sufficiently lopsided distribution of property necessarily undermines autonomy: "When the standard of living of a large mass of people falls below a certain subsistence level . . . there is a consequent loss of the sense of right and wrong, of honesty and the self-respect which makes a man insist on maintaining himself by his own work and effort . . . ."[38] His proposed solutions were largely external—trade, colonization, and emigration.[39] Turning instead to John Rawls, one sees a more robust framework for relating distributive justice to property directly.

C. Distributive and Social Justice

Rawls attempted to reconcile earlier philosophers' focus on freedom with principles of fairness and equality. For Rawls, thinking properly about justice required first stepping back to a conceptual, pre-society "original position":

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maintain title to it; the property relationship continues only so long as the will manifests itself in the object.").

36. HEGEL, *supra* note 34, at 55–59; Hughes *supra* note 35, at 334–35 ("There is a rock on my shelf from the coast of Corsica that reminds me of days spent there. My will occupies that rock without wishing to change it and without having labored upon it.").

37. KANT, *supra* note 33, at 39–40; *see also* SAMUEL FLEISCHACKER, A SHORT HISTORY OF DISTRIBUTIVE JUSTICE 68 (2009) (describing Kant as "the first major thinker to argue explicitly that care for the poor ought to be a matter for the state").

38. HEGEL, *supra* note 34, at 150.

39. *Id.* at 224–25; *see generally* J.E. Penner, *Property, Community, and the Problem of Distributive Justice*, 10 THEORETICAL INQUIRIES IN L. 193, 207–10 (2009).

> [N]o one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength, and the like. I shall even assume that the parties do not know their conceptions of the good or their special psychological propensities. The principles of justice are chosen behind a veil of ignorance.[40]

Just principles for society, Rawls argued, are those that rational individuals in the original position—behind this veil of ignorance—would collectively agree upon; they are what rational and free "persons concerned to further their own interests would accept in an initial position of equality as defining the fundamental terms of their association."[41]

Rawls claimed that two clear principles would emerge under such circumstances. First, basic guarantees of liberty would be universal.[42] For example, in the original position, nobody can be sure what race, gender, or social class they will come to inhabit. Rational policymakers in such a position would not, therefore, deny basic liberties to particular subgroups.[43] Second, where "[s]ocial and economic inequalities" do exist, it must ultimately be for "the greatest benefit of the least advantaged" and "attached to offices and positions open to all under conditions of fair equality of opportunity."[44] Again, in the original position, nobody can be sure how wealthy—or endowed with marketable talents—they will be, so rational policymakers would tend to "regard the distribution of natural talents as a common asset," and "to share in the benefits of this distribution whatever it turns out to be."[45]

On this basis, Rawls developed a relatively cabined view of just property. In particular, he distinguished between personal property, which falls under the first principle of universal basic liberty, and productive property, which does not. In Rawls' view, personal property is "those belongings that are essential for an effective private, personal

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40. JOHN RAWLS, A THEORY OF JUSTICE 118 (1971).

41. *Id.* at 11.

42. *Id.* at 302 ("[E]ach person is to have an equal right to the most extensive . . . liberties compatible with a similar liberty for others.").

43. Leif Wenar, *John Rawls*, THE STANFORD ENCYCLOPEDIA OF PHILOSOPHY § 4.7 (Edward N. Zalta ed., 2017) ("A party in the original position will find the possibility that their citizen might be denied political and religious liberties intolerable . . . , when they could [instead] safeguard the standing and commitments of their citizen even if their citizen turns out to be in a weak minority.").

44. RAWLS, *supra* note 40, at 302.

45. *Id.* at 101–02.

sphere"—things for personal use, from toothbrushes to cookware.[46] Productive property, broadly speaking, is capital—the means of production, from arable land to textile mills.[47] Whereas personal property is a fundamental requirement of basic liberty,[48] "the means of production may or may not be privately owned" in a just society, so long as its distribution satisfies the second principle of benefiting the least well-off.[49]

Subsequent thinkers have taken Rawls's suggestion and used socioeconomic inequality as a framework to analyze property law and advocate for change, weighing the distributive implications of everything from the Takings Clause[50] to local zoning regulations.[51] Questions about intellectual property, in turn, likewise become questions about whether such a system benefits the least advantaged—a system with which all would agree in the hypothetical original position.[52] This approach may be contrasted most sharply with utilitarianism, the fourth and final framework discussed in this Article.

D. Utilitarianism

Jeremy Bentham offered the first and most succinct expression of utilitarianism: "[I]t is the greatest happiness of the greatest number that is the measure of right and wrong."[53] That is, Bentham "equates goodness with the sum total of pleasure (minus the pain) that people (*all* people) experience as a result of making one decision over the possible

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46. MERGES, *supra* note 7, at 105.

47. *See id.*

48. *Id.* ("Among the basic liberties of the person is the right to hold and to have the exclusive use of personal property . . . [so as] to allow . . . personal independence and self-respect . . . .").

49. RAWLS, *supra* note 40, at 66; *see also* JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT 138 (2001) (contrasting "private personal property" and the "right of private property in productive assets"); *see generally* D. Benjamin Barros, *Property and Freedom*, 4 N.Y.U. J.L. & LIBERTY 36, 57–59 (2009).

50. *See, e.g.*, Thomas W. Merrill, *The Landscape of Constitutional Property*, 86 VA. L. REV. 885, 905–07 (2000) (observing that "[i]ssues of distributive justice have dominated academic discussions about the Takings Clause in recent decades," and collecting sources); Leigh Raymond, *The Ethics of Compensation: Takings, Utility, and Justice*, 23 ECOLOGY L.Q. 577, 578 (1996).

51. *See, e.g.*, Alice Kaswan, *Distributive Justice and the Environment*, 81 N.C. L. REV. 1031 (2003); Paul H. Brietzke, *Urban Development and Human Development*, 25 IND. L. REV. 741 (1991).

52. *See, e.g.*, MERGES, *supra* note 7, at 109–21.

53. Jeremy Bentham, *A Fragment on Government; Or A Comment on the Commentaries*, *in* THE COLLECTED WORKS OF JEREMY BENTHAM 221, 227 (John Bowring ed. 1962) (1843).

alternatives."[54] Utilitarianism is, accordingly, both rigidly consequentialist and intentionally blind to broader sociocultural meaning—except insofar as it informs such "pleasure."[55]

From this goal of maximizing utility, applied as an imperative to proper governance, Bentham derives the institution of property:

> The sole object of the government ought to be the greatest happiness of the greatest possible number of the community. The happiness of an individual is greater, in proportion as his sufferings are lighter and fewer in number, and as his enjoyments are greater and larger in number. . . . [The government] fulfils this office by creating rights which it confers upon individuals: rights of personal security; rights of protection for honour; rights of property . . . .[56]

Bentham concedes that "there have always been circumstances in which a man could secure [ownership] by his own means," such as secrecy or brute strength; but, absent government enforcement, "[h]ow miserable and precarious is this method of possession!"[57] Agreement, instead, "reciprocally to respect each other's booty" is "essential to the happiness of society."[58]

Bentham's basic framework has been refined, critiqued, and expanded upon by a number of other philosophers. John Stuart Mill suggested that qualitative distinctions could, in fact, be drawn between "higher" and "lower" pleasures, with intellectual and creative pursuits counted more heavily in the utilitarian calculus.[59] Henry Sidgwick argued that one logical corollary of utilitarianism is that population growth is a moral imperative (to a point), since there will be more total pleasure being experienced: "Assuming, then, that the average happiness of human beings is a positive quantity . . . Utilitarianism directs us to make the number enjoying it as great as possible."[60] Still others, such as G. E. Moore, attempted to hybridize utilitarianism with

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54. GREGORY S. ALEXANDER & EDUARDO M. PEÑALVER, AN INTRODUCTION TO PROPERTY THEORY 12 (2012).

55. JEREMY BENTHAM, *Reward Applied to Art and Science*, *in* THE RATIONALE OF REWARD 203, 206 (1825) ("Prejudice apart, the game of push-pin is of equal value with the arts and sciences of music and poetry. If the game of push-pin furnish more pleasure, it is more valuable than either.").

56. JEREMY BENTHAM, *Principles of the Civil Code*, *in* THE WORKS OF JEREMY BENTHAM 299, 301 (Browning ed. 1843).

57. *Id.* at 308.

58. *Id.* at 309–10.

59. JOHN STUART MILL, UTILITARIANISM 14 (1863).

60. HENRY SIDGWICK, METHODS OF ETHICS, 384–85 (1874); *see generally* Julia Driver, *The History of Utilitarianism*, *in* THE STANFORD ENCYCLOPEDIA OF PHILOSOPHY § 3 (2014).

freestanding conceptions of, for example, the intrinsic good of "beauty"—a value wholly independent of utility generation.[61]

But it is Bentham's core argument that dominates the normative side of law-and-economics. Laws are justified based on the sum of their effects: minimizing inefficiencies, maximizing overall economic growth.[62] Utilitarian thinking, for example, posits that tort law should not have as its goal the prevention and punishment of *all* accidents—even some fatal ones—because beyond a certain level, care and prevention are simply more costly to society than the loss of life and limb.[63] Likewise, it is utilitarianism that justifies non-punitive breach of contract; if it is more efficient on net to break the promise rather than carry it out, reliance damages and the narrow availability of specific performance will so allow in practice.[64] The broken promise itself—however intuitively immoral—carries no valence.

In terms of intellectual property, the calculus is likewise fairly cut and dried: having a system of intellectual property is, at least in theory, better for the economy than *not* having one. Absent intellectual property rights, it would be particularly challenging for creators to seek market rewards; information is both non-rivalrous and intrinsically difficult to restrict access to.[65] The creation of new and useful things is, however, particularly beneficial for society, in the sense of positive externalities with respect to further development, growth, and innovation. A system of patent law thus offers a mechanism by which to incentivize innovation and capitalize on the overall benefits to the economy as a whole.[66] Additional influential utilitarian theories further

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61. G. E. Moore, PRINCIPIA ETHICA 132–47 (T. Baldwin ed., 1993); *see generally* Anthony Skelton, *Ideal Utilitarianism: Rashdall and Moore*, *in* UNDERIVATIVE DUTY: BRITISH MORAL PHILOSOPHERS FROM SIDGWICK TO EWING 45 (Thomas Hurka ed., 2011).

62. *See, e.g.*, ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 4 (6th ed., 2012) ("While almost all economists favor changes that increase efficiency, some economists take sides in disputes about distribution and others do not take sides.").

63. *See* GUIDO CALABRESI, THE COSTS OF ACCIDENTS (1970).

64. *See, e.g.*, JEFF FERRIELL, UNDERSTANDING CONTRACTS 715–17 (2d ed. 2009); ROBERT A. HILLMAN, PRINCIPLES OF CONTRACT LAW 140–41 (2009).

65. *See* MENELL, LEMLEY, & MERGES, *supra* note 1, at 16–23; *see generally* COOTER & ULEN, *supra* note 62, at 40–41 (discussing public goods); *id.* at 11–18 (discussing the economics of information markets in particular).

66. *See, e.g.*, Peter S. Menell, *Intellectual Property: General Theories*, *in* ENCYCLOPEDIA OF LAW AND ECONOMICS 129, 129 (Boudewijn Bouckaert & Gerrit de Geest eds., 2000) ("Utilitarian theorists generally endorsed the creation of intellectual property rights as an appropriate means to foster innovation, subject to the caveat that such rights are limited in duration so as to balance the social welfare loss of monopoly exploitation."); FRITZ MACHLUP, *An Economic Review of the Patent System*, Study No 15, Subcomm. on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, 85th Cong, 2d Sess. 33 (1958) ("The thesis that the patent system may

posit that the patent system assists in, for example, coordinating optimal investment among technological prospects[67] or preventing excessive rent dissipation.[68]

It is this utilitarian justification for intellectual property, therefore, that stands in greatest contrast to the three moral frameworks[69] outlined earlier: natural law and labor theory, autonomy and personhood, and distributive and social justice. First and foremost, observe that the moral frameworks offer a far greater focus on individuals—whether the inventor-at-issue or the hypothetical least-well-off person—rather than society or the economy as a whole. Second, when they do shift their focus onto society writ large, it is principally to examine questions of distribution, whether as a core feature of the theory (per Rawls), a formal proviso (per Locke), or a generalized outer limit (per Kant and Hegel). Third, the moral frameworks more clearly recognize non-economic values, such as justice, freedom, and equality. Fourth, and related, the utilitarian framework is most explicitly consequentialist: actions are adjudged by the state of the world that they bring about. The moral frameworks, in contrast, act deontologically, in the sense that certain actions are deemed intrinsically wrong, regardless of offsetting positive consequences—whether it's taking from the poor, or confiscating the fruit of honest labor.

The descriptions presented for each of these different philosophical frameworks are, concededly, simplified and overlook deep variation and nuance within each area. But these four broad differences ought to demonstrate that the distinction drawn herein between utilitarianism and other moral paradigms is not a matter of artifice or convenience; the two groups are speaking a different language than each other. Reifying this distinction, moreover, is the divide presented over the course of the next two Parts. That is, the core rules governing patent validity are

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produce effective profit incentives for inventive activity and thereby promote progress in the technical arts is widely accepted.").

67. *See* Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977).

68. *See* Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 305 (1992).

69. Utilitarianism is, in a certain sense, a moral framework insofar as it offers a system by which to guide conduct and judge actions as right or wrong. Nevertheless, for purposes of this Article and argument, the Author implicitly labels utilitarianism as amoral—a distinction that he is not alone in drawing. *See, e.g.*, J.J.C. Smart & Bernard Williams, UTILITARIANISM: FOR AND AGAINST 135 (1973) ("The fathers of utilitarianism thought of it principally as a system of social and political decision . . . , [not] a system of personal morality."); Thomas W. Merrill & Henry E. Smith, *The Morality of Property*, 48 WM. & MARY L. REV. 1849, 1849 (2007) ("Utilitarianism is, of course, a moral theory. But in its modern applications, based on price theory and cost-benefit analysis, it adopts a framework largely indifferent to questions of individual rights and distributive justice, which many consider the hallmarks of a moral perspective.").

better expressed and explained through resort to utilitarianism, whereas the rules governing patent infringement more frequently necessitate resort to moral theory.

II. PATENT VALIDITY – THE DOMINANCE OF EFFICIENCY

The validity of a patent rests on seven principal doctrines: novelty, nonobviousness, subject-matter eligibility, utility, written description, enablement, and inventorship. In each of those areas, there have been strong trends towards utilitarian reasoning and justification. In contrast, the relevance of freestanding moral frameworks has often been eroded over time—where it has not been abandoned altogether.

A. Novelty

The "fundamental requirement"[70] for patentability is that the invention actually be new. That is, it cannot have already been "patented, described in a printed publication, or in public use, on sale, or otherwise available to the public."[71] The precise contours of this doctrine have at times generated considerable debate—most recently, as to the proper interpretation of "on sale"[72]—but for the purposes of this Article, two broad and central principles of novelty are more than sufficient.

First, observe that the novelty requirement does not permit mutual patentability for simultaneous inventions. That is, even if multiple inventors independently make the same discovery at around the same time, only one will receive a patent—winner takes all.[73] This is not merely an academic hypothetical; empirical estimates suggest that about ninety percent of infringement suits are filed against other, independent inventors rather than out-and-out copiers.[74] Even older studies, predating the hyper-connected nature of contemporary research,

70. Mark A. Lemley, *Point of Novelty*, 105 NW. U. L. REV. 1253, 1254 (2011); *see, e.g.*, Sean B. Seymore, *Rethinking Novelty in Patent Law*, 60 DUKE L.J. 919, 930 (2011) ("A bedrock principle of patent law is that a patent cannot issue if it would remove technology that is already in the public domain.").

71. 35 U.S.C. § 102 (2012).

72. *Helsinn Healthcare S.A. v. Teva Pharmaceuticals USA, Inc.*, 855 F.3d 1356 (Fed. Cir. 2017), *cert. granted*, 138 S. Ct. 2678 (June 25, 2018). *See generally* Daniel J. Kim, *The Untimely Death of the On-Sale Bar to Patentability*, 47 U. BALT. L. REV. 439 (2018).

73. *See generally* John S. Leibovitz, *Inventing a Nonexclusive Patent System*, 111 YALE L.J. 2251 (2006).

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

likewise show the astounding prevalence of inventive simultaneity.[75] For every Alexander Graham Bell, there was an Elisha Gray;[76] for every Thomas Edison, a William Sawyer.[77] But it was only the Bells and Edisons that came away with patents.

From the perspective of labor or personhood theory, some form of shared patentability in these scenarios would seem to be clearly justified. The good-faith second inventor toiled no less than the first, and has no weaker claim with respect to her personal will or relationship to the subject matter; she only has the poor fortune of discovering—after the fact—that she was second in line.[78] From an efficiency standpoint, on the other hand, the winner-take-all rule makes perfect sense. Most importantly, it dissuades duplicative or redundant research efforts, which would tend to dissipate some (or all) of the economic benefits of invention.[79] Moreover, it drastically simplifies and consolidates the marketplace for patent sales and licensing; a would-be practitioner of the patented invention only needs to bargain with one patentee, descended from one inventor (or team)—they do not need the blessing of every independent, simultaneous discoverer.[80]

Second, the United States patent system has deemphasized the inventor in determining who is "first" for purposes of the conflicts

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75. *See, e.g.*, WILLIAM FIELDING OGBURN, SOCIAL CHANGE WITH RESPECT TO CULTURE AND ORIGINAL NATURE 90–122 (1922); William F. Ogburn & Dorothy Thomas, *Are Inventions Inevitable? A Note on Social Evolution*, 37 POL. SCI. Q. 83 (1922).

76. *See generally* David A. Hounshell, *Two Paths to the Telephone*, SCI. AM. 157–63 (1981) (describing their competing claims to the development of the telephone); MICHAEL E. GORMAN, TRANSFORMING NATURE: ETHICS, INVENTION AND DISCOVERY §§ 3.2.1–3.5 (1998) (same). To wit, Bell and Gray made their filings at the patent office on the very same day—Valentine's Day, 1876—ultimately leading to a Supreme Court dispute in which Bell emerged victorious. *See Dolbear v. American Bell Tel. Co.*, 126 U.S. 1, 567 (1888).

77. *See generally* Kevin T. Richards, *Experimentation and Patent Validity: Restoring the Supreme Court's "Incandescent Lamp Patent" Precedent*, 101 VA. L. REV. 1545, 1549–52 (2015) (describing Edison and Sawyer's inventorship dispute with respect to an incandescent electric lamp filament); Lea Shaver, *Illuminating Innovation: From Patent Racing to Patent War*, 69 WASH. & LEE L. REV. 1891, 1915–21 (2012) (same); GRAHAM MOORE, THE LAST DAYS OF NIGHT 13 (2016).

78. *See* MENELL, LEMLEY, & MERGES, *supra* note 1, at 5 ("We might distinguish between a Lockean theory of copyright, which prevents copying, and an effort to justify patent law, which precludes even independent invention and therefore restricts the labor of others.").

79. *See* Mark F. Grady & Jay I. Alexander, *Patent Law and Rent Dissipation*, 78 VA. L. REV. 310–12 (1992).

80. This likewise helps to avert potential "anticommons" issues, such as holdout through veto power. *See generally* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621–22 (1998) ("When too many owners hold . . . rights of exclusion, the resource is prone to underuse—a tragedy of the anticommons.").

described above. That is, prior to 2011, novelty was predicated on a "first-to-invent" rule.[81] As the patent statute then stated: "A person shall be entitled to a patent unless . . . another inventor . . . establishes . . . that before such person's invention thereof the invention was made by such other inventor . . . ."[82] This would, at times, lead to incredibly complex interference proceedings before the PTO—attempts to demonstrate the particular extent of progress and efforts that one inventor (or team) had made by a specific date, through research assistant testimony,[83] lab notes,[84] and even physical prototype media.[85] In 2011, however, the America Invents Act[86] shifted the patent system towards a "first-inventor-to-file" rule.[87] Put simply, "priority contests between rival claimants to an invention [are now] determined almost exclusively by looking to when each of the rivals filed their patent application."[88] The "race to the Patent Office" is on.[89]

Note that this change shifts the focus from the inventor's relationship to the patentable *invention* at a certain point in time to the inventor's relationship to the patent *application* at a certain point in time. The factors that would chiefly concern labor and personhood

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81. *See generally* MENELL, LEMLEY, & MERGES, *supra* note 1, at 194–95, 200–01; Margo A. Bagley, *The Need for Speed (and Grace): Issues in a First-Inventor-to-File World*, 23 BERKELEY TECH. L.J. 1035, 1038 (2008).

82. 35 U.S.C. § 102(g) (pre-2011); *see also* 35 U.S.C. § 135(a) (pre-2011) (establishing the procedures for interference proceedings before the PTO).

83. *See, e.g.*, *Breen v. Miller*, 347 F.2d 623, 624 (C.C.P.A. 1965) ("The witnesses were Breen himself, a research assistant, O'Brien, a research operator working under Breen's supervision, Hebeler, a research engineer, and Rivers, a research supervisor . . . .").

84. *See, e.g.*, *Kridl v. McCormick*, 105 F.3d 1446, 1448 (Fed. Cir. 1997) ("Chief among these exhibits were pages from the laboratory notebook of Marcia Vincent, who worked under Swain's supervision. On notebook pages dated January 18, 1984 . . . , Vincent described an experiment in which a gene fragment was inserted into a cloning vector . . . .").

85. *See, e.g.*, *Knorr v. Pearson*, 671 F.2d 1368, 1373 (C.C.P.A. 1982) (noting one "exhibit 24, a stud section which ha[d] visibly been subjected to a fire test").

86. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 102, 125 Stat. 284 (2011).

87. *See* 35 U.S.C. § 102 (2012) (eliminating subsection (g)); 35 U.S.C. § 135 (2012) (addressing derivation proceedings, with interference proceedings having been eliminated).

88. MENELL, LEMLEY, & MERGES, *supra* note 1, at 201; *see also* David S. Abrams & R. Polk Wagner, *Poisoning the Next Apple? The America Invents Act and Individual Inventors*, 65 STAN. L. REV. 517, 523–24 (2013) ("[In] the first-to-file system, . . . the first inventor to file his application in the relevant jurisdiction is awarded the patent. As compared to the first-to-invent approach, the evidentiary inquiry required . . . is substantially reduced—indeed, almost nonexistent.").

89. Michael A. Glenn & Peter J. Nagle, *Article I and the First Inventor to File: Patent Reform or Doublespeak?*, 50 IDEA 441, 459 (2010).

theories are, therefore, deemphasized. Old sub-rules that evoked moral desert (was the first-but-tardy inventor nevertheless "diligent" in his efforts?[90]) or ongoing relationship of will (did the first-but-tardy inventor "abandon" his pursuit?[91]) are out. A clean, bright-line rule that encourages efficiency—across multiple axes—is in. Most straightforwardly, the first-to-file rule encourages efficiency in the sense of timeliness; all else being equal, inventors are encouraged to disclose their findings to the patent office more quickly. This informs the public in general (including innovators that might build on the invention), and in particular those already engaged in similar research, again acting to minimize wasteful reduplication. As a second-order matter, the near-exclusive emphasis on filing date renders the process of validity adjudication far simpler, and less costly—no more poring over dated lab notes and R.A. testimony.[92] And finally, a third-order boon to efficiency is that the shift harmonizes the U.S. patent system with the vast majority of foreign patent systems, reducing transaction costs and misunderstandings in international trade.[93] The consequentialist concerns of utilitarianism, in other words, have gained ground at the direct expense of moral theory.

B. Nonobviousness

Even when an invention has not been "identically disclosed" in the prior art per novelty doctrine under § 102, it may still be unpatentably "obvious" under § 103 if the differences between it and the prior art

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90. *See Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998) ("Accordingly, priority of invention goes to the first party to reduce an invention to practice *unless* the other party can show that it was the first to conceive of the invention and that it exercised reasonable diligence in later reducing that invention to practice.") (emphasis added) (citing *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993)).

91. *See Tyco Healthcare Group LP v. Ethicon Endo-Surgery, Inc.*, 774 F.3d 968, 975 (Fed. Cir. 2014) ("[T]he inventor must not abandon, suppress, or conceal the invention after he or she reduces it to practice.") (citing *Dow Chem. Co. v. Astro-Valcour, Inc.*, 267 F.3d 1334, 1342 (Fed. Cir. 2001)).

92. *See* Rep. Lamar Smith & Sen. Patrick Leahy, *The Importance of Patent Reform*, POLITICO (June 15, 2011, 9:29 PM), https://www.politico.com/story/2011/06/the-importance-of-patent-reform-057029 [https://perma.cc/8LTC-W6FP] ("Our current system is riddled with patent uncertainty, inviting years of costly litigation over ownership . . . . It costs anywhere from $400,000 to $500,000, according to the patent office, to pursue an interference proceeding . . . .").

93. *See* Lisa Vertinsky, *Comparing Alternative Institutional Paths to Patent Reform*, 61 ALA. L. REV. 501, 540 (2010) ("The interest in harmonization has been driven by concerns about the complexity and cost of doing business in a global marketplace, as well as questions about the relative effectiveness and efficiency of certain U.S. rules (such as the first-to-invent approach) as compared to international norms.").

are sufficiently small.[94] For example, the invention at issue may simply be a modification of an existing reference that would be trivial to one of ordinary skill in the art,[95] or some basic combination of known elements from multiple pieces of separate prior art.[96] Naturally, the specific level of difference needed to clear § 103's bar and render an invention nonobvious is not necessarily clear from the text itself, and tends to defy quantifiable precision. Justice Story's description of patent law as "metaphysics"[97] is particularly apt here: exactly how *inventive* must an inventor be to obtain a patent?

In *Graham v. John Deere Co.*,[98] the Supreme Court simultaneously offered a lodestar on the murky matter of obviousness—and unanimously rejected non-economic considerations to boot:

> The patent monopoly was not designed to secure to the inventor his natural right in his discoveries. Rather, it was a reward, an inducement, to bring forth new knowledge. The grant of an exclusive right to an invention was the creation of society—at odds with the inherent free nature of disclosed ideas—and was not to be freely given. Only inventions and discoveries which furthered human knowledge, and were new and useful, justified the special inducement of a limited private monopoly.
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> . . .
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> The difficulty of formulating conditions for patentability was heightened by the generality of the constitutional grant and the statutes implementing it, together with the underlying policy of the patent system that 'the things which are worth to the public the embarrassment of an exclusive patent,' as Jefferson put it, must outweigh the restrictive effect of the limited patent monopoly. The inherent problem was to develop some

94. 35 U.S.C. § 103 (2012).

95. *See, e.g.*, *SIBIA Neurosciences, Inc. v. Cadus Pharmaceutical Corp.*, 225 F.3d 1349, 1358 (Fed. Cir. 2000) ("Thus, while [the prior art reference] does not expressly suggest that the cells described therein could be used in drug screening methods, the knowledge of those skilled in the art . . . suggests this modification.").

96. *See, e.g.*, *Intercontinental Great Brands LLC v. Kellogg North America Company*, 869 F.3d 1336, 1348 (Fed. Cir. 2017) ("[C]ombining the Re-Seal It packaging with familiar cookie-package frames (as in Graham) was a predictable technological solution to the relevant known market problem.").

97. *Folsom v. Marsh*, 9 F. Cas. 342, 344 (C.C.D. Mass. 1841) (Story, J.) ("Patents . . . approach, nearer than any other class of cases . . . , to what may be called the metaphysics of law, where the distinctions are, or at least may be, very subtle and refined, and, sometimes, almost evanescent.").

98. 383 U.S. 1 (1966).

> means of weeding out those inventions which would not be disclosed or devised but for the inducement of a patent.[99]

In other words, the question of obviousness—the question of denying patentability for certain innovations that are still, strictly speaking, new—hinges on a single principle: "if the invention would be created and disclosed even without patent protection, denying a patent on the innovation costs society nothing . . . and saves society from needlessly suffering the . . . restriction on output caused by a patentee's exclusive rights . . . ."[100] This inducement standard has since been frequently cited by the Federal Circuit,[101] litigators,[102] amici,[103] and scholars[104] alike, but direct reliance on it has been limited.[105] As other scholars have observed, the inducement standard by itself can be challenging and costly to implement; judges are hard pressed to answer the empirical question of when "a patent becomes necessary to induce desirable invention" in a given context.[106] Nevertheless, the Supreme Court's explicit, unanimous rejection of broader moral principles over utilitarian reasoning is another example of the dominance of utilitarian thinking—even in the abstract—on the patent validity side.

Moreover, *Graham* also set forth so-called "secondary considerations" of nonobviousness[107]: concrete, practical guideposts in adjudicating specific obviousness cases, which judges *have* relied upon heavily.[108] Secondary considerations include evidence of "commercial

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99. *Id.* at 8–11.

100. Michael Abramowicz & John F. Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. 1590, 1594 (2011).

101. *See, e.g.*, *Intercontinental*, 869 F.3d at 1346–47 (quoting *Graham*'s "but for the inducement of a patent" standard).

102. *See, e.g.*, Patent Owner's Response, *Comcast Cable Communications, LLC v. Promptu Systems Corp.* (No. IPR2018-00342), 2018 WL 4676332 (Sept. 27, 2018).

103. *See, e.g.*, Brief of the Software & Information Industry Ass'n and the Internet Ass'n as Amici Curiae Supporting Petitioners, *Samsung Electronics Co. v. Apple Inc.* (2017) (16-1102), 2017 WL 1343037 at *20–21 (Apr. 10, 2017).

104. *See, e.g.*, FED. TRADE COMMISSION, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY Ch. 1, at 11 n.74 (2003) (citing testimony from eleven law professors in support of the proposition that "patents should be granted only if the invention would not have emerged 'but for' the patent system").

105. Abramowicz & Duffy, *supra* note 100, at 1594.

106. Glynn S. Lunney, Jr., *E-Obviousness*, 7 MICH. TELECOMM. & TECH. L. REV. 363, 416 (2001); *see also* FED. TRADE COMMISSION, *supra* note 104, at 11 ("From a theoretical perspective, the 'but for' approach represents the right way to assess whether to grant a patent. It is not usually possible, however, to use a 'but for' approach to analyze whether individual patents should be granted.").

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

108. *See* Abramowicz & Duffy, *supra* note 100, at 1656 n.201 ("The courts' weight on secondary considerations is sufficiently great that the label 'secondary' can

success, long-felt but unsolved need, . . . failure of others,"[109] "skepticism of experts, [and] copying [of] the invention."[110] If others tried and failed to reach the same solution, the logic goes, how could the solution have possibly been obvious? Likewise, if previously unmet demand led to significant commercial rewards once the invention hit the market, someone would surely have stepped in earlier to fill the demand and make a buck—if it were, in fact, obvious how to do so.

These secondary considerations thus hedge against the risk of "hindsight bias," which can be quite severe in patent adjudication.[111] Even a brilliant solution can seem obvious in retrospect,[112] but secondary considerations help to ground the analysis in objectivity—specifically, a utilitarian-focused objectivity. Observe that the secondary considerations weigh more heavily towards patentability the more that an invention has been (or will be) put to widespread use, whether by large volumes of sales, industry adoption, or out-and-out copying. In contrast, obscure inventions with little use or relevance to society would be hard-pressed (at least as a practical matter) to demonstrate any of the secondary considerations, regardless of the inventive solution's *complexity* per se. In other words, these indicia collectively protect and prioritize inventions where the economic benefits to society have been greater; Bentham himself would be proud. This is in addition to the secondary considerations' tendency to map—albeit imperfectly—onto the utilitarian standard of inducement already described.[113] Where inventions were clearly difficult to develop, for

be misleading."); Kevin Rhodes, Comment, *The Federal Circuit's Patent Nonobviousness Standards: Theoretical Perspectives on Recent Doctrinal Changes*, 85 NW. U.L. REV. 1051, 1068–76 (1991) ("The Federal Circuit has . . . emphasiz[ed] that secondary considerations, if present, are always relevant under section 103, and must always be given evidentiary weight before reaching a decision on the obvious/nonobvious issue.").

109. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050 (Fed. Cir. 1988) (citing *Graham*, 383 U.S. at 17–18).

110. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1569 (Fed. Cir. 1987).

111. *See Polaris Industries, Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018) ("We have observed that 'the prejudice of hindsight bias' often overlooks that the 'genius of invention is often a combination of known elements which in hindsight seems preordained.'") (quoting *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013)); *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) ("A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant on *ex post* reasoning.").

112. For an experimental demonstration of the risk of hindsight bias in obviousness analysis, see Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration that the Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391 (2006).

113. *See* Abramowicz & Duffy, *supra* note 100, at 1655 ("The secondary considerations as understood by courts today make more sense in light of the

example, the importance of patent incentives ex ante is understandably greater, and the doctrine takes note.[114] The secondary considerations thus serve as a thumb on the scale, making patentability comparatively more difficult for inventions that would have been readily made, even without a patent system and its accompanying costs. Utilitarian law-and-economics are at full force, in other words, while the Supreme Court utterly rejects the idea of any kind of "natural right"[115] in one's inventions.

C. Subject-Matter Eligibility

Section 101 of the patent statute governs what *types* of inventions are patentable—on its face, seemingly anything: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent . . . ."[116] Indeed, as the Supreme Court has recognized, "Congress intended statutory subject matter to 'include anything under the sun that is made by man.'"[117] Over time, however, a series of carveouts and tests have come to cabin this textual breadth and now offer the central doctrine of subject-matter eligibility, often summarized as a rule that "laws of nature, natural phenomena, and abstract ideas"[118] are unpatentable. Collectively, they represent a limit on patent-eligible subject matter informed principally by utilitarian reasoning, with moral considerations again given short shrift.

Consider first the "law of nature" exception: discoveries as to the rules and principles that govern our universe are unpatentable. As the Court has explained, "Einstein could not patent his celebrated law that $E=mc^2$[,] nor could Newton have patented the law of gravity," because "[s]uch discoveries are 'manifestations of . . . nature, free to all men and reserved exclusively to none.'"[119] In *Mayo Collaborative Services*

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inducement theory, and an appreciation of the role of commercialization can further clarify and improve how the courts apply [them].").

114. *Id.* at 1671–72.

115. *See Graham v. John Deere Co.*, 383 U.S. 1, 9–11 (1966).

116. 35 U.S.C. § 101 (2012).

117. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (quoting S. Rep. No. 82-1979 (1952); H.R. Rep. No. 82-1923 (1952), *as reprinted in* 1952 U.S.C.C.A.N. 2394, 2399).

118. *Alice Corp. v. CLS Bank Intern.*, 573 U.S. 218 , 2016 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)); *see also Bilski v. Kappos*, 561 U.S. 593, 601 (2010) ("The Court's precedents provide three specific exceptions to § 101's broad patent-eligibility principles: laws of nature, physical phenomena, and abstract ideas.").

119. *Chakrabarty*, 447 U.S. at 309 (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)).

v. Prometheus Laboratories, Inc.,[120] for example, the Court invalidated a patent covering a method of using thiopurine drugs in treating autoimmune gastrointestinal diseases, such as Crohn's.[121] As the Court held: "Prometheus'[s] patents set forth laws of nature—namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm."[122] Following the Court's standard, the Federal Circuit has recently denied patentability for a method of assessing a patient's risk of future cardiovascular disease by measuring tissue levels of myeloperoxidase,[123] and a method for diagnosing fetal characteristics and abnormalities using cell-free fetal DNA found in the mother's blood.[124]

Related, though somewhat broader, is the "abstract ideas" exception. In brief: "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."[125] In practice, it is formulae and algorithms—computer-implemented or otherwise—that tend to trigger this exception. For example, the Court has rejected patentability for the following: an algorithm to convert binary-coded decimal numbers into pure binary code;[126] a mathematically defined process for hedging against the risk of price fluctuations in commodities markets;[127] and a method for using a third-party intermediary and shadow ledger entries to ensure both sides of a financial transaction will be able to immediately and simultaneously execute their mutual obligations.[128] The Federal Circuit has followed suit, invalidating many software patents in particular as unpatentably abstract.[129]

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120. 566 U.S. 66 (2012).

121. *Id.* at 72.

122. *Id.* at 77.

123. *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 859 F.3d 1352, 1361 (Fed. Cir. 2017).

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

125. *Bilski v. Kappos*, 561 U.S. 593, 609–10 (2010) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).

126. *Gottschalk*, 409 U.S. at 64–68.

127. *Bilski*, 561 U.S. at 599, 611.

128. *Alice Corp. Pty. v. CLS Bank Int'l*, 573 U.S. 208, 210–12 (2014).

129. *See, e.g.*, *OIP Techs. v. Amazon.com*, 788 F.3d 1359 (Fed. Cir. 2015); *see generally* Jasper L. Tran, *Two Years After* Alice v. CLS Bank, 98 J. PAT. & TRADEMARK OFF. SOC'Y 354, 363–65 (2016) (finding that, in the two years after *Alice Corp.*, "the Federal Circuit . . . only issued two opinions that upheld the patent-eligibility of a software invention"); Lucas S. Osborn, *Intellectual Property Channeling for Digital Works*, 39 CARDOZO L. REV. 1303, 1330 (2018) ("After *Alice*, the landscape for software-related patents is at best uncertain and at worst bleak.").

Finally, the "natural phenomena" exception precludes patentability for things that already exist—somewhere, out there—in nature. Put simply, "a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter."[130] In *Funk Bros. Seed Co. v. Kalo Inoculant Co.*,[131] for example, the Supreme Court rejected patentability for a plant inoculant, composed of certain "mutually non-inhibitive strains of . . . species of bacteria of the genus Rhizobium."[132] More recently, the Court invalidated Myriad Genetics's patent claims covering the isolated "BRCA" genes—powerful predictors of breast and ovarian cancer risk—finding that "a naturally occurring DNA segment is a product of nature and not patent eligible."[133] Under this exception, the Federal Circuit has likewise rejected attempts to claim inventions ranging from lab-cloned sheep[134] to a blend of fatty acids that occurs naturally in olives.[135]

This bundle of exceptions to subject-matter eligibility is a relatively poor fit for the moral perspectives outlined above. Begin with labor theory, observing that the doctrine is decidedly *not* an inquiry into whether the inventor had to put work into their discovery. Whether a "product of nature," for example, was discovered by accident on one's own lawn or after a dangerous and costly expedition into the remote wilds is irrelevant to the analysis; it's simply unpatentable either way. Likewise, it may be safely assumed that the inventors who discovered the relationship between certain genes and cancer, between binary and decimal code, or between a medicine's dosage and toxicity invested considerable time, effort, and money into those endeavors, with no effect on legal outcome. Taking the converse of this principle, moreover, demonstrates the misfit of personhood theory. That is, someone who *serendipitously creates* something new—say, an artificial sweetener[136] or Silly Putty[137]—can receive a patent,[138] regardless of the

130. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

131. 333 U.S. 127 (1948).

132. *Id.* at 128 n.1.

133. *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 580 (2013). In contrast, the Court upheld the patentability of Myriad's claims covering synthetic, exon-only "complementary DNA" molecules. *Id.* at 595 ("[T]he lab technician unquestionably creates something new when cDNA is made.").

134. *In re Roslin Inst. (Edinburgh)*, 750 F.3d 1333, 1339 (Fed. Cir. 2014) ("There is nothing in the claims . . . that suggests that the clones are distinct in any relevant way from the donor animals of which they are copies.").

135. *In re Bhagat*, 726 F. App'x 772, 779 (Fed. Cir. 2018) ("The Board concluded that the claims are directed to the omega-6 and omega-3 fatty acids that occur in nature . . . . We have considered all of the Applicant's arguments, and conclude that substantial evidence supports . . . the rulings of unpatentability.").

136. *See Chemistry Now: Chance Discoveries: Artificial Sweeteners*, NAT'L SCI. FOUND.,

lack of any directed intent or meaningful will with respect to its creation. But the discoverer of a rare, perhaps even singular plant with apparent curative properties will not receive protection against interference as she attempts to—like Michelangelo with his block of marble—realize her vision of drawing a practicable medicine from it. The protection can only come afterward, if ever. Distributive concerns scarcely even merit mentioning; the doctrine is flatly agnostic on the issue. The Court may have rejected subject-matter eligibility for certain cancer-detecting genes, but patentees remain free to seek monopolies on lifesaving pharmaceutical compositions or famine-ending GMO crops.

Instead, the courts' principal concern in policing subject-matter eligibility is classic law and economics: the appropriate balance between incentives to innovate and open competition and access. Start with the Supreme Court's own characterization of the "laws of nature, natural phenomena, and abstract ideas" triumvirate, from the most recent landmark cases. From *Mayo*: "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than would tend to promote it. . . . [T]he underlying functional concern here is a *relative* one: how much future innovation is foreclosed relative to the contribution of the inventor."[139] Likewise, from *Myriad Genetics*:

> As we have recognized before, patent protection strikes a delicate balance between creating 'incentives that lead to creation, invention, and discovery' and 'imped[ing] the flow of information that might permit, indeed spur, invention.' . . . We must apply this well-established standard to determine whether Myriad's patents claim any 'new and useful . . . composition of matter,' § 101, or instead claim naturally occurring phenomena.[140]

Or, finally, *Alice*: "[P]atents that claim the 'building blocks' of human ingenuity . . . 'would risk disproportionately tying up the use of the underlying' ideas, and are therefore ineligible . . . for the monopoly

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https://www.nsf.gov/news/special_reports/chemistrynow/chem_sweeteners.jsp [https://perma.cc/U2B2-7A35].

137. *See* Nat'l Toy Hall of Fame, *Silly Putty*, STRONG: NAT'L MUSEUM PLAY, http://www.toyhalloffame.org/toys/silly-putty [https://perma.cc/M6B5-R267].

138. *See* U.S. Patent No. 319,082 (filed Aug. 7, 1884) (listing patent as "manufacture of saccharine compounds"); U.S. Patent No. 2,541,851 (filed Dec. 23, 1944) (patenting the "process for making puttylike elastic plastic, siloxane derivative composition containing zinc hydroxide").

139. *Mayo Collaborative Servs. v. Prometheus Labs. Inc.*, 566 U.S. 66, 71, 88 (2012).

140. *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 590 (2012) (citation omitted).

granted under our patent laws."[141] That is, in the Court's eyes, the costs of granting individuals monopoly power over these types of inventions would almost never be outweighed by whatever additional innovation patentability would spur on the margins.[142]

Indeed, a substantial body of scholarship supports this heuristic. For one, the basic research that tends to produce broad, fundamental-principle discoveries (as compared to more narrow, applied research) is less responsive to and reliant on external financial incentives in the first place.[143] For another, the inherent breadth of these types of discoveries engenders "unclear boundaries," and hence disproportionately costly litigation rates.[144] Moreover, modeling some of the specific areas heavily affected by the § 101 exceptions in practice—genes,[145] software,[146] and business methods[147]—suggests that the doctrine is, in fact, mapping onto the fields where broad patentability would be

141. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 217 (quoting *Mayo*, 566 U.S. at 1303) (internal citations omitted).

142. Mark A. Lemley et al., *Life After* Bilski 63 STAN. L. REV. 1315, 1328–29 (2011) (arguing that the § 101 exclusions collectively reflect a "concern about overbreadth" relative to the societal benefits).

143. *See, e.g.*, LANDES & POSNER, *supra* note 1, at 306–07; Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 904–27 (2009).

144. JAMES BESSEN & MICHAEL MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 150–55 (2008); Gerard N. Magliocca, *Patenting the Curve Ball: Business Methods and Industry Norms*, 2009 BYU L. REV. 875, 891 (2009); Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1819–25 (2007).

145. *See, e.g.*, Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698–99 (1998); Laurie L. Hill, *The Race to Patent the Genome: Free Riders, Hold Ups, and the Future of Medical Breakthroughs*, 11 TEX. INTELL. PROP. L.J. 221, 241–46 (2003).

146. *See, e.g.*, Jason M. Schultz & Brian J. Love, *Brief of* Amici Curiae *Law, Business, and Economics Scholars in Support of Respondents in* Alice Corp. Pty. Ltd. v. CLS Bank International, et al., 4 N.Y.U. J. INTELL. PROP. & ENT. L. 358, 361–74 (2015); James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents*, 16 J. ECON. & MGMT. STRATEGY 157 (2007); Pamela Samuelson, Benson *Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025 (1990).

147. *See, e.g.*, David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMPLE L. REV. 181, *54 (2009) ("There is strong reason to believe that business methods lie on Figure 2 where patenting is never efficient. . . . [T]he level of incentive to invent new and useful business methods is quite high without any patent protection . . . . [I]n the short run . . . the inventing firm receives exclusive benefits of the new method. . . . [which] will be enough to make the invention worthwhile . . . .").

particularly costly, and with comparatively low returns.[148] Finally, adding a functionalist dimension of efficiency, analysts have suggested that courts use § 101 doctrine as a "quick way to screen out weak patents," analogous to the "quick look" doctrine in antitrust law, to save the considerable expense of full discovery and trial where it is not worth the candle.[149]

It is also worth noting that, unlike the United States, other patent systems have codified ethical considerations into their subject-matter eligibility provisions outright. Though not dispositive, the contrast between these foreign statutes and § 101 is striking:

> European patents shall not be granted in respect of:
> (a) Inventions the commercial exploitation of which would be contrary to "ordre public" or morality . . .
> (c) Methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practised on the human or animal body . . . .[150]

Similar language even appears in TRIPS—an international treaty designed to *strengthen* international intellectual property protection overall[151]—specifically allowing member states the option to "exclude [subject matter] from patentability . . . [where] necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment."[152]

The absence, in other words, of moral considerations in subject-matter eligibility doctrine runs from top to bottom. They are conspicuously absent from the statutory text, they do not provide the framework for discussion in judicial opinions, and they often cannot provide justification for the resulting outcomes of case law. It is utilitarianism instead that appears to dominate.

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148. Yuqing Cui, *A Quantitative Approach to Determining Patentable Subject Matter*, 30 HARV. J.L. & TECH. 629 (2017) (modeling all three industries, and finding patentability thereof to be, at best, a break-even proposition).

149. *See, e.g.*, MENELL, LEMLEY & MERGES, *supra* note 1, at 301–02.

150. Convention on the Grant of European Patents, art. 53, Nov. 29, 2000, https://www.epo.org/law-practice/legal-texts/html/epc/2016/e/EPC_conv_20180401_en_20181012.pdf [https://perma.cc/2L63-6U7X].

151. *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Preamble, Apr. 15, 1994, 1869 U.N.T.S. 299 (1994) [hereinafter TRIPS], ("Desiring to reduce distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights . . . "); *see generally* Peter K. Yu, *The Objectives and Principles of the TRIPS Agreement*, 46 HOUS. L. REV. 979, 982–92 (2009) (describing the negotiation process, including the eventual dominance of the stronger-protection coalition).

152. TRIPS, *supra* note 151, art. 27.2.

D. Utility

In addition to subject-matter eligibility, § 101 also sets forth a separate "utility" requirement. The reader will perhaps be unsurprised that the *utility* doctrine, of all things, proves to be utilitarian in nature as well. But even beyond its current form, the evolution of this doctrine provides a prime example of the dominance of utilitarian thought for determining patent validity, and the explicit retreat of morality-based considerations.

Starting with the statute's language, recall that "[w]hoever invents or discovers any new *and useful* process, machine, manufacture, or composition of matter, or any new *and useful* improvement thereof, may obtain a patent . . . ."[153] Today, courts interpret this term as setting forth essentially two prerequisites to patentability. First, the invention must actually be *usable*, in the sense that it must function in reality.[154] This is, in most cases, a mere formality[155]—but it has served to block attempted patents on perpetual motion machines,[156] cold fusion,[157] and snake-oil cures.[158] Second, the invention must *have a use*, in the sense that it has a known and disclosed application.[159] Again, this is a relatively low bar to clear in the vast majority of cases.[160] It

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153. 35 U.S.C. § 101 (2019) (emphases added).

154. *See, e.g.*, *Newman v. Quigg*, 877 F.2d 1575, 1581 (Fed. Cir. 1989) ("The district court, on trial of the merits, held Mr. Newman's invention unpatentable under 35 U.S.C. § 101 because 'Newman's device lacks utility (in that it does not operate to produce what he claims it does).'"); *see generally* Michael Risch, *Reinventing Usefulness*, 2010 BYU L. REV. 1195, 1202 (noting that "a patented invention must actually achieve some intended result," and that "utility requirements exclude . . . inoperable inventions").

155. *See* MENELL, LEMLEY & MERGES, *supra* note 1, at 238 ("As a matter of PTO practice, a specification which contains a disclosure of utility . . . must be taken as sufficient . . . unless there is a reason for one skilled in the art to question the objective truth of the statement of utility or its scope."); Nathan Machin, *Prospective Utility: A New Interpretation of the Utility Requirement of Section 101 of the Patent Act*, 87 CAL. L. REV. 421, 426–27 (1999) ("[P]atent examiners cannot question the . . . utility of an invention that obviously is in line with known scientific principles. This group contains the majority of claimed inventions.").

156. *See, e.g.*, *Newman*, 877 F.2d at 1577.

157. *See, e.g.*, *In re Swartz*, 232 F.3d 862 (Fed. Cir. 2000).

158. *See, e.g.*, *In re Milligan*, No. 97-1093, 1997 WL 168316 (Fed. Cir. Apr. 10, 1997).

159. *See, e.g.*, *Brenner v. Manson*, 383 U.S. 519, 535 (1966) (rejecting patentability for a process for making certain steroid compounds—compounds which, at the time, "ha[d] no known use or [were] useful only in the sense that [they] may be an object of scientific research"); *see generally* Risch, *supra* note 154, at 1203 ("[I]nventions must have some currently available specific and substantial use to satisfy § 101's 'useful' requirement.").

160. *See* MENELL, LEMLEY & MERGES, *supra* note 1, at 240 ("Most applications of the doctrine have been quite limited in the hurdles they place before

operates primarily to prevent out-and-out speculation in patenting; in the Supreme Court's words: "[A] patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion."[161]

The utilitarian valence of these two requirements is certainly clear enough—inventions that have no application or cannot actually function offer nothing to society at large, and so the patent quid pro quo is not fulfilled. But for most of the history of the U.S. patent system, there was a third requirement as well: "moral utility."[162] As early as 1817, then-Judge Story noted in dictum: "[T]he law requires . . . that the invention should not be frivolous or injurious to the well-being, good policy, or sound morals of society. The word 'useful,' therefore, is incorporated into the [Patent Act] in contradistinction to mischievous or immoral."[163] For more than a hundred years after, this requirement regularly served to block, for example, attempted patents on gambling devices and improvements thereof.[164] Likewise, courts would deny patents on "deceptive" inventions—finding that they lack appropriately moral uses—ranging from a method of artificially spotting tobacco leaves[165] to a seamless leg stocking with a sham seam along the back.[166]

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inventors."); Machin, *supra* note 154, at 433 ("[T]he principle that the invention must be designed to address a problem or meet a need. . . . provides almost no barrier to the patenting of inventions."). Even in pharmaceutical cases, for example, successful human clinical trials are not a prerequisite to show patent-worthy efficacy; basic lab trials on mice can be sufficient. *See In re Brana*, 51 F.3d 1560 (Fed. Cir. 1995).

161. *Brenner*, 383 U.S. at 536.

162. *See generally* Robert P. Merges, *Intellectual Property in Higher Life Forms: The Patent System and Controversial Technologies*, 47 MD. L. REV. 1051, 1062–68 (1988) (collecting cases).

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

164. *See, e.g.*, *Nat'l Automatic Device Co. v. Lloyd*, 40 F. 89, 89–90 (N.D. Ill. 1889) (rejecting patentability for a toy horse-racing game, because "the only use to which . . . [the] machines have been so far applied, is to place them in saloons, bar-rooms, and other drinking places, where the frequenters of such places make wagers as to which of the toy horses will stop first"); *Schultze v. Holtz*, 82 F. 448, 448 (C.C.N.D. Cal. 1897) (rejecting patentability for a coin-return mechanism, because "the only use to which the complainant's inventions have been put or applied is for gambling purposes in saloons and barrooms"); *Brewer v. Lichtenstein*, 278 F. 512, 512–13 (7th Cir. 1922) (rejecting patentability for a luck-based "vending device," because "[n]o other utility than as a lottery device . . . is suggested in the patent").

165. *Rickard v. Du Bon*, 103 F. 868, 869 (2d Cir. 1900) ("[T]he only effect, if not the only object, of such treatment, is to spot the tobacco, and counterfeit the leaf spotted by natural causes."). Spotted tobacco leaves were, at the time, considered to be a sign of higher quality cigars. *Id.* ("The notion has long prevailed with a numerous class of smokers that cigars having spotted wrappers are superior to those without them.").

166. *Scott & Williams, Inc. v. Aristo Hosiery Co.*, 7 F.2d 1003, 1004 (2d Cir. 1925) ("At best, the seamless stocking has imitation marks for the purpose of deception, . . . [b]ut such accomplishment does not create a new useful discovery or

In the late twentieth century, however, the force of the moral utility requirement began to decline, with courts expressing serious skepticism as to their ability to meaningfully and properly distinguish between "good" and "bad" inventions.[167] By 1977, the PTO granted a slot machine patent outright, and explained its decision thusly:

> It is perhaps true, for example, that the invention of Colt's revolver was injurious to the morals, and injurious to the health, and injurious to the good order of society. . . . On the other hand, the revolver, by furnishing a ready means of self-defense, may sometimes have promoted morals and health and good order. By what test, therefore, is utility to be determined in such cases? Is it to be done by balancing the good functions with the evil functions? . . . [This] hypothesis cannot stand, because if it could, it would make the validity of the patent to depend on a question of fact to which it would often be impossible to give a reliable answer.[168]

Instead, the PTO suggested, "everything [is] useful within the meaning of the law," as long as it has some hypothetical adaptation or use "to accomplish a good result"—even if "in fact it is oftener used . . . to accomplish a bad one."[169] Within a few decades, the Federal Circuit adopted this line of reasoning, and effectively erased the moral utility requirement entirely; even where an invention's entire purpose is to aid in "dece[iving]" customers, that "is not by itself sufficient to render the invention unpatentable."[170]

The death of moral utility doctrine is perhaps the most straightforward example of the retreat of deontological moral considerations in favor of consequentialist utilitarianism. For the sake of innovation overall—as well as reducing the costs and errors of

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invention . . . ."). Seamless (or "circular knit") stockings were generally considered to be of inferior quality at the time. *Id.* ("He says the purpose of his invention is to provide in such hosiery an imitation . . . , so that circular knit stockings . . . will not be unfairly associated in the minds of purchasers with a crude and inferior class of goods . . . .").

167. Merges, *Higher Life Forms*, *supra* note 162, at 1063 ("[C]ourts had become more wary of denying patents on the basis of an indeterminate moral standard.").

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

169. *Id.* at 275.

170. *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1368 (Fed. Cir. 1999) (regarding a "post-mix beverage dispenser"—one that mixes beverages from concentrate at the time of dispensing—designed to look like it provides not-from-concentrate beverages, by means of a clear top bowl filled with ersatz fresh juice that the machine appears to be dispensing). *See generally* Risch, *supra* note 154, at 1205 ("[M]oral utility is essentially ignored today . . . ."); Machin, *supra* note 154, at 436 (observing same).

adjudication—inventions used to primarily work harm are nevertheless patentable. In particular, one would strongly suspect that the gambling devices, deceptive consumer machines, and firearms made possible by the elimination of this doctrine are likely to disproportionately impact those least well-off in society to the enrichment of a small few. To wit, the individual who will ultimately be affected by these inventions is now left out of the calculus entirely, making it challenging—if not impossible—to incorporate values such as justice or autonomy in a meaningful way. If Locke's proverbial apples are gathered by parting them from gambling addicts, for example, dessert would hardly seem to apply. And a deceptive consumer device cannot square with any reasonable conception of autonomy vis-à-vis informed decision making. Instead, it is utilitarianism that offers the strongest and simplest explanation for the elimination of a once-robust strand of utility doctrine.

E. Written Description and Enablement

Beyond the claims themselves, a patent must also "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art . . . . to make and use the same . . . ."[171] This statutory language has since been interpreted as two separate, but closely related requirements: written description and enablement.[172] When a patent's specification fails to satisfy these requirements, the claims covering that invention are invalid, even if the invention is otherwise subject-matter eligible, useful, novel, and so on.[173]

Written description is, in theory, focused primarily on ensuring that the "inventor actually invented the invention claimed," in a possessive sense.[174] That is, by forcing the inventor to describe their invention in specific and concrete terms, subject matter that the

171. 35 U.S.C. § 112 (2012).

172. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1344–45 (Fed. Cir. 2010) (en banc) ("[W]e . . . hold that § 112, first paragraph, contains two separate description requirements . . . . [A] description requirement separate from an enablement requirement . . . .").

173. *See, e.g.*, *AbbVie Deutschland GmbH & Co., KG v. Janssen Biotech, Inc.*, 759 F.3d 1285 (Fed. Cir. 2014) (upholding the district court's determination of invalidity on § 112 grounds alone).

174. *Ariad*, 598 F.3d at 1351; *see also Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1158 (Fed. Cir. 1998) ("To meet this requirement, the disclosure . . . must reasonably convey to one of skill in the art that the inventor possessed the later-claimed subject matter at the time [of application]."); *see generally* Dennis Crouch, *An Empirical Study of the Role of the Written Description Requirement in Patent Examination*, 104 NW. L. REV. 382, 382 (2010) (stating that written description doctrine "focus[es] on proof that the patentee . . . has possession of the invention").

inventor did not actually understand or have under control at the time of patenting will naturally wind up being excluded. Enablement, on the other hand, is externally focused; the specification must include enough information and detail so that one reasonably "skilled in the art [can] make and use the invention without undue experimentation."[175] Enablement is, in other words, about replicability[176] and the "dissemination of information"[177] to the public. The inventor's relationship to the subject matter is functionally irrelevant.

In that sense, enablement is transactionally utilitarian to its core; it restricts the coverage of the patent grant, and hence the temporary costs of monopoly, to what is gained by the public in offsetting the exchange in terms of knowledge and research. Put differently, the invention itself (in the sense of whatever it is that the inventor actually discovered, implemented, and claimed) is subordinate to the interests of growth via follow-on innovation—the latter unilaterally restricts the former. Locke's mixing of labor or Kant's infusion of will are, in other words, not a sufficient basis to grant ownership of the invention. Rather, ownership must be purchased, by first making a deposit into the economy as a whole. To wit, the specification requirements are almost universally referred to as a "quid pro quo" arrangement by judges and scholars alike.[178]

So what of written description? The idea of a robust possession requirement would appear to resonate well with Lockean or Kantian theories of ownership, the focus being entirely on the relationship of the inventor to the subject matter at issue. That is, the quid pro quo is set aside temporarily, in favor of an attempt to assign rights only to the

175. *In re Wands*, 858 F.2d 731, 735–37 (Fed. Cir. 1988).

176. *Cf.* Deposit of Biological Materials for Patent Purposes, 54 Fed. Reg. 34,864 (Aug. 22, 1989) ("Where the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible or repeatable manner, access to the biological material is necessary for the satisfaction of . . . 35 U.S.C. § 112.").

177. Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 133 & n.51 (2006).

178. *See, e.g.*, *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Intern., Inc.*, 534 U.S. 124, 142 (2001) ("The disclosure required by the Patent Act is 'the *quid pro quo* of the right to exclude.'") (quoting *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484 (1974)); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1345 (Fed. Cir. 2010) (en banc) ("[A] separate requirement to describe one's invention is basic to patent law. . . . It is part of the *quid pro quo* of a patent; one describes an invention, and, if the law's other requirements are met, one obtains a patent."); Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1186 (2002) ("As the quid pro quo for her period of exclusive rights over an invention, the inventor must fully disclose the invention to the public."); Jacob Adam Schroeder, *Written Description: Protecting the Quid Pro Quo Since 1793*, 21 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 63 (2010).

particular innovations on which the inventor labored or stamped her will.

But in practice, the written description requirement has essentially become a nullity, subsumed by other validity requirements. Professor Dennis Crouch, for example, offers an empirical analysis of nearly three thousand PTO appeals—and found that "none of the outcomes . . . would have been impacted by a legal change that entirely eliminated the written description requirement . . . ."[179] In particular, it appears that enablement is doing the heavy lifting, a suggestion supported by empirical studies from other scholars,[180] practitioner media,[181] and comments from Federal Circuit judges alike.[182] The logic is fairly straightforward: if one can explain an innovation so well that others can replicate and copy it, by what standard would that explanation possibly fail to demonstrate mastery on the part of the inventor? Reversed, if one doesn't understand the subject matter themselves, it seems unlikely that one could hope to adequately *teach* it. The specification requirements of enablement and written description thus offer another example of utilitarianism's greater pull over the rules governing validity. Though two separate requirements in name, the objective and transactional one has essentially eaten the subjective and desert-focused one.

F. Inventorship

Any patent application must include "the name of the inventor [or joint inventors] for any invention claimed in the application,"[183] and those same names are printed at the top of the final patent document itself.[184] They are the individuals who "conceived" the invention, who

179. Crouch, *supra* note 174, at 383.

180. *See, e.g.*, Christopher M. Holman, *Is* Lilly *Written Description a Paper Tiger?: A Comprehensive Assessment of the Impact of* Eli Lilly *and Its Progeny in the Courts and PTO*, 17 ALB. L.J. SCI. & TECH. 1, 71 (2007) (finding that, in the small number of cases where written description is used to reject claims in a patent application, they are also either "explicitly held invalid for violation of the enablement requirement" or "could have easily been found" to do so).

181. *See, e.g.*, Christopher M. Holman, *Enablement Invoked as a "Super-Written Description Requirement" to Overturn $2.5 Billion Jury Verdict*, 37 BIOTECH. L. REP. 63, 63 (2018) (observing that the two doctrines are "essentially redundant").

182. *See, e.g.*, Crouch, *supra* note 174, at 383 (quoting then-Chief Judge Michel) ("[It is] exceedingly rare that the patent office hangs its case on written description."); *see* Oral Argument at 23:00–29:30, *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336 (Fed. Cir. 2010) (No. 2008-1248) (argued Dec. 7, 2009), http://oralarguments.cafc.uscourts.gov.

183. 35 U.S.C. § 115 (2012).

184. *See, e.g.*, Patent No. D724,031 (2012) (filed Jul. 13, 2012) (naming "Elon Reeve Musk" and four others as the inventors of a particular "Vehicle Charge Inlet").

"form[ed] in the[ir] mind[s] . . . a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice."[185] Accordingly, the named inventors must be actual "natural persons," and "cannot be corporations or sovereigns."[186] Failure to name the correct inventors (whether by omission or erroneous addition) can result in invalidation of the patent, even if all other requirements for patentability are met.[187] This is, to be clear, entirely separate and distinct from the *assignee* of the patent—the patent's owner.[188] The inventor may have signed over all ownership rights in the invention (for example, as terms of an employment contract) long before any patent is filed or issued, but they still must be named.[189]

At first glance then, the inventorship requirement resonates remarkably well with the *non*-economic moral frameworks examined supra, and with personhood theories in particular. The requirement suggests a fundamental, dignitary relationship between inventor and invention—a relationship that is unique to human persons, and wholly independent of "ownership" in the remunerative, royalty-entitled sense. It is telling, then, that the inventorship requirement has been consistently reduced in practical severity over time, and is currently at its weakest force in history. The doctrinal arc of inventorship, like moral utility, thus provides another example in the law governing patent validity where previously strong moral considerations have since been marginalized and eliminated.

Prior to 1952, the stakes of the inventorship requirement were extraordinarily high; there was no way to correct inventorship errors post-issuance,[190] and only limited options during the application process

185. *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994).

186. *Univ. of Utah v. Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften*, 734 F.3d 1315, 1323 (Fed. Cir. 2013).

187. *See* 35 U.S.C. § 256(b) (2011) ("The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred *if it can be corrected as provided in this section*.") (emphasis added); DONALD S. CHISUM, CHISUM ON PATENTS § 2.01 (2019) ("This . . . requirement bars issuance of a patent for a conception derived from any source or person other than the person or persons named as in the inventorship entity."); *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1349–50 (Fed. Cir. 1998) ("[F]ailure to name [the inventors] renders a patent invalid.").

188. *See* 35 U.S.C. § 261, 262 (2012).

189. *See, e.g.*, *Shukh v. Seagate Tech., LLC*, 803 F.3d 659 (Fed. Cir. 2015).

190. *See In re Hamilton*, 37 F.2d 758 (C.C.P.A. 1930) (finding the reissue statute to be inapplicable to inventorship errors); *MCV, Inc. v. King-Seeley Thermos Co.*, 870 F.2d 1568, 1570 (Fed. Cir. 1989) ("Before the enactment of section 256, patentees and their assignees committed inventorship errors at their peril; misjoinder or nonjoinder of an inventor rendered the patent invalid.").

itself.[191] If the applicant got the names wrong the first time, in other words, their patent could be dead on arrival. In an effort to reduce these dire consequences,[192] the Patent Act of 1952 created procedures for correction of inventorship, both during the application process[193] and post-issuance.[194] But, to be correctable, any such mistake needed to have been made in good faith[195] as well as incomplete in scope (i.e., at least one named inventor needed to be correct).[196] In a 1982 amendment, Congress relaxed the latter requirement, but continued to require good faith.[197] With the 2011 America Invents Act, the good faith requirement was eliminated as well.[198]

So what remains? Essentially nothing; a processing fee of (at most) $140 is all that stands between most applicants or patentees and curing their inventorship defects.[199] There is still a general duty of candor to the PTO and good faith during the application process, which could include false statements as to inventorship,[200] but violating that duty

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191. *See generally supra* note 187, at § 2.04[1][a] (observing that, prior to 1952, inventors could be *removed* during the application process, but not *added* without filing a new application—and hence "los[ing] the filing date of the original application").

192. S. REP. NO. 82-1979, at 6 (1952) ("If they make a mistake in determining who are the true inventors, they do so at their peril. This provision permits a bona fide mistake in joining a person as an inventor or in failing to join a person as an inventor to be corrected.").

193. 35 U.S.C. § 116 (1952).

194. 35 U.S.C. § 256 (1952).

195. *See* 35 U.S.C. § 116 (1952) (limiting correction to circumstances of "error . . . without any deceptive intention"); 35 U.S.C. § 256 (1952) (using the same language).

196. *See, e.g.*, *Rival Mfg. Co. v. Dazey Prod. Co.*, 358 F. Supp 91, 97–101, 177 U.S.P.Q. 432 (W.D. Mo. 1973); U.S.P.T.O., MANUAL OF PATENT EXAMINING PROCEDURE § 201.03 (3d ed. rev. July 1976) ("An application which was filed by A and amended to add B to form joint applicants AB, cannot be again amended to make B the sole applicant.").

197. Act of Aug. 27, 1982, P.L. 97-247 § 6, 96. Stat 317 (codified as amended at 35 U.S.C. § 256 (1982)).

198. Leahy-Smith America Invents Act § 20(a), (f), Pub. L. No. 112-29, 125 Stat. 284 (2011) (deleting the phrase "without any deceptive intention" from 35 U.S.C. §§ 116, 256).

199. 37 C.F.R. §§ 1.17(i), 1.48(a)(2) (2018); *see generally* U.S.P.T.O., MANUAL OF PATENT EXAMINING PROCEDURE § 1402 (9th ed. rev. Jan. 2018) ("A certificate of correction will be issued if all parties are in agreement and the inventorship issue is not contested."); U.S.P.T.O., MANUAL OF PATENT EXAMINING PROCEDURE § 2157 (9th ed. rev. Jan. 2018) ("In the *rare situation* where it [is] clear that the application does not name the correct inventorship and the applicant has not filed a request to correct . . . ."") (emphasis added); Mark A. Lemley, *Rethinking Assignor Estoppel*, 54 HOUS. L. REV. 513, 530 (2016) (arguing that "[i]nvalidity for incorrect inventorship . . . was abolished outright" by the America Invents Act).

200. *See, e.g.*, CHISM *supra* note 187, at § 2.04[d].

renders the patent *unenforceable*, not invalid.[201] That is, such violations now operate as a defense on the infringement side—not as a meaningful consideration on the validity side.[202]

The moral dimension of the inventor's personhood, as independent from the patentee's economic interests as owner, has thus been sharply minimized with respect to validity. This gives clear primacy to the utilitarian theories of patents as property: if, say, Microsoft is the entity actually funding and directing some kind of innovation through its internal research and development divisions, then utilitarians' primary concern should be ensuring *Microsoft* eventually receives appropriate ownership of the resulting inventions, not whether any particular employee receives purely nominal credit. Assuming the rest of patent law is functioning correctly, the appropriate financial incentives will thereby be in place for the actual decisionmakers to promote innovation on the margins. To the extent that nominal credit is seen as valuable by the employees themselves (by generating status and recognition among their colleagues, for example), contracting freely for those rights, independent of patent law, still maintains efficiency. Imposing an unavoidable naming requirement, on the other hand, does not—making the requirement's weakening and marginalization over time particularly telling.

In summary, between novelty, nonobviousness, subject-matter eligibility, utility, written description, enablement, and inventorship, there appears to be a strong gravitational pull towards utilitarian reasoning and justification with respect to patent validity doctrine. Freestanding moral frameworks, by contrast, have generally been curtailed over time—or, in multiple cases, flatly and emphatically rejected outright.

III. PATENT INFRINGEMENT – THE RESILIENCE OF MORALITY

The movement towards utilitarian theory detailed in Part II may not seem particularly surprising, on its own. Economic analyses of law have been on the rise across disciplines, and the utilitarian framework sees particular justification in the context of patent law, given its textual and historical roots. The surprise comes as one turns their focus from the rules governing patent validity to the rules governing patent infringement. Throughout this half of the field, whether addressing relief (damages or injunctive), claim scope (vis-à-vis the doctrine of equivalents), or defenses (inequitable conduct and prior use), there is a persistent and recurring thread of moral reasoning and justification.

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201. *See, e.g.*, *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1285 (Fed. Cir. 2011).

202. *See infra* Section III.D.

And, across multiple doctrines, it is utilitarianism instead that has been marginalized or undone.

A. Damage Enhancement and Attorney's Fees

Since the very beginning of U.S. patent law, the award of damages has been informed by non-economic moral considerations. The Patent Act of 1793 set damages at treble the actual injury in lost royalties—at minimum.[203] In the 1836 revision of the patent statute, Congress added language to make these enhanced damages merely discretionary: "[I]t shall be in the power of the court to render judgment for any sum above the amount found by [the] verdict . . . not exceeding three times the amount thereof, according to the circumstances of the case."[204] Its reason for doing so, the Court held, was to grant courts the ability to distinguish between more and less morally culpable defendants—to avoid the "injustice" of treating a "defendant who acted in ignorance or good faith" as severely as the "wanton and malicious pirate[s]" of inventions.[205]

Later revisions of the patent statute kept this discretionary language.[206] In parallel, the courts continued to view the enhancement of damages as a "vindictive or punitive" measure,[207] justified by considerations orthogonal to economic harm. In rejecting one such claim for enhanced damages, for example, the Court noted: "There is no pretense of any wanton and willful [conduct] by the plaintiff; nothing that suggests punitive damages, or that shows wherein the defendant was damnified, other than by the loss of the profits which the plaintiff receive[d]."[208] The most recent statutory language (coming originally from the 1952 Patent Act) continues the trend of broad discretion[209] and, after its enactment, the Court has continued to

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203. Patent Act of 1793, § 5, 1 Stat. 318-323 ("[E]very person so offending, shall forfeit and pay to the patentee, a sum, that shall be at least equal to three times the price, for which the patentee has usually sold or licensed . . . the use of said invention . . . .").

204. Patent Act of 1836, § 14, 5 Stat. 123.

205. *Seymour v. McCormick*, 57 U.S. (16 How.) 480, 488 (1854).

206. *See, e.g.*, Patent Act of 1870, ch. 230 § 59, 16 Stat. 207 (1870) (allowing the district court to award up to treble damages "according to the circumstances of the case") (current version at 35 U.S.C. § 284 (2012)).

207. *Tilghman v. Proctor*, 125 U.S. 136, 144 (1888); *see also Power Specialty Co. v. Conn. Light & Power Co.*, 80 F.2d 874, 878 (2d Cir. 1936) (describing the infringement as "wanton, deliberate, and willful"); *Brown Bag Filling Mach. Co. v. Drohen*, 175 F. 576, 577 (2d Cir. 1910) (describing the infringement as "a bald case of piracy").

208. *Cincinnati Siemens-Lungren Gas Illuminating Co. v. W. Siemens-Lungren Co.*, 152 U.S. 200, 204 (1894).

209. 35 U.S.C. § 284 (2012).

describe such damages as "punitive," and limited to "case[s] of willful or bad-faith infringement."[210]

To say the least, then, the courts' essential *description* of willfulness damages is moralizing rather than economic in nature. But, without more, a plausible argument could be made that the true effect of or justification for these supra-compensatory damages is nevertheless based on economic calculi used broadly in tort law. For example, since the probability of being caught infringing is not 100 percent, the amount of damages assessed against those who are caught is perhaps enhanced to generate the appropriate balance of incentives vis-à-vis voluntary compliance.[211] Alternatively, enhanced damages may reflect an understanding that the ordinary damages framework somehow fails to fully account for the actual loss suffered in a given case—such that the plaintiff would not actually be made whole otherwise.[212]

The response is twofold. First, courts have no problem making economic justifications explicit elsewhere—in particular, as just explored, in adjudicating the validity of patents. If enhanced damages are truly and foremost grounded in utilitarian reasoning, it thus seems particularly unlikely that judges would go out of their way to hide the ball with moralizing language. And recall that the statutory language itself imposes no such moral limitation; the court "may increase the damages up to three times the amount found or assessed," full stop.[213] Put differently, it is not as though the courts are externally bound to pay lip service to moral considerations.

Second, the actual standard for proving willfulness clearly sets utilitarianism aside. In practice, securing enhanced damages requires that the plaintiff show the defendant had actual, subjective knowledge of the patent at issue.[214] For a time, the Federal Circuit required *objective* recklessness,[215] but that test was abrogated by the Supreme

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210. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 508 (1964); *see also Dowling v. United States*, 473 U.S. 207, 227 (1985); *Florida Prepaid Postsecondary Ed. Expense Bd. v. Coll. Sav. Bank*, 527 U.S. 627, 648 n.11 (1999).

211. *See, e.g.*, A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 869, 887–96 (1998).

212. *See, e.g.*, Dorsey D. Ellis, Jr., *Fairness and Efficiency in the Law of Punitive Damages*, 56 S. CAL. L. REV. 1, 26–31 (1982).

213. 35 U.S.C. § 284 (2012).

214. *See, e.g.*, *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1341 (Fed. Cir. 2016) ("Knowledge of the patent alleged to be willfully infringed continues to be a prerequisite to enhanced damages."); *see also* Dmitry Karshtedt, *Enhancing Patent Damages*, 51 U.C. DAVIS L. REV. 1427, 1438 (2018) ("Specifically, the Federal Circuit has adhered to its . . . rule that a victorious patent plaintiff cannot receive damages beyond the compensatory baseline unless it can prove, at a minimum, that the defendant had actual knowledge of the patent-in-suit.").

215. *See In re Seagate Tech, LLC*, 479 F.3d 1360, 1371 (Fed. Cir. 2007) ("[A] patentee must show by clear and convincing evidence that the infringer acted

Court,[216] precisely for failing to bear on the correct question of moral culpability:

> Such a threshold requirement excludes from discretionary punishment many of the most culpable offenders, such as the 'wanton and malicious pirate' who intentionally infringes another's patent—with no doubts about its validity or any notion of a defense—for no purpose other than to steal the patentee's business. . . . In the context of such deliberate wrongdoing . . . it is not clear why an independent showing of objective recklessness . . . should be a prerequisite.[217]

The lower courts thereafter returned to exclusively considering subjective intent.[218]

As other scholars have noted, this creates the perverse incentive for businesses to simply avoid engaging in precautionary patent searches as they develop products[219] and dampens voluntary licensing compliance with patentees.[220] Likewise, it undercuts the utilitarian *raison d'être* for patent disclosures in the first place[221] by discouraging researchers from learning and building upon them in their work, thereby slowing down scientific and technological progress.[222] The

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despite an objectively high likelihood that its actions constituted infringement of a valid patent.").

216. *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1933 (2016) ("The subjective willfulness of a patent infringer, intentional or knowing, may warrant enhanced damages, without regard to whether his infringement was objectively reckless.").

217. *Id.* at 1932.

218. *See, e.g.*, *Valinge Innovation AB v. Halstead New England Corp.*, No. 16-1082-LPS-CJB, 2018 WL 2411218 at *9 (D. Del. May 29, 2018); *Puma SE v. Forever 21, Inc.*, 2017 WL 47771004, at *3 (C.D. Cal. June 28, 2017); *Scripps Research Inst. v. Illumina, Inc.*, No. CV17-2523, 2016 WL 6834024, at *7 (S.D. Cal. Nov. 21, 2016); *Malibu Boats, LLC v. MasterCraft Boat Co.*, No. 3:16-CV-82-TAV-HBG, 2016 WL 8286158, at *3 (E.D. Tenn. Oct. 28, 2016); *see also* Karshtedt, *supra* note 214, at 1466–67.

219. *See* Colleen V. Chien, *Opening the Patent System: Diffusionary Levers in Patent Law*, 89 S. CAL. L. REV. 793, 833–34 (2016); Jason A. Rantanen, *An Objective View of Fault in Patent Infringement*, 60 AM. U.L. REV. 1575, 1611–12 (2011); Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 588 (2009).

220. *See* Colleen V. Chien, *Holding Up and Holding Out*, 21 MICH. TELECOMM. & TECH. L. REV. 1, 23–24 (2014) ("Companies are often counseled not to respond to or accept unsolicited offers to license or buy patents, knowing that engaging with the patentholder can often result in legal or settlement costs. Since only [one to two percent] of all enforceable patents are actually litigated, it may be better for a potential infringer to take his chances.").

221. *See supra* Section II.E.

222. *See* Karshtedt, *supra* note 214, at 1471–72 ("[D]uring my time as a scientist working in Silicon Valley, a supervisor once criticized me for finding, through

focus on subjective knowledge is, moreover, a marked departure from the general embrace of objective standards—and explicit, concurrent economics reasoning—that is common across other torts ranging from products liability to copyright infringement.[223] In brief: "Patent law today deviates from modern tort law by requiring actual, subjective knowledge of the plaintiff's patent and, in so doing, it in effect clings to the old interpersonal-animus and moral-opprobrium models of punitive damages."[224] Utilitarianism thus takes a backseat while infringement doctrine attempts to bring pirates to justice.

B. Injunctive Relief

Turning from damages to equity, the nature of injunctive relief in patent infringement suits likewise suggests the relative continued strength of moral considerations. Under Federal Circuit case law before 2006, a successful patentee-plaintiff would be entitled to an injunction against the defendant to prevent future infringement—in addition to damages to remedy past infringement—by default.[225] This use of a property rule over a liability rule is efficient in certain circumstances: where transaction costs between the patentee and infringer are low,[226]

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a Google search, a patent that was arguably relevant to my project. . . . And other legal scholarship shows that my experience with patent searching was far from exceptional."); FED. TRADE COMMISSION, *Executive Summary*, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 16–17 (2003), https://www.ftc.gov/sites/default/files/documents/reports/promote-innovation-proper-balance-competition-and-patent-law-and-policy/innovationrpt.pdf [https://perma.cc/7JLY-J9HT] ("Some Hearings participants explained that they do not read their competitors' patents out of concern for such potential treble damage liability . . . [which can] encourage wasteful duplication of effort [and] delay follow-on innovation that could derive from patent disclosures . . . ."); Lisa Larrimore Ouellette, Halo v. Pulse *and the Increased Risks of Reading Patents*, STAN. L. SCH.: BLOGS (June 16, 2016), https://law.stanford.edu/2016/06/16/halo-v-pulse-and-the-increased-risks-of-reading-patents (flagging "the potential harm from firms deciding that the risks of enhanced liability from reading patents outweigh the teaching benefit those patents could otherwise provide").

223. Karshtedt, *supra* note 214, at 1482–508.

224. *Id.* at 1442–43.

225. *See, e.g.*, *Fuji Photo Film Co.. v. Jazz Photo Corp.*, 394 F.3d 1368, 1380 (Fed. Cir. 2005) ("Generally 'an injunction will issue when infringement has been adjudged, absent a sound reason for denying it.'") (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1247 (Fed. Cir. 1989)); *KSM Fastening Sys., Inc. v. H.A. Jones Co., Inc.*, 776 F.2d 1522, 1524 (Fed. Cir. 1985) ("[I]njunctive relief against an infringer is the norm."); *see generally* Carl Shapiro, *Property Rules vs. Liability Rules for Patent Infringement* at 2 (Berkeley, Working Paper Jan. 10, 2017), https://faculty.haas.berkeley.edu/shapiro/propvsliab.pdf [https://perma.cc/9HRC-P7BN].

226. *See* Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655, 2664–65 (1994).

or where calculating a prospective royalty rate would be especially difficult.[227] But utilitarianism generally tends to favor liability rules—particularly where the scope of a patent is unclear[228] or where there are multiple infringers and patentees involved.[229] In particular, liability rules are urgently needed (from a law-and-economics perspective) where patentees are able to engage in "holdup": if "the defendant has already invested heavily to design, manufacture, market, and sell" the product at issue, the patentee can use an injunction as leverage to demand exorbitant royalties going forward.[230] In this way, over-availability of injunctive relief "can deter innovation by increasing costs and uncertainty for manufacturers," and "raise prices to consumers by depriving them of the benefit of competition among technologies."[231]

In 2006, the Supreme Court pushed back against the Federal Circuit's rigid presumption of injunctive relief, holding in *eBay Inc. v. MercExchange*[232] that "the traditional four-factor test" applies instead.[233] That is, a plaintiff must demonstrate:

> (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in

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227. *See* THOMAS F. COTTER, COMPARATIVE PATENT REMEDIES: A LEGAL AND ECONOMIC ANALYSIS 54 (2013) ("[T]he job of putting a value on patent rights is inherently difficult, particularly in industries in which the technology itself is rapidly evolving."); John M. Golden, "Patent Trolls" and Patent Remedies, 85 TEX. L. REV. 2111, 2152 (2007) ("The difficulty of assessing [damages] has in fact been one of the principal rationales for granting permanent injunctions.").

228. *See generally* Greg Reilly, *Completing the Picture of Uncertain Patent Scope*, 91 WASH. U. L. REV. 1353, 1353 (2014) ("Uncertain patent scope is perhaps the most significant problem facing the patent system.").

229. *See* Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783, 793 (2007) ("[A]s an example of transaction costs, . . . if a buyer must aggregate rights from a number of different parties in order to achieve a useful end result, it will have to deal with a number of sellers.").

230. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007); *see also* Mark A. Lemley, *Contracting Around Liability Rules*, 100 CALIF. L. REV. 463, 468 (2012) ("The biggest risk of applying property rules in IP cases is holdup."); COTTER, *supra* note 227, at 59 ("[P]atent[ed] holdup involves the strategic use of a patent . . . to extract ex post rents that are disproportionate to the ex ante value of the invention in comparison with the next-best available alternative.").

231. FED. TRADE COMMISSION, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 26 (2011).

232. 547 U.S. 388 (2006).

233. *Id.* at 393.

> equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.[234]

Justice Kennedy, writing in concurrence, emphasized the fourth factor in particular—and highlighted the danger of holdup inefficiencies explicitly.[235] The Federal Circuit and district courts have since adopted the four-factor language in their opinions,[236] with *eBay* quickly becoming one of the most widely cited Supreme Court patent decisions in recent history.[237]

At first glance, this doctrinal arc would seem to describe a triumph of utilitarianism over noneconomic moral considerations. The Federal Circuit's old rule presupposed the patent owner's entitlement to an absolute veto as a matter of moral desert, not a balancing of harms seen as economically reciprocal. There was not, in other words, the sort of dispassionate analysis imagined by Calabresi and Melamed that would equally consider granting a "right to pollute"—here, a "right to infringe"—if the utility calculator so indicated.[238] Speaking in the context of traditional property, Professors Thomas Merrill and Henry Smith make a similar case; rather than "tailor[ing] liability costs to the amount of harm inflicted in a particular case," property rules "deter completely"—"which is just what we would expect of rights recognized by traditional morality."[239] Hence, by moving toward the use of liability rules in infringement cases, the argument might go, patent law is stripping some of its moral vestiges.

But that's not what has happened since *eBay*. In practice, patent owners are still able to obtain injunctive relief as a rule. Empirical analyses have shown that district courts continue to grant injunctions to the vast majority of patentee-plaintiffs,[240] and that the Federal Circuit is

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234. *Id.* at 391.

235. *Id.* at 396–97 (Kennedy, J., concurring).

236. *See, e.g.*, *Douglas Dynamics, LLC v. Buyers Prods. Co.*, 717 F.3d 1336, 1344 (Fed. Cir. 2013); *see also* Citing References for *eBay Inc. v. MercExchange, LLC*, WESTLAWNEXT (yielding more than 3000 cites by district courts).

237. Dennis Crouch, *Most Cited Supreme Court Patent Decisions (2005–2015)*, PATENTLY-O (Mar. 11, 2015), http://patentlyo.com/patent/2015/03/supreme-court-cases.html [https://perma.cc/DF4T-LE4A] (placing *eBay* second, out of twenty-three cases).

238. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1118–19 (1972).

239. Thomas W. Merrill & Henry E. Smith, *The Morality of Property*, 48 WM. & MARY L. REV. 1849, 1890 (2007).

240. *See, e.g.*, Christopher B. Seaman, *Permanent Injunctions in Patent Litigation after* eBay*: An Empirical Study*, 101 IOWA L. REV. 1949, 1982–83 (2016) (finding an injunction grant rate of 72.5% across district courts in the first eight years after the Court's decision in *eBay*).

significantly more likely to affirm injunction-granting decisions over injunction-denying ones.[241] Property rules—and the associated asymmetrical moral assumptions—still reign supreme. To wit, when reviewing injunction decisions, the Federal Circuit has rejected outright the economics of holdup theory in favor of moral desert; district courts are told to "ignore[] the expenses . . . incurred in creating the infringing products," and the "cost of redesigning the infringing products."[242] Or, more succinctly: "[A defendant] is not entitled to continue infringing simply because it successfully exploited its infringement."[243]

What's more, the ground that *has* been lost to liability rules is occupied almost entirely by a longstanding target of moral approbation anyway: patent trolls. Less pejoratively, trolls are also sometimes labeled non-practicing or patent-assertion entities—but the ubiquity of the former name speaks volumes for their perceived moral position. And indeed, empirical studies place the injunction success rate of these actors as low as *seven percent*.[244] Although some scholars have defended this categorical distinction on independent economic grounds,[245] that defense has shortcomings on its own terms.[246] And, crucially, this post-hoc economic rationalization does not appear to be actually motivating district courts' injunction decisions. In practice, district courts *reject* a truly categorical approach and instead take pains to distinguish between "good"[247] non-practicing entities (like

241. *See* Ryan T. Holte & Christopher B. Seaman, *Patent Injunctions on Appeal: An Empirical Study of the Federal Circuit's Application of* eBay, 92 WASH. L. REV. 145, 188–93 (2017) (using data from the same time period, finding an affirmance rate of eighty-eight percent for injunction-granting decisions, an affirmance rate of fifty-three percent for injunction-denying decisions, and a statistically significant correlation between the district court's injunction decision and the outcome on appeal after controlling for other variables).

242. *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 863 (Fed. Cir. 2010).

243. *Id.*

244. Colleen V. Chien & Mark A. Lemley, *Patent Holdup, the ITC, and the Public Interest*, 98 CORNELL L. REV. 1, 10–11 (2012); *see also* Seaman, *supra* note 240, at 1988–89 (finding an injunction grant rate for trolls of sixteen percent across district courts in the first eight years after the Court's decision in *eBay*).

245. *See, e.g.*, Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2008 (2007) ("The potential for an injunction against a whole product can and does permit so-called patent trolls to hold up defendants by threatening to enjoin products that are predominantly noninfringing.").

246. *See, e.g.*, John M. Golden, Commentary, *"Patent Trolls" and Patent Remedies*, 85 TEX. L. REV. 2111, 2116 (2007) (critiquing Lemley and Shapiro's model).

247. *See, e.g.*, *Commonwealth Sci. & Indus. Research Org. v. Buffalo Tech., Inc.*, 492 F. Supp. 2d 600, 607 (E.D. Tex. 2007) ("Research institutions, such as [plaintiff], make substantial scientific advances. The work of research institutions is often at the forefront of scientific awareness. Although their work may not always have immediate applications, the work of research institutions has produced enormous

universities or individual inventors) and "bad"[248] non-practicing entities (i.e., trolls). In summation, despite nominal pushback, the moral dimensions of injunctive relief—from how often it is granted and to whom—persist.

C. Doctrine of Equivalents

Taking a step back from the forms of relief, it is worth separately examining the scope of what constitutes patent infringement in the first place. In a standard, "literal infringement" suit, the plaintiff-patentee must show that the defendant's product or method shares—identically and exactly—every single element of one of the patent claims.[249] Where the plaintiff cannot show literal infringement, however, the defendant may still be liable under the doctrine of equivalents.[250] Infringement under the doctrine of equivalents requires only that each element of the claim at issue have a "substantial equivalent" in the accused product or method.[251] That is, for each element of the claim, if the accused product or method "performs substantially the same function . . . in substantially the same way, to produce substantially the same result," the defendant will be found liable.[252] The doctrine of equivalents, when it applies, thus relaxes the primacy of claim language itself in favor of broader, function-over-form considerations. But those considerations—as well as the overall force of this doctrine—have ebbed and flowed considerably over time, in ways that parallel the utilitarian-moral dichotomy explored thus far.

The first significant application of the doctrine of equivalents to modern patent claim language was in 1950, with Justice Jackson's opinion in *Graver Tank & Manufacturing Co. v. Linde Air Products*

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benefits to society in the form of new products and processes. Because the work of research institutions such as [plaintiff] is often fundamental to scientific advancement, it merits strong patent protection.").

248. *See, e.g.*, *Ricoh Co. v. Quanta Comput., Inc.*, No. 06-CV-426-BBC, 2010 WL 1607908 at *1–2 (W.D. Wis. Apr. 19, 2010) ("Plaintiff is correct that it is possible for a nonpracticing entity to satisfy the four-factor test. . . . Of course, plaintiff is not a researcher or a self-made inventor. Rather, plaintiff may be more akin to an entity that . . . 'use[s] patents . . . as a bargaining tool to charge exorbitant fees . . . .'") (quoting *eBay v. Merchexchange, LLC*, 547 U.S. 388, 396-97 (Kennedy, J., concurring)).

249. *Southwall Tech., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995) ("To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.").

250. *See, e.g.*, *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997).

251. *See, e.g.*, V*ehicular Tech. Corp. v. Titan Wheel Intern., Inc.*, 141 F.3d 1084, 1089 (Fed. Cir. 1998).

252. *Id.* (citing *Warner-Jenkinson*, 520 U.S. at 29).

Co.[253] The patent at issue in that case covered a particular electric welding process, including which fluxes to use: "a combination of alkaline earth metal silicate and calcium fluoride."[254] The accused process was identical, "except that it substitute[d] silicates of calcium and manganese—the latter not an alkaline earth metal" by any literal definition.[255] Substantial testimony from metallurgists and chemists in the field established, however, that "in the sense of the patent," manganese could be used "as an alkaline earth metal"; their chemical reactions are sufficiently similar and they can generally "serve the same purpose" in fluxes.[256] The Court thus found the accused process to infringe the patent, despite the textual gap in the claims, as a matter of moral desert and justice: "One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to *conceal and shelter the piracy*. . . . To temper unsparing logic and prevent an infringer from *stealing the benefit* of the invention, a patentee may invoke this doctrine."[257] The Court's focus, in other words, was entirely on preventing bad actors from receiving ill-gotten gains at the expense of the (presumptively deserving) patentee. Economic or utilitarian considerations writ large, on the other hand, are nowhere to be found in the opinion.

The next time the Supreme Court addressed the doctrine of equivalents, some fifty years later in *Warner Jenkinson Co. v. Hilton Davis Chemical Co.*,[258] it took a different approach. In the intervening years, the Federal Circuit had the opportunity to adjudicate numerous claims of infringement under the doctrine of equivalents—with mixed results for plaintiffs.[259] Increasingly, the Federal Circuit expressed the notion that the doctrine of equivalents had become too broad in

253. 339 U.S. 605 (1950). The Court's opinion nearly a century earlier, in *Winans v. Denmead*, 56 U.S. 330 (1853), is largely credited with the true genesis of the doctrine of equivalents. *See generally* CHISUM, *supra* note 187, at OV-7. That case, however, predates entirely the modern structure of patent claim language; a more detailed discussion is thus omitted for the sake of brevity. *See generally* Patent Act of 1870, ch. 230, 16 § 26, Stat. 198 (replacing central claiming with contemporary "peripheral claim[ing]").

254. *Graver Tank*, 339 U.S. at 610.

255. *Id.*

256. *Id.* at 610–11.

257. *Id.* at 607–08 (emphases added).

258. 520 U.S. 17 (1997).

259. *Compare Hughes Aircraft Co. v. United States*, 717 F.2d 1351 (Fed. Cir. 1983) (reversing the district court's denial of infringement under the doctrine of equivalents for taking an overly narrow approach), *and Black & Decker, Inc. v. Hoover Serv. Ctr.*, 886 F.2d 1285 (Fed. Cir. 1989) (same), *with Slimfold Mfg. Co. v. Kinkead Indus.*, 932 F.2d 1453 (Fed. Cir. 1991) (reversing the district court's finding of infringement under the doctrine of equivalents as impermissibly broad).

practice, at risk of swallowing infringement analysis entirely.[260] Against that backdrop, the Supreme Court nevertheless affirmed the continued viability of the doctrine of equivalents, but predicated its analysis on the somewhat stricter approach taken by the Federal Circuit, and began to distance itself from its own prior, moralizing framework: "To be sure, *Graver Tank* refers to the prevention of copying and piracy when describing the benefits of the doctrine of equivalents. That the doctrine produces such benefits, however, does not mean that its application is limited only to cases where those particular benefits are obtained."[261]

Only five years later, the Supreme Court would again address the doctrine of equivalents in *Festo Corp. v. Shoketsu Kinzoku Kogyu Kibushiki Co.*[262] And again, the Court distanced itself from an approach based on moral desert, now justifying the doctrine and its bounds by an explicit focus on utilitarian reasoning:

> If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, *and its value to investors could be destroyed* by simple acts of copying. For this reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources, but is not necessarily the most efficient rule. . . . It is true that the doctrine of equivalents renders the scope of patents less certain. . . . *[T]his uncertainty [is] the price of ensuring the appropriate incentives for innovation* . . . .[263]

This strictly economic focus was, in turn, embraced by the Federal Circuit in its own jurisprudence.[264]

If the doctrine of equivalents's arc had ended here, it would perhaps serve as a counterexample to the utilitarian-moral dichotomy presented thus far: an infringement rule based on morality, replaced by one based on economic efficiency. But since that replacement, the

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260. *See, e.g.*, *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991) ("[I]f the public comes to believe . . . that the language of patent claims can never be relied on, and that the doctrine of equivalents is simply the second prong of every infringement charge . . . , then claims will cease to serve their intended purpose."); *Tex. Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1572 (Fed. Cir. 1986) ("[The doctrine of equivalents] constitutes a deviation from the need of the public to know the precise legal limits of patent protection without recourse to judicial ruling.").

261. *Warner Jenkinson*, 520 U.S. at 34–35.

262. 535 U.S. 722 (2002).

263. *Id.* at 731–32 (emphases added).

264. *See, e.g.*, *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1016–17 (Fed. Cir. 2006); *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1357–58 (Fed. Cir. 2005).

doctrine of equivalents has instead quietly fizzled out into near extinction.[265] Empirical scholarship in particular confirms a significant decline over recent decades in successful doctrine of equivalents infringement claims.[266] Practitioner media, meanwhile, goes so far as to suggest the "impossibility"[267] of making a winning claim under the "dead"[268] doctrine.

This decline suggests two possibilities. First, rather than saving the doctrine of equivalents, the transition to a utilitarian framework acted as a further hastening factor in its demise. Like transferring a plant to the wrong type of soil, an infringement doctrine based first and foremost on economic principles only finds more difficulty and tension if surrounded by generally moralizing rules. On the other hand, the transition to a utilitarian framework may have been a *symptom* of the doctrine of equivalents' declining relevance. Only after seeing pushback and problems with the doctrine did the Court try a contrasting, Hail-Mary approach. And, of course, a misfit or thematic exception with minimal footprint is more likely to be tolerated (or overlooked) than made to fit the pattern. Either way, it is worth emphasizing that the doctrine of equivalents—perhaps the strongest plausible counterexample to the general pattern of persistent moral relevance in infringement—has, *coincidentally*, been minimized to the point of extinction.

D. Inequitable Conduct

Turning to defenses against infringement, when a defendant can show that the plaintiff-patentee failed to prosecute its patent-in-suit in good faith, they will not be found liable—instead, the entire patent becomes unenforceable.[269] The inequitable conduct defense arose out of

265. *See, e.g.*, John R. Allison & Mark A. Lemley, *The (Unnoticed) Demise of the Doctrine of Equivalents*, 59 STAN. L. REV. 955, 958 (2007) ("[T]he doctrine of equivalents was already near death by the late 1990s. . . . That became even more true after 2000 . . . . In fact, district courts are more likely to reject doctrine of equivalents claims today than ever before.").

266. *See, e.g.*, *id.*; David L. Schwartz, *Explaining the Demise of the Doctrine of Equivalents*, 26 BERKELEY TECH. L.J. 1157 (2011); Lee Petherbridge, *On the Decline of the Doctrine of Equivalents*, 31 CARDOZO L. REV. 1371 (2010).

267. *See, e.g.*, Dennis Crouch, *Impossibility of the Doctrine of Equivalents?*, PATENTLYO (Aug. 2, 2017), https://patentlyo.com/patent/2017/08/impossibility-doctrine-equivalents.html [https://perma.cc/XKV8-HKUS].

268. *See, e.g.*, Davis Kuelthau, *Raising an Ensnarement Defense Defeats the Doctrine of Equivalents*, NAT'L L. REV. (Feb. 1, 2018), https://www.natlawreview.com/article/raising-ensnarement-defense-defeats-doctrine-equivalents [https://perma.cc/4PQT-6GPJ].

269. Menell, Lemley & Merges, *supra* note 1, at 415.

the familiar doctrine of unclean hands;[270] if a patentee engaged in egregious conduct such as perjury[271] or suppression of evidence[272] related to the patent's validity, the infringement suit would be dismissed outright as a matter of equity. The doctrine's roots are, in other words, unambiguously moral. In the Supreme Court's own telling in one of the earliest such cases, "if the conduct of the plaintiff be offensive to the dictates of natural justice," or if he "by deceit or any unfair means has gained an advantage," the patent laws will not aid him.[273] Over time, the scope of inequitable conduct broadened to include "not only affirmative acts of misconduct . . . [,] but also the mere nondisclosure of information to the PTO."[274] The remedy, meanwhile, became harsher—unenforceability of the patent-at-issue, not simply dismissal of the suit.[275] But, through it all, the doctrine has not broken from its moral foundation.

Today, at its most basic, the inequitable conduct defense requires two elements, each of which must be proven by the defendant with clear and convincing evidence: (1) intent to deceive; and (2) materiality.[276] Regarding intent, "the accused infringer must prove that the patentee acted with the specific intent to deceive the PTO" through misrepresentation or omission in its application proceedings.[277] For a time, the Federal Circuit used a more flexible, objective standard—essentially, "gross negligence" or a "should have known" standard.[278] The Federal Circuit would eventually come to reject that approach in favor of a return to strictly subjective intent,[279] recognizing in particular inequitable conduct's clear moral freight: "[I]nequitable conduct charges cast a dark cloud over the patent's validity and paint the

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270. *See Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1285 (Fed. Cir. 2011) (en banc); Robert J. Goldman, *Evolution of the Inequitable Conduct Defense in Patent Litigation*, 7 HARV. J.L. & TECH. 37, 46–51 (1993).

271. *See, e.g.*, *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816–20 (1945).

272. *See, e.g.*, *Keystone Driller Co. v. Gen. Excavator Co.*, 290 U.S. 240, 243–48 (1933).

273. *Id.* at 244–45.

274. *Therasense*, 649 F.3d at 1287; *see, e.g.*, *Monsanto Co. v. Rohm & Haas Co.*, 456 F.2d 592, 599 (3d Cir. 1971) (quoting *Stewart v. Wyo. Cattle Ranch Co.*, 128 U.S. 383, 388–89 (1888)) ("Concealment and nondisclosure may be 'evidence of and equivalent to a false representation, because the concealment or suppression is, in effect, a representation that what is disclosed is the whole truth.'").

275. *See, e.g.*, *Kingsdown Meds. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 874–75 (Fed. Cir. 1988).

276. *Star Sci. Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1365 (Fed. Cir. 2008).

277. *Therasense*, 649 F.3d at 1290 (citing *Kingsdown*, 863 F.2d at 876).

278. *J.P. Stevens & Co., Inc. v. Lex Tex Ltd.*, 747 F.2d 1553, 1560 (Fed. Cir. 1984).

279. *Kingsdown*, 863 F.2d at 876–77.

patentee as a bad actor. Because the doctrine focuses on the moral turpitude of the patentee with ruinous consequences for the reputation of his patent attorney, it discourages settlement and deflects attention from the merits . . . ."[280] Beyond the court's own language, recall that this focus on subjective knowledge gives *functional* primacy to moral concerns over economic interests, as outlined in the discussion supra regarding enhanced damages.[281] That is, the doctrine's primary effect is to punish individual bad actors—with actual ill intent—rather than construct a landscape of incentives that, in the aggregate, minimize risk and harm to the public.

Regarding materiality, the accused infringer must show that "the PTO would not have allowed a claim" of the patent-at-issue but for the misrepresentation or omission.[282] At first blush, this prong would seem to be balanced for efficiency: the doctrine only kicks in when the inequitable conduct actually provided a benefit to the patentee. Put differently, bad-faith conduct that was essentially irrelevant to the patent grant decision does not actually harm the public—so, from a strictly utilitarian standpoint, why bother punishing it? In comparison, a Kantian or Lockean approach would almost certainly punish an affirmative act of dishonesty—whether or not it necessarily led to ill-gotten gains. Lo and behold, however, one finds that just such a moral backdoor is built into the materiality prong: "Although but-for materiality generally must be proved to satisfy the materiality prong of inequitable conduct, this court recognizes an exception in cases of affirmative egregious misconduct . . . [such as] the filing of . . . false affidavit[s]."[283] In other words, for sufficiently bad actors, the courts are happy to set aside the otherwise dispassionate utilitarian reasoning of no-harm-no-foul. Observe, moreover, that this backdoor is a departure from efficiency on the procedural level, by replacing an otherwise (relatively) clear, bright-line rule with one that still spawns exceedingly costly line-drawing litigation.[284] Infringement doctrine thus declines to set aside moral considerations once again.

E. Prior Use

If an accused infringer can show that they were already using the invention at issue *before* the patent was granted, they will not be found

280. *Therasense*, 649 F.3d at 1288.

281. *See supra* notes 219–224 and accompanying text.

282. *Therasense*, 649 F.3d at 1291.

283. *Id.* at 1292–93.

284. *See, e.g.*, *Outside the Box Innovations, LLC v. Travel Caddy, Inc.*, 695 F.3d 1285 (Fed. Cir. 2012).

liable for subsequent infringement.[285] The precise boundaries of this prior use defense have shifted over time[286]—at one point, disappearing entirely.[287] But it is currently at its broadest scope in more than a half-century, now applying against patents of any and all subject matter.[288] The expansion of the prior use defense reflects yet another clear emphasis on moral, rather than economic, concerns when it comes to infringement.

To see why, consider the circumstances under which a prior use defense might arise. Prior *public* uses invalidate patents outright via the novelty requirement, rather than acting as a defendant-specific shield against infringement liability.[289] So the real salience of the prior use defense is in protecting the interests of *secret* users specifically.[290] But that renders the prior use defense a truly odd fit with the general utilitarian theory of patent law. On the margins, it disincentivizes public disclosure of inventions; a firm can quietly reap the profits of its discovery in perpetuity rather than the limited term of a patent, knowing that—even if another firm makes the same discovery—it will face no risk of losing the right to practice.[291] In turn, one would tend to expect a greater degree of wastefully redundant research efforts (and an

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285. 35 U.S.C. § 273(b)(1) (2003).

286. *Compare* Patent Act of 1839, ch. 88 § 7, 5 Stat. 353–55 (1839) ("[E]very person . . . who has . . . purchased or constructed any newly invented machine, manufacture, or composition of matter, prior to the application by the inventor or discoverer for a patent, shall be held to possess the right to use, and vend to others."), *with* American Inventors Protection Act of 1999, H.R. 1907 106th Cong. § 302(a) (1999) (limiting the prior use defense to patents covering "method[s] of doing or conducting business"). *See generally* Jeff Mikrut, *How the America Invents Act Revived the Prior-User Defense*, ABA SEC. INTELLECTUAL PROPERTY (Feb. 20, 2012), https://www.americanbar.org/groups/litigation/committees/intellectual-property/articles/2012/how-america-invents-act-revived-prior-user-defense/ [https://perma.cc/J2QG-JF6F].

287. *See* Patent Act of 1952, Pub. L. No. 82-593, § 282, 66 Stat. 792, 812 (1952).

288. *See generally* Jacob Neu, *Patent User Prior Rights: What's the Fuss?*, 66 VAND. L. REV. EN BANC 1, 1 (2013) ("Another change, however, . . . represents a historic shift: the expansion of prior user rights to all patents.").

289. *See* 35 U.S.C. § 102(a)(1) (2017) ("A person shall be entitled to a patent unless . . . the claimed invention was patented, described in a printed publication, *or in public use*, on sale, or otherwise available to the public before the effective filing date of the claimed invention.") (emphasis added).

290. *See, e.g.*, Leslie M. Hill, Note, *Prior Use Defense: The Road to Hell Is Paved with Good and Bad Intentions*, 10 FED. CIR. B.J. 513, 519–20 (2001) (contrasting "public use or the placing on sale of an invention," which "invalidates a patent," with "secret use," which "provide[s] a defense to infringement").

291. *See* James R. Barney, *The Prior User Defense: A Reprieve for Trade Secret Owners or a Disaster for the Patent Law?*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 261, 265 (2000) ("The most glaring problem with section 273 is that it ignores the constitutional mandate to 'promote the Progress of Sciences and the useful Arts' because it encourages secreting, rather than disclosing, of new inventions.").

overall slowing of innovative progress), all in exchange for zero public disclosure benefit.

A plausible argument can be made that this defense merely enables firms the flexibility to efficiently opt out of patent protection for marginal inventions, such as minor internal process improvements, and leverage trade secret law instead.[292] This rationalization was far more compelling when the prior use defense was subject-matter limited—covering only "method[s] of doing or conducting business."[293] But today, the defense covers any and all subject matter. Accordingly, even landmark discoveries can be opted out of the patent system for potentially superior returns; "[b]y maintaining the secrecy of the concept, the business hopes that the secrecy can be preserved beyond the life of, or provide greater protection than, any patent that can be obtained."[294] This is on top of at least two second-order distortions. First, smaller, non-integrated businesses tend to be particularly disadvantaged by prior user rights, due to their comparative inability to perform everything secretly in-house.[295] Second, the defense eliminates the incentive to challenge bad patents among those with the best informational advantage to do so—industry participants involved in the invention's actual development and practice.[296]

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292. *See, e.g.*, *Prior User Rights (Relative to Patents): Hearings on S. 2272 Before the Subcomm. on Intellectual Prop. and Judicial Admin. of the House Comm. on the Judiciary of the H.R.*, 103rd Cong. (1994) (statement of Bruce A. Lehman, Comm'r of Patents and Trademarks) ("[The] goal of realizing the benefits of innovation is best served by policies that provide American companies with maximum flexibility . . . . Prior user rights . . . will permit companies to choose with confidence . . . the most commercially sound approach to commercially exploiting the innovation."); Gary L. Griswold et al., *Prior User Rights: Neither a Rose nor a Thorn*, 2 U. BALT. INTELL. PROP. L.J. 233, 234 (1994) (noting that "[t]he monetary costs of obtaining and maintaining a global portfolio of patents may be prohibitively high relative to the expected commercial return," especially considering "[t]he costs of litigation to enforce").

293. American Inventors Protection Act of 1999, H.R. 1907 106th Cong. § 2(a) (1999).

294. Robert L. Rohrback, *Prior User Rights: Roses or Thorns*?, 2 U. BALT. INTELL. PROP. L.J. 1, 6 (1993).

295. *See* David H. Hollander, Jr., *The First Inventor Defense: A Limited Prior User Right Finds Its Way Into US Patent Law*, 30 AIPLA Q.J. 37, 41–42 (2002); Rohrback, *supra* note 294, at 20 ("[T]he aforementioned consequences fall far more heavily on individual inventors, small businesses, and non-corporate users of the patent system . . . [because they] are usually dependent upon sources of risk capital and/or licensing arrangements.").

296. *See, e.g.*, Rohrback, *supra* note 294, at 20 ("[A] possessor of prior user rights would have no incentive to prove invalidity of patents based on facts known to it. It is not in the public interest to have invalid patents languishing in the art to deter others from competing."); Barney, *supra* note 291, at 272–73 ("Indeed, a rational prior user might actually *want* a second inventor to obtain a patent on his invention because the trade secret can then be kept out of the public domain for up to twenty additional years, with the first inventor enjoying the enviable position of a royalty-free licensee.

Moral justifications, on the other hand, are a remarkably easy fit for the prior use defense. As Locke might describe it, the prior-using firm has a right to consume the apples it already harvested (with no help from or reliance on the second-inventor patentee). Or, per Kant and Hegel, the prior user has already reified its will through intention and action in the external world; to take the right to use away due to a second-inventor patentee would, in a concrete sense, harm the prior user. These frameworks furthermore help to explain two of the principal limitations on the prior use defense. First, the prior use must be continuous from before the patentee's filing date through to the time of the activity being defended post-grant.[297] Second, the prior use right is essentially non-transferrable.[298] The prior use defense, in other words, is fundamentally centered on the *individual* and his *ongoing relationship* to the invention at issue—hallmarks of personhood theory in particular. It is decidedly not the sort of fungible entitlement, flexibly alienable in the marketplace to its most efficient holder, that one might otherwise expect from a typical law-and-economics approach. In that way, the prior use defense forms the mirror image of the simultaneous or independent invention problem explored in Section II.C. That is, on the validity side, patent law declines to recognize the labors and personhood of the inventor that happens to come in second place in the race to the patent office—at the end of the day, they receive no piece of the reward. But the infringement side deliberately and explicitly engages in precisely such recognition.

In summary, the rules governing relief for, scope of, and defenses to patent infringement frequently seem to maintain a deliberate resonance with freestanding moral frameworks—often deemphasizing utilitarian reasoning as a result. Validity doctrine, as explored earlier, has more fully embraced utilitarianism and, in multiple cases, marginalized moral theory instead. Part IV takes up the natural next question: why has such a fault line manifested in patent law?

IV. CAUSES AND INFLUENCES

Parts II and III revealed the depth of philosophical differences between patent validity and patent infringement. Whereas utilitarianism has come to dominate the principal doctrines concerning validity, the core doctrines concerning infringement have a clear and persistent thread of moral reasoning. This Part seeks an explanation for that

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This perverse incentive may cause trade secret owners to essentially look the other way when confronted with a second inventor's patent, even one that is clearly invalid.") (emphasis added) (footnote omitted).

297. 35 U.S.C. § 273(e)(4) (2012).

298. *See* § 273(e)(1)(A)–(B).

reality. It explores three overlapping causes, and suggests that each likely plays a role: the parallel divide in patent adjudicators, an inheritance from traditional property law, and the need for patents to function as both public and private law.

A. Dichotomous Adjudication

1. THE PTO

The vast majority of patent validity decision making occurs at the Patent and Trademark Office. On top of reviewing a tremendous number of initial patent applications,[299] the PTO is now responsible for adjudicating a variety of post-grant validity challenges.[300] Combining these two categories offers a rough quantitative picture. In 2016, for example, the PTO received 605,571 initial patent applications,[301] combined with more than 1,500 petitions for post-grant challenges.[302] In comparison, using Lex Machina data, there were only 10,392 patent cases pending in district courts in 2016—with no guarantee that patent *validity* was necessarily challenged in any given one.[303] When restricting the view to validity adjudication that actually reaches the final merits and is appealed, the extreme disparity shrinks somewhat, but PTO decision making still outnumbers district court decision making more than two-to-one.[304]

Much scholarship has been (and will continue, no doubt) to be written on the many adjudicatory differences between the PTO and district courts. Of chief importance here is the PTO's fundamentally *technocratic* position. Administrative patent judges are required by statute to possess "competent . . . scientific ability,"[305] and in practice "[a]ll of [them] have specialized technical degrees . . . and . . .

299. 35 U.S.C. § 111 (2012).

300. *See, e.g.*, 35 U.S.C. §§ 311 (*inter partes* review); 321(b) (post-grant review); Leahy-Smith America Invests Act, Pub. L. No. 112-29, § 18, 125 Stat. 329–31 (CBM review) (2011) (codified at 35 U.S.C. § 321 note).

301. WORLD INTELLECTUAL PROPERTY ORG., WORLD INTELLECTUAL PROPERTY INDICATORS *2017* at 29, https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2017.pdf [https://perma.cc/P7X6-FJQR].

302. USPTO, PATENT TRIAL AND APPEAL BOARD STATISTICS 5 (2016), https://www.uspto.gov/sites/default/files/documents/aia_statistics_september2016A.pdf [https://perma.cc/SU5P-CZSJ].

303. *See* LEXMACHINA (searching "patent" tagged cases between January 1, 2016 and December 31, 2016).

304. *See generally* Matthew Sipe, *Experts, Generalists, Laypeople—and the Federal Circuit*, 32 HARV. J.L. & TECH. 575 (2019) (using FY2015 and FY2016 data).

305. 35 U.S.C. § 6 (2012).

experience"[306] that are brought to bear on their specific case assignments.[307] Federal district court judges, despite their innumerable virtues, generally do not have any background in the sciences at all,[308] let alone a docket intentionally curated to reflect that background.

The PTO's position thus lends itself more naturally to answering the kinds of questions demanded by a utilitarian validity framework. Was the invention at issue particularly costly to develop, or otherwise considered unlikely to succeed *ex ante* by those with experience in the field? Is the invention in a research area that is less responsive to external financial incentives? Has the invention since become an industry standard? It seems difficult to dispute that relevant scientific training makes answering these questions far easier. In contrast, the PTO is somewhat ill-positioned to address the *moral* quandaries that inventions may present. Even setting aside the fact that administrative patent judges are scientists, not philosophers or ethicists, the timing alone of their input makes moral determinations more difficult; patent applications are, by necessity, filed well before the invention has been let loose into society and all potential uses or misuses (and good or bad effects) of the invention are known.

Little surprise then that the PTO itself has expressed a relative unwillingness to address moral issues in its adjudicatory processes. As early as 1977, the PTO stated: "[W]e think this Office should not be the agency which seeks to enforce a standard of morality . . . ."[309] Likewise, when determining the patentability of a human-animal chimera in 1997, despite early suggestions that it would reject the application on freestanding moral grounds,[310] the PTO ultimately relied

306. Gene Quinn, *PTAB Chief Judge Defends APJs*, IPWATCHDOG (Mar. 8, 2018), http://www.ipwatchdog.com/2018/03/08/ptab-chief-judge-defends-apjs/id=94528/ [https://perma.cc/RK8B-U3QD] (statement by PTAB Chief Judge David Ruschke).

307. *See, e.g.*, Brief Amicus Curiae of Patent Trial and Appeal Board Bar Ass'n at 6, *Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC*, 138 S. Ct. 1365 (2018) (No. 16-712) ("These judges have special technical and legal expertise, and at least one of them typically has a technical background and work experience related to the subject matter of the patent in question.").

308. Though a rough measure, the Federal Judicial Center's *Biographical Directory of Article III Federal Judges* includes information on undergraduate degrees. https://www.fjc.gov/history/judges. That database indicates that, of 1305 sitting federal judges, only sixteen percent (209) possess a minimum of an undergraduate science degree (B.S., B.S.E., B.S.E.E., B.Sc., A.S., A.A.S.). FED. JUD. CTR, *Biographical Directory of Article III Federal Judges*, https://www.fjc.gov/history/judges (click download an export, and then click the education hyperlink). *See generally* Peter Lee, *Patent Law and the Two Cultures*, 120 YALE L.J. 2, 4–11 (2010).

309. *Ex Parte Murphy*, 200 U.S.P.Q. (BNA) 801, 803 (Bd. App. 1977).

310. Bureau of Nat'l Aff., Inc., *'Morality' Aspect of Utility Requirement Can Bar Patent for Part-Human Inventions*, 55 PAT. TRADEMARK & COPYRIGHT J. NEWS 555, 556 (1998) (quoting statement of then-Commissioner of Patents Bruce Lehman)

on fairly standard § 101 reasoning.[311] As former assistant commissioner for patents Lawrence Goffney stated at the time, the PTO's role is limited to "tell[ing] us it can be done."[312] "Whether or not to do it is another matter altogether, and not the concern of the PTO."[313] More recently, regarding the patentability of human DNA, the PTO flatly held: "Several comments state that patents should not issue for genes because the sequence of the human genome is at the core of what it means to be human and no person should be able to own/control something so basic. . . . The comments are not adopted."[314] Similar calls to block the patentability of mammalian cloning as offensive to "public morality"[315] have been likewise summarily rejected.[316]

This tracks a mirror-image experience in the European patent system. As noted earlier, the European Patent Convention explicitly requires that the potential effects on "ordre public" and "morality" be considered as a condition for patentability.[317] And yet, the European Patent Office has repeatedly expressed a hesitance to actually *rely* on that provision, precisely "to avoid the difficult question of determining issues that it clearly feels ill-equipped to address."[318] For example, in a highly contentious case involving patents on isolated human genes, the EPO ultimately allowed the patent, stating: "Whether or not human genes should be patented is a controversial issue on which many persons have strong opinions[, but] . . . the EPO is not the right institution to decide fundamental ethical questions."[319] Likewise, when adjudicating one of the first disputes over the patentability of life forms—in this case, a plant—the EPO explained:

("[We will grant] no patents on monsters."); *see generally* SHOBITA PARTHASARATHY, PATENT POLITICS: LIFE FORMS, MARKETS, AND THE PUBLIC INTEREST IN THE UNITED STATES AND EUROPE 92–93 (2017).

311. Specifically, the PTO found that human beings did not constitute a "process, machine, manufacture, or composition of matter" within the meaning of § 101 as intended by Congress. *See* Bureau of Nat'l Aff., Inc., *Patent Application is Disallowed as 'Embracing' Human Being*, 58 PAT., TRADEMARK & COPYRIGHT J. 203 (1999).

312. PARTHASARATHY, *supra* note 310, at 93.

313. *Id.*

314. Utility Examination Guidelines, 66 Fed. Reg. 1093, 1094 (Jan. 5, 2001).

315. Bureau of Nat'l Aff., Inc., *Group Faults PTO for Issuing Patent on 'Method of Producing Cloned Mammal*,' 64 PAT. TRADEMARK & COPYRIGHT J. 81 (2002).

316. U.S. Patent No. 6,211,429 B1 (Apr. 3, 2001) ("Method[] for . . . producing a cloned mammal").

317. *See supra* notes 150–152 and accompanying text.

318. Cynthia M. Ho, *Splicing Morality and Patent Law: Issues Arising from Mixing Mice and Men*, 2 WASH. U. J.L. & POL'Y 247, 280 (2000).

319. *Relaxin*, 1995 O.J. EPO 388, 402–03.

> The Opponent argues that . . . it cannot be right for the EPO, a public body, to "reward" the Proprietor with a patent for immoral subject-matter such as that of the disputed patent. However, it must be emphasized that patent law was *never designed to be used as a moral instrument* with which to "reward" only inventions perceived as ethical and thus attempt to influence whether certain types of research are carried out or not. It is indeed singularly inappropriate for this purpose. . . . The technically trained patent examiner, who is *not* a specialist in ethical issues, will find it even more difficult to evaluate in any meaningful way the morality of an invention . . . .[320]

Put simply, even when moral considerations are placed—unambiguously—within the purview of technocratic patent offices, they balk at the prospect of actually playing ethicist. Naturally then in the USPTO's validity decision making, free from even a textual pretense, moral analyses are rarely found.

2. JURIES

Patent *infringement* disputes, on the other hand, are not adjudicated by the PTO—they are entirely a matter for federal district courts. And, in particular, it is juries, not the district court judges, that tend to have the final say in infringement suits that go to trial; juries are responsible for approximately eighty percent of patent infringement verdicts.[321] In practice, it is predominantly patentee-plaintiffs that are responsible for the surge in jury use,[322] and for good reason: jury use is consistently associated with higher damage awards and increased

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320. *Greenpeace UK v. Plant Genetic Systems N.V.* (Opposition Div. EPO 1992), *reported in* 24 INT'L REV. INDUS. PROP. & COPYRIGHT L. 618, 620–21 (1993) (emphasis added).

321. CHRIS BARRY ET AL., 2017 PATENT LITIGATION STUDY: CHANGE ON THE HORIZON? 6 (2017), http://www.ipwatchdog.com/wp-content/uploads/2017/05/2017-Patent-Litigation-Study_PwC.pdf [https://perma.cc/EJ74-KF63] (excluding infringement suits relating to Abbreviated New Drug Applications for outlier reasons); Mark A. Lemley, *Why Do Juries Decide if Patents are Valid?*, 99 VA. L. REV. 1673, 1706 (2013).

322. *See, e.g.*, Kimberly A. Moore, *Jury Demands: Who's Asking?*, 17 BERKELEY TECH. L.J. 847, 855 (2002) ("[P]laintiffs demanded a jury significantly more often than did defendants; plaintiffs demanded a jury in [seventy-one percent] of all cases."); Judge Richard A. Posner, *Why There Are Too Many Patents in America*, THE ATLANTIC (Jul. 12, 2012), https://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725/ [https://perma.cc/FS42-V9GD] ("[P]atent plaintiffs tend to request trial by jury because they believe that jurors tend to favor patentees . . . .").

plaintiff win rates overall.[323] Multiple scholars have explained this trend as a matter of social justice, driven by juror empathy towards an idealized solo inventor; the pro-patentee bias is at its strongest when the plaintiff is an individual suing a large corporation, and the bias all but disappears when the roles are reversed.[324] Jurors likewise tend to "punish" what they perceive to be reprehensible behavior from the defendant above and beyond where the law itself makes such distinctions, such as cases of patent hold-out.[325]

On the flip side, Professors Bernard Chao and Roderick O'Dorisio demonstrate an inverse phenomenon. Using mock juries in a controlled, experimental setting, they show that an accused infringer is more likely to escape liability if the patentee-plaintiff is a non-practicing entity (again, colloquially, "patent troll").[326] Jurors are, in other words, clearly importing heuristics of moral desert, however rough, into their adjudication. Inventors—those closest to the actual Lockean labor or Kantian will behind a patented invention—are disproportionately rewarded. Trolls—several steps removed therefrom, and often perceived as preying upon small businesses without the means to defend themselves[327]—are disproportionately shown the door. And large, deep-

323. *See, e.g.*, BARRY ET AL., *supra* note 321, at 6; Kimberly A. Moore, *Populism and Patents*, 82 N.Y.U. L. REV. 69, 107 (2007); Mark A. Lemley, Jamie Kendall & Clint Martin, *Rush to Judgment? Trial Length and Outcomes in Patent Cases*, 41 AIPLA Q.J. 169, 174–85 (2013); Andrei Iancu & Jay Chung, *Real Reasons the Eastern District of Texas Draws Patent Cases—Beyond Lore and Anecdote*, 14 SMU SCI. & TECH. L. REV. 299, 305 (2011) (finding a nationwide patentee win rate in jury trials of sixty-eight percent).

324. Moore, *supra* note 323, at 82–83; *see also* Colleen V. Chien, *Holding Up and Holding Out*, 21 MICH. TELECOMM. & TECH. L. REV. 1, 22–23 (2014) ("Among patentee groups, the fewer the inventors, the more likely a patentee is to win, suggesting that juries empathize most with the plight of the individual inventor."). It is worth emphasizing that this type of juror bias towards social justice is well-documented throughout the law, not exclusively in patent litigation. *See, e.g.*, Clarence Morris, *Punitive Damages in Tort Cases*, 44 HARV. L. REV. 1173, 1191 (1931) ("[R]ich men do not fare well before juries, and the more emphasis placed on their riches, the less well they fare.").

325. *See, e.g.*, Martha K. Gooding & William C. Rooklidge, *The Real Problem with Patent Infringement Damages*, 91 J. PAT. & TRADEMARK OFF. SOC'Y 484, 485 (2009) ("The patent law provides that damages for infringement are to be awarded in an amount 'adequate to compensate for the infringement . . . . But by the time a jury has concluded that the accused infringer has infringed . . . many jurors clearly are in a mood to punish.") (footnote omitted); *id.* at 486 (quoting one mock juror as saying that "[the defendant] had the option to license the patent and didn't, so now . . . they have to feel the wrath."); *see also* Chien, *supra* note 324, at 23 ("[T]o the juror the consequences are clear: the manufacturer must now be punished for his refusal to license, or in other words, his 'hold-out,' during the negotiation phase.").

326. Bernard Chao & Roderick O'Dorisio, *Testing the White Hat Effect in Patent Litigation*, 27 FED. CIR. B.J. 155, 171–72 (2017).

327. *See, e.g.*, *Patents: Last Week Tonight with John Oliver (HBO)*, YOUTUBE (Apr. 19, 2015), https://www.youtube.com/watch?v=3bxcc3SM_KA; *This American*

pocketed corporations are also at a disadvantage, whether they act as plaintiffs or defendants. Rawls might quibble with the details of implementation on the margins, but would surely find allyship in the juries' general Robin Hood spirit.

Neither the PTO nor juries have the power to make patent law, per se. But their influence on the doctrinal landscape should not be dismissed out of hand. First and foremost, the PTO does have a certain degree of regulatory authority,[328] and a platform from which to influence true congressional law-making through institutional reports and testimony. More fundamentally, law is ineluctably shaped in the shadow of its adjudicators. District court judges are keenly aware of the kinds of questions that layperson juries are more or less well-suited to answer.[329] The legislative history of the AIA is likewise suffused with the notion of comparative adjudicatory competence.[330] Unsurprisingly, then, one finds that the PTO opposed moral considerations in, for

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Life: When Patents Attack!, WBEZ CHICAGO (July 22, 2011), http://www.thisamericanlife.org/radio-archives/episode/441/when-patents-attack.

328. The PTO's entitlement to *Skidmore* deference for its interpretation of the Patent Act, for example, has been fully accepted. *See, e.g.*, *Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office*, 689 F.3d 1303, 1357 (Fed. Cir. 2012) ("[W]e owe deference [to the PTO] . . . commensurate with the 'thoroughness of its consideration and the validity of its reasoning.'") (Bryson, J., concurring in part and dissenting in part) (quoting *Merck & Co. v. Kessler*, 80 F.3d 1543, 1550 (1996)). Moreover, the AIA explicitly granted rulemaking power to the PTO over the "procedures" and "standards" applied in its new post-grant proceedings. *See, e.g.*, 35 U.S.C. §§ 135(b), 316(a)(2),(5),(9), 362(a)(2).

329. *See, e.g.*, *Judicial Panel Discussions on Science and the Law*, 25 CONN. L. REV. 1127, 1145 (1993) (statement of Judge Covello, U.S. District Judge for the District of Connecticut) ("Honest to God, I don't see how you could try a patent matter to a jury. . . . It's factually so complicated."); Warren E. Burger, *The Use of Lay Jurors in Complicated Cases*, Remarks to the Conference of State Chief Justices 3–5 (Aug. 7, 1979); *Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 115 (S.D.N.Y. 1911) (Judge Learned Hand) ("I cannot stop without calling attention to the extraordinary condition of the law which makes it possible for a man without any knowledge of even the rudiments of chemistry to pass upon such questions as these . . . for only a trained chemist is really capable of passing upon such facts.").

330. *See, e.g.*, 157 Cong. Rec. S1352 (Mar. 8, 2011) ("These proceedings are intended to . . . provide additional access to the expertise of the Patent Office on questions of patentability. . . . [A] panel of [PTO] experts is more likely to reach the correct decision on a technical question compared to a jury composed of laypeople."); *Crossing the Finish Line on Patent Reform: What Can and Should be Done: Hearing Before the Subcommittee on Intellectual Property, Competition, and the Internet* 112th Cong. 1 (2011), https://www.uspto.gov/sites/default/files/aia_implementation/hearing-feb11.pdf [https://perma.cc/WY4A-4F8N] ("The whole point is that frequently it is very difficult to argue to a jury why a patent is invalid. We think the Patent Office is the better place to deal with it."); CONG. REC. S5319 (Sept. 6, 2011), https://www.uspto.gov/sites/default/files/aia_implementation/20110906-kyl_rmrks_s5319.pdf [https://perma.cc/E8W6-9EP6] ("[T]he bill creates an inexpensive substitute for district court litigation and allows key issues to be addressed by experts in the field.").

example, utility doctrine[331]—and supported the utilitarian switch to first-inventor-to-file novelty rules.[332] Analogously, one finds that the rules governing infringement damages are frequently keyed to a level of moral discourse that jurors seem to readily understand and internalize.[333] In brief, if the decision makers for validity and infringement are themselves so radically different—the doctrines for which they are responsible will, on balance, follow suit over time.

B. The Heritage of Property Law

Setting adjudicatory structure aside, patent law is also deeply influenced by analogy and reference to traditional, physical property law.[334] Litigants and jurists discuss the "metes and bounds" of patent claims as if they demarcated the boundaries of a plot of land;[335] the act of patent infringement has long been conceptualized as a form of "trespass";[336] and patent law scholars advocating for change often

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331. *See supra* notes 167–69 and accompanying text.

332. *See, e.g.*, Letter from David S. Kappos, USPTO Director, to House Judiciary Committee Chairman Lamar Smith (June 1, 2011), https://www.uspto.gov/sites/default/files/aia_implementation/20110601-letter_smith.pdf [https://perma.cc/7XL9-3U6D] ("The first-inventor-to-file provision simplifies the process of acquiring rights . . . , provides a more transparent and cost-effective process, [and] is consistent with the practices of our trading partners . . . ."); Letter from Gary Locke, Secretary of Commerce, to Senate Judiciary Committee Chairman Patrick Leahy and Ranking Member Jeff Sessions at 3 (Oct. 5, 2009), https://www.uspto.gov/sites/default/files/aia_implementation/locke-letter-oct-05-2009.pdf [https://perma.cc/7CND-P94R] ("The transition would simplify the patent process, reduce legal costs, improve fairness, and make progress towards a more harmonized international patent system . . . [,] lead[ing] not only to enhanced efficiency, but . . . provid[ing] greater predictability, reliability and competitiveness for American innovators."); *see generally supra* notes 81–90 and accompanying text.

333. *Compare supra* Section III.A, *with* notes 322–27 and accompanying text.

334. *See generally* Sarah Rajec, *The Property Misfit in Patent Law*, CARDOZO L. R. (forthcoming) (MAPWIP Works-In-Progress); ROBERT P. MERGES, JUSTIFYING INTELLECTUAL PROPERTY 33–41 (2011); Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 296–30 (1988).

335. *See, e.g.*, *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1367 (Fed. Cir. 2012) ("It is the claims that define the metes and bounds of the patentee's invention.") (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)); USPTO, MANUAL OF PATENT EXAMINING PROCEDURE 2173.02 (2017), https://www.uspto.gov/web/offices/pac/mpep/s2173.html [https://perma.cc/3L5Z-J5FG] ("During prosecution, applicant has an opportunity and a duty to . . . clearly and precisely define the metes and bounds of the claimed invention.").

336. *See, e.g.*, *United States v. Societe Anonyme Des Anciens Etablissements Cail*, 224 U.S. 309, 311 (1912) ("[T]he question being only for the present whether such use was a trespass upon the rights of the claimant . . . ."). More contemporary case law has maintained the analogy as well. *See, e.g.*, *Hoechst-Roussel Pharm., Inc. v. Lehman*, 109 F.3d 756, 759 (Fed. Cir. 1997) ("[T]he claims define the patent owner's property rights whereas infringement is the act of trespassing upon those

suggest importing tools from the property sphere, ranging from nuisance doctrine[337] to adverse possession[338] or eminent domain.[339] A full review of property law itself, commensurate in scope and scale with the preceding analysis of patent law, is beyond the limits of this Article. Nevertheless, a few key phenomena that are already recognized by traditional property scholars offer a degree of explanatory power to the fault line in patent law. The dichotomy between utilitarianism and morality, in other words, may in part be patent law's inheritance as intellectual *property*—a consequence of building patent law, like traditional property, as a right one holds in a thing against the rest of the world.

Consider in detail this "thingness" of property. Though not unchallenged theoretically,[340] and with obvious limitations,[341] defining any property right or obligation requires—at bottom—some degree of reference to the thing that is owned. And it is actions upon the thing, not upon the owner directly, that trigger liability. Property law, in other words, allows some nontrivial distance and disconnect between the rightholder-subject and referent-object. This distance, in turn, has three significant consequences. First, it enhances the possibility of mistaken property violations. A piece of chattel, for example, may bear no obvious sign of ownership—and the owner may be on the other side of the globe. Second, it weakens the intuitive comprehensibility of property rights. On one extreme, imagine an assailant who physically and immediately strikes his victim; on the other, imagine a trespasser that does no perceptible damage to the land itself—whose actions could easily have gone unnoticed entirely. The latter scenario, even the strongest property advocates would agree, requires a greater degree of intellectual legwork to explain its wrongness. Third, it creates practical challenges with respect to enforcement. It would be unthinkable for all property owners to maintain perfect physical security over all that they

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rights."); *see generally* Adam Mossoff, *The Trespass Fallacy in Patent Law*, 65 FLA. L. REV. 1687 (2017).

337. *See, e.g.*, Min-Chiuan Wang, *Nuisance Law and the Doctrine of Equivalents in Patent Law*, 34 SANTA CLARA HIGH TECH. L.J. 110 (2018).

338. *See, e.g.*, Constance E. Bagley & Gavin Clarkson, *Adverse Possession for Intellectual Property*, 16 HARV. J.L. & TECH. 327 (2003).

339. *See, e.g.*, Richard V. Adkisson, *Intellectual Property and Eminent Domain: If Ever the Twain Shall Meet*, 36 J. ECON. ISSUES 41 (2002).

340. *See, e.g.*, Wesley N. Hohfeld, *Fundamental Legal Conceptions as Applied in Legal Reasoning*, 26 YALE L.J. 710, 720–21 (1917) (recharacterizing property law as defining relations between persons, as derived from an overarching theory of rights and duties as perfectly symmetrical).

341. *See, e.g.*, OLE-ANDREAS ROGNSTAD, PROPERTY ASPECTS OF INTELLECTUAL PROPERTY 44 (2018) ("All private legal relations are between persons, as a claim may only be made against a (legal) person and not against a piece of land or a chattel.").

own against the world; for the owners of particularly large parcels, or the owner of many scattered chattel, it would be outright impossible. Even assuming the existence of a robust and active police force, the need for a large measure of voluntary compliance is readily apparent, lest the costs of such force swamp any gains.

After this dim view, how is it then that property law functions at all? Professors Merrill and Smith offer a compelling view that the infusion of property ownership with a moral dimension is what offsets the distance problem—the *in rem* problem:

> [P]roperty rights must be communicated to a wide and disparate group of potential violators . . . . [T]hey must be easily comprehended and must resist possible misinterpretation. Law, including criminal prosecution and civil enforcement actions, is almost certainly inadequate to achieve this degree of coordination and compliance. . . . *Property can function as property only if the vast preponderance of persons recognize that property is a moral right* . . . . [T]he morality upon which it rests must be simple and accessible to all members of the community. . . . [I]t seems highly unlikely that such a morality will be captured by many forms of utilitarianism. Pragmatism is too uncertain, and case-specific cost-benefit analysis too demanding and error-prone, to supply the kind of robust and widely accepted moral understanding needed to sustain a system of property.[342]

Put differently, it may simply be *impossible* to stamp out all vestiges of non-utilitarian morality in a property regime. Without a comprehensible moral hook, the violators—mistaken or intentional—would be far too numerous and widespread as to be checked by reasonable levels of enforcement.

Naturally, the question arises of how and where this morality actually manifests and persists in property law. Keeping to broad strokes, consider first the "infringement" side: violations of property rights. Specifically, observe the general lack of what might be called "efficient trespass";[343] in contrast to, say, contract law, there is no full-throated tolerance of intentional property violations that, on balance, promote higher-valued use. Adverse possession doctrine arguably comes closest in bad-faith jurisdictions, and has no shortage of

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342. Thomas W. Merrill & Henry E. Smith, *The Morality of Property*, 48 WM. & MARY L. REV. 1849, 1850–51 (2007) (emphasis added).

343. *See generally* Lee Anne Fennell, *Efficient Trespass: The Case for "Bad Faith" Adverse Possession*, 100 NW. U.L. REV. 1037, 1038 (2006) (noting and criticizing the tendency of trespass doctrine in practice to prioritize moral considerations).

utilitarian defenders,[344] but it does not operate as a carve-out from trespass liability per se—it transfers *ownership* outright.

Compared to the true defense (in the sense of excuse) of necessity, one quickly sees the importance of morality. Lodestar cases excusing trespass highlight the indignity and injustice that would come from preventing a homeless man seeking lifesaving shelter against the cold[345] or forcing the passengers on a boat to unmoor into a dangerous storm.[346] But whereas utilitarianism would be equally concerned with missed *opportunities* (in the sense of misallocated resources and inefficiencies), averting tremendous *losses* is necessity's sole purview. The ratchet only goes one way. Even beyond necessity, ad hoc carve-outs from trespass are equally couched in moralizing terms. In another classic case, for example, the Supreme Court of New Jersey held that it was not a trespass for an NGO field agent to meet with and offer legal advice to migrant workers on farm property, even though it was against the explicit wishes of the property owner:

> Property rights serve human values. They are recognized to that end, and are limited by it. Title to real property cannot include dominion over the destiny of persons the owner permits to come upon the premises. Indeed the needs of the occupants may be so imperative and their strength so weak, that the law will deny the occupants the power to contract away what is deemed essential to their health, welfare, or dignity. Here we are concerned with a highly disadvantaged segment of our society. . . . [M]igrant farmworkers . . . are unorganized and without economic or political power. It is their plight alone that summoned government to their aid.[347]

Locke, Kant, and Rawls would all find a great deal of common ground in the Court's analysis.

Indeed, in Professor Merrill and Smith's own writing, it is on the "infringement" side of property that they center their analysis.[348] By

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344. *See, e.g.*, ROBERT COOTER & THOMAS ULEN, LAW & ECONOMICS 154 (6th ed. 2012) ("The economic advantage of adverse possession is that it . . . allows property to move to higher-valuing users."); 16 RICHARD R. POWELL & PATRICK J. ROHAN, POWELL ON REAL PROPERTY § 91.01[4] (Michael Allan Wolf ed. 2014) (suggesting that "efficient allocation of our limited land resources" is one of the policies served by adverse possession).

345. *See Commonwealth v. Magadini*, 52 N.E.3d 1041 (Mass. 2016).

346. *See Ploof v. Putnam*, 71 A. 188 (Vt. 1908).

347. *See State v. Shack*, 227 A.2d 369 (N.J. 1971).

348. *See* Merrill & Smith, *supra* note 342, at 1870 (outlining "[t]he features we identify with morality-based decision making" as the doctrine and discourse governing "certain kinds of violations of property rights" and the "scope of protection for property rights").

way of contrast, consider a few data points from the "validity" side of traditional property: what things may be owned and how? A fundamental concept in modern property law is that of *numerus clausus*:

> Every common-law lawyer is schooled in the understanding that property rights exist in a fixed number of forms. . . . [I]t appears to be a universal feature of all modern property systems. In the common law, the principle that property rights must conform to certain standardized forms has no name. In the civil law, which recognizes the doctrine explicitly, it is called the *numerus clausus*—the number is closed.[349]

This principle has a clear utilitarian valence, between promoting efficiency through standardization[350] and dampening a tendency towards excessive anticommons.[351] In exchange, however, the principle directly shortchanges autonomy—in particular when (once again) compared to the enormous degree of freedom in contract law.

Consider, moreover, what might be the modern apogee of utilitarianism overriding moral intuitions of ownership, wherein eminent domain may be used to reassign land among private owners for the purposes of general economic development.[352] Or, less dramatically, consider how the careful avoidance of efficiency losses—not moral intuitions about ownership—dictates the proper disposition of partition disputes among co-tenants; partition in kind is the default (affording each tenant an actual piece of the parcel), unless doing so would negatively impact the total value, at which point the court will instead force a sale and split the revenue.[353] As noted earlier, adverse

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349. Thomas W. Merrill & Henry E. Smith, *Optimal Standardization in the Law of Property: The* Numerus Clausus *Principle*, 110 YALE L.J. 1, 4–5 (2000).

350. *See, e.g.*, *id.* at 8, 61–66 ("The existence of unusual property rights increases the cost of processing information about all property rights. . . . Standardization of property rights reduces these measurement costs.").

351. *See, e.g.*, Michael A. Heller, *The Boundaries of Private Property*, 108 YALE L.J. 1163, 1176–78 (1999).

352. *See Kelo v. City of New London*, 545 U.S. 469 (2005).

353. *See, e.g.*, *Butte Creek Island Ranch v. Crim*, 186 Cal. Rptr. 252, 256 (1982) ("[E]vidence which supports a partition sale rather than physical division is economic evidence to the effect that, due to the particular situation of the land, the division of the land would substantially diminish the value of each party's interest."); *Schnell v. Schnell*, 346 N.W.2d 713, 716 (N.D. 1984) (noting that partition in kind is preferred to partition by sale unless "the value of the share of each in case of a partition would be materially less than his share of the money equivalent that could probably be obtained from the whole"); *Cecola v. Ruley*, 12 S.W.3d 848, 855 (Tex. App. 2000) ("If the property can be divided in kind without materially impairing its value, a sale will not be ordered, [unless] dividing the land into parcels causes its value to be substantially less than its value when whole . . . .").

possession's similarly strong eye towards efficiency works—at least in theory—to transfer ownership to higher-valued uses. Even looking at some of the earliest American case law available on ownership is an exercise in utilitarianism; why does Pierson get the fox and not Post?[354] It is not the labor or will from Post's *pursuit* that the court found compelling, but—for the sake "of certainty" and to avoid "quarrels and litigation" in future cases—only Pierson's actual conquest and kill of the fox that mattered, "[h]owever uncourteous or unkind . . . towards Post."[355]

This is not to suggest that a perfectly identical, or even equally strong fault line necessarily exists in property law overall. Instead, it is argued that the broad and readily understood principles of property law appear to roughly break along lines parallel to those explored earlier in patent law. Patent law's *in rem* problem is, of course, only more severe. One can hypothetically infringe a patent without ever leaving the house, with the (unknown) patent owner half a world away, and with possibly no one to ever discover the transgression. Even *known* patents are notoriously challenging to ascertain the proper bounds of—far more so than the bounds of a modern, well-surveyed land parcel. If property law carried the genes of an enforcement regime animated by moral opprobrium, then little wonder that patent law maintained its expression.

C. A Private-Public Law Mix

Finally, it is worth noting that patents must straddle two somewhat disparate spheres—private law and public law. Patent infringement litigation is classically private, in the sense that it is a dispute between private parties about property rights.[356] But disputes over patent *validity* are more naturally classified as public, in the sense that it concerns government conduct and affects (potentially numerous) persons not before the court.[357] Government conduct is necessarily the focus of validity disputes, whether validity is challenged in the first instance by direct appeal from the PTO or after the fact (in post-grant PTO procedures or in district court litigation) as a claim that the PTO

354. *See Pierson v. Post*, 3 Cai. 175 (N.Y. Sup. Ct.1805).

355. *Id.* at 179.

356. *See, e.g.*, Adam Chayes, *The Role of the Judge in Public Law Litigation*, 89 HARV. L. REV. 1281, 1284 (1976) (discussing the features of private versus public law generally); Megan M. La Belle, *Patent Law as Public Law*, 20 GEO. MASON L. REV. 41, 41–42 (2012) (describing patent litigation over infringement claims as "historically" and properly "regarded as private law litigation"); Ted Sichelman, *Purging Patent Law of 'Private Law' Remedies*, 92 TEX. L. REV. 516 (2014) (labeling the current infringement and remedy structure for patents as "private law" in nature).

357. *See* Chayes, *supra* note 356, at 1284; La Belle, *supra* note 356, at 50–55.

granted in error. And whether the patent stands or falls affects, at minimum, the landscape for competitors and downstream consumers alike.

The Supreme Court appears to embrace this private-public mix, as emphasized most recently in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*.[358] Petitioner Oil States—who lost its patent in an inter partes review proceeding before the PTO—argued that patents, as "private property rights," can only be extinguished by an Article III court, not an Article I administrative tribunal such as the PTAB.[359] Respondent Greene's Energy—who had challenged Oil States's patent in the first place—argued that patents are "mere public rights," such that PTAB review and revocation presents no constitutional problem.[360] Ultimately, the Court held that post-grant invalidation by the PTO is not unconstitutional, justifying its decision as in line with the mixed private-public nature of patents:

> This Court has recognized, and the parties do not dispute, that the decision to *grant* a patent is a matter involving public rights . . . . Inter partes review is simply a reconsideration of that grant, and Congress has permissibly reserved the PTO's authority to conduct that reconsideration. Thus, the PTO can do so without violating Article III.
>
> . . .
>
> We emphasize the narrowness of our holding. . . . We do not address whether other patent matters, *such as infringement actions*, can be heard in a non-Article III forum. . . . Finally, our decision should not be misconstrued as suggesting that patents are not property for purposes of the Due Process Clause or the Takings Clause.[361]

Unpacking this last sentence, recall that the Takings Clause only protects "private property"[362]—and that the Court has long held (and recently reaffirmed) its application to patents.[363]

Even in the Court's view, then, patent law is fundamentally divided. Validity is a public matter, separate and apart from private

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358. *Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC*, 138 S. Ct. 1365, 1373–79 (2018).

359. Petition for a Writ of Certiorari at 2–4, *Oil States*, 138 S. Ct. 1365 (No. 16-712).

360. Brief in Opposition of Certiorari at 1–3, *Oil States*, 13 S. Ct. 1365 (No. 16-712).

361. *Oil States, LLC*, 138 S. Ct. at 1373–79 (second emphasis added).

362. U.S. CONST. amend. V.

363. *See, e.g.*, *Horne v. Dep't of Agric.*, 135 S. Ct. 2419, 2427 (2015) (citing *James v. Campbell*, 104 U.S. 356, 358 (1882)).

concerns with respect to infringement (including government infringement vis-à-vis takings). In *Oil States*, this allowed the Court to uphold the bifurcated adjudicatory structure already explored earlier. But the private-public division carries its own freight as well. As other scholars have observed, private law tends to reflect "moral rights that private parties are justified in enforcing in a state of nature."[364] Because private law is not "governance" in the strict sense, but rather "the empowerment of certain individuals to do things"—e.g., demand redress—it inevitably maintains some resonance with the moral intuitions of those individuals through the landscape of their own enforcement decisions.[365] In contrast, public law more readily carries out macro-level projects of complex social planning (including careful utilitarianism), as exemplified by the byzantine nature of tax codes or trade regulations.

Moreover, in the patent space in particular, it is worth emphasizing the differing *voluntariness* of engagement. On the public-validity side, a patent applicant affirmatively chooses to engage with the PTO; on the private-infringement side, a defendant is brought into court by force. The less intuitive, maximally utilitarian framework may thus be reserved for those who are willing to subject themselves to it from the bureaucracy, and who are hence more likely to understand the system (or afford the assistance of those who can). The more easily followed moral thread, in contrast, softens otherwise harsh edges when governing the conduct of potentially unwary citizens—who might simply stumble into an infringement dispute.

These three potential causes for the overall fault line in patent law—the parallel split in patent adjudicators, the intellectual inheritance from traditional property law, and the mixed nature of patents as both public and private law—are, to some extent, overlapping and interrelated. But the precise combination of all three is essentially unique to patent law, and suggests that the pattern of utilitarian dominance versus moral resilience is not mere path dependence, but rather a reflection of the gravitational pull of functionalist needs. Absent radical shifts to the institutional structure or overall conception of patent law, in other words, it seems highly unlikely that the fault line will lessen or close on its own.

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364. Andrew S. Gold, *A Moral Rights Theory of Private Law*, 52 WM. & MARY L. REV. 1873, 1899 (2011).

365. Benjamin C. Zipursky, *The Inner Morality of Private Law*, 58 AM. J. JURIS. 27, 40 (2013).

V. POLICY IMPLICATIONS: A TALE OF TWO REFORMS

Bearing these causes in mind, this article concludes with a brief look at policy effects and implications. Given the dichotomy established up to this point, reform efforts that are more readily cognized as "moral" or "economic" improvements may find greater traction acting upon infringement or validity law, respectively. Two paradigmatic examples follow: medical techniques and plant varieties.

The first rejections against medical technique patents came directly from the PTO, for reasons having little to do with morality. *Ex Parte Brinkerhoff* is the oft-cited exemplar, and is illustrative of the PTO's utilitarian reasoning.[366] In *Brinkerhoff*, the PTO Commissioner affirmed the examiner's rejection of an application to patent a medical procedure for treating piles, raising essentially two concerns: (1) the instruments needed to perform the procedure were already under patent by the same applicant, leading to a problem of double patenting; and (2) the technique, as opposed to the physical instruments, featured some uncertainty with respect to results, as the technique would not necessarily be effective on all patients.[367]

Regardless, by the 1950s the PTO had changed course and reversed *Brinkerhoff* explicitly,[368] allowing medical technique patents to issue without incident.[369] Judges, meanwhile, were more skeptical as to the *ethics* of such patents. As one district court judge opined at the time:

> Doctors and surgeons have seldom thought it desirable to try to patent their new procedures for human relief. . . . The grant of a patent carries with it the right to exclude others from its use for a period of seventeen years. The professional ethics of doctors and surgeons are more consistent with the widespread use of their medical and surgical discoveries for the benefit of mankind than in obtaining a monopoly to control their discoveries for persona commercial advantage.

366. *Ex Parte Brinkerhoff*, 24 MANUSCRIPT DECISION 349 (1883) *reprinted in New Decisions*, 27 J. PAT. OFF. SOC'Y 793, 797 (1945).

367. *Id.*; *see also Ex Parte Scherer*, 103 U.S.P.Q. 107 (B.P.A.I. 1954) (discussing *Ex Parte Brinkerhoff* in detail).

368. *Scherer*, 103 U.S.P.Q. at 110 ("To the extent *Ex Parte Brinkerhoff* holds or implies that all medical or surgical methods are unpatentable subject matter merely because they involve treating the human body, that decision is expressly overruled.").

369. *See* William D. Noonan, *Patenting Medical and Surgical Procedures*, 77 J. PAT. & TRADEMARK OFF. SOC'Y 651, 158–60 (1995) (listing representative patents up to 1993).

> In this respect it would seem also that public interest is here involved.[370]

The medical community itself seemed to agree. Prohibitions on medical technique patents could be found in the American Medical Association's very first Code of Ethics in 1847,[371] and little has changed in the intervening years.[372] By the 1980s, the AMA's opprobrium had only intensified: "The intentional withholding of new medical knowledge, skills, and techniques from colleagues for reasons of personal gain is detrimental to the medical profession and to society and is to be condemned."[373] On top of this condemnation, the challenges of actually enforcing such patents made applications relatively rare—physicians were not apt to discover what happened in closed operating rooms.[374] But as insurance companies, practice groups, and HMOs developed more sophisticated data-collection practices and records, enforcing technique patents became more plausible,[375] and applications began to climb by the 1990s.[376]

As these patents became more numerous and enforceable, a flashpoint was inevitable. In 1992, Dr. Samuel Pallin obtained a patent on a sutureless procedure for performing cataract surgery,[377] and his

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370. *Martin v. Wyeth, Inc.*, 96 F. Supp. 689, 695 (D. Md. 1951).

371. AM. MED. ASS'N, CODE OF MEDICAL ETHICS 10 (1847 ed.), http://resource.nlm.nih.gov/63310430R [https://perma.cc/LA7M-CRWX] (stating that such patents are "derogatory to professional character").

372. *See, e.g.*, *Organizational Section Proceedings of the New York Session*, 114 JAMA 2557, 2567 (1940), https://jamanetwork.com/journals/jama/article-abstract/1160620 [https://perma.cc/5YS7-TM2N] (finding it "unprofessional to receive remuneration from patents or copyrights on surgical techniques . . . or procedures").

373. AM. MED. ASS'N, CODE OF MEDICAL ETHICS, *Opinion 9.08 – New Medical Procedures* (1984), https://journalofethics.ama-assn.org/article/ama-code-medical-ethics-opinions-patenting-procedures-and-devices/2010-02 [https://perma.cc/JB7R-HGG6].

374. *See* Edward Felsenthal, *Medical Patents Trigger Debate Among Doctors*, WALL ST. J. at B1, B6 (Aug. 11, 1994) ("[Surgical technique patents] have been legal in the U.S. since the 1950s. But in the past, doctors rarely applied for them, in part because they can be extremely difficult to enforce."); Joel J. Garris, *The Case for Patenting Medical Procedures*, 22 AM. J.L. & MED. 85, 85 (1996).

375. *See* Wendy Yang, *Patent Policy and Medical Procedure Patents: The Case for Statutory Exclusion from Patentability*, 1 B.U. J. SCI. & TECH. L. 5, ¶ 29 (1995) ("[T]ransaction costs make these patents difficult and expensive to enforce. But changes in the structure of doctors' practices are making the use of procedures easier to monitor. Insurers, group practices, and health maintenance organizations . . . often have sophisticated systems for gathering data on procedures used by doctors . . . .").

376. Brett G. Alten, *Left to One's Devices: Congress Limits Patents on Medical Procedures*, 8 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 837, 838 (1998) ("But by 1996 it was estimated that as many as fifteen medical procedures were patented every week.").

377. *Method of Making Self-Sealing Episcleral Incision*, U.S. Patent No. 5,080,111 (issued Jan. 14, 1992).

attempts to seek royalties and enforce said patent through infringement suits against other physicians quickly became a rallying point for the broader medical community. The American Academy of Opthalmology was unequivocal: "Patents on medical procedures serve no purpose other than to enrich the person or organization that holds the patent."[378] The AMA reiterated its moral stance, labeling the practice "abhorrent."[379] General media coverage was no more favorable.[380]

Legislators offered their own condemnation,[381] and Congress was uncharacteristically quick to translate its umbrage into action, with multiple bills proposed to solve the moral quandary. Early versions would have eliminated patentability for medical techniques outright,[382] but these iterations faced significant pushback from the biotechnology and pharmaceutical industries, who feared that an overbroad exception to patentability would destroy their economic viability.[383] What ultimately succeeded was instead an exemption to *infringement*, pitched

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378. H. Dunbar Hoskins, Jr., *Doctors Group Opposes Medical Method Patents*, WALL ST. J., Sept. 6, 1994, at A13.

379. Sally Squires, *AMA Condemns Patents for Medical Procedures*, WASH. POST. (June 20, 1995), https://www.washingtonpost.com/archive/politics/1995/06/20/ama-condemns-patents-for-medical-procedures/b339653c-e4fa-4991-ad41-e762edc52b16/?noredirect=on&utm_term=.e62a35d907ca [https://perma.cc/BJ24-PZN5].

380. *See generally* Katherine J. Strandburg, *Legal but Unacceptable:* Pallin v. Singer *and Physician Patenting Norms* (NYU Law and Economics Research Paper No. 14-42), https://ssrn.com/abstract=2538557 (describing the full history and backlash associated with the Pallin patent).

381. *See Squires*, *supra* note 379 ("It really comes down to whether you want to call medicine a science or just a garden-variety business. . . . [W]hat you will have is a handful of physicians making vast sums of money while their patients and more other doctors pay through the nose.") (quoting Rep. Ron Wyden (D-Ore.)); *see also* 140 CONG. REC. E1754 (statement of Rep. Bryant); 142 CONG. REC. H8254, at H8276 (statement of Rep. Ganske) ("I trained in surgery with Dr. Joseph Murray of Boston who did the world's first successful kidney transplant. Dr. Murray did not run out and get a patent . . . . He would have thought this was against a fundamental tenet of medical ethics that admonishes the physician to teach and share freely medical advanced for the benefit of mankind.").

382. *See* H.R. 1127, 104th Cong. (1995) ("[A] patent may not be issues for any invention or discovery of a technique, method, or process for performing a surgical or medical procedure, administering a surgical or medical therapy, or making a medical diagnosis . . . ."); H.R. Rep. No. 104-879; H.R. 3814 § 619, 104th Cong. (1996) ("None of the funds made available in this Act may be used by the [PTO] to issue a patent . . . for any . . . technique, method, or process for performing a surgical procedure . . . .").

383. *See, e.g.*, *Medical Procedures Innovation and Affordability Act: Hearings on H.R. 1127 Before the Subcomm. on Courts and Intellectual Property of the House Comm. on the Judiciary*, 104th Cong. 61–62, 92 (1995) (statement of Mr. Baldino and statement of Dr. William Noonan); *see generally* Alten, *supra* note 376, at 862–70.

as a narrow ethical carveout that otherwise left the utilitarian incentive structure of patentability in place:

> Patents allow investors to recoup their investment and thereby encourage continuous innovation. Without the protection of patents, individuals and businesses would be reluctant to invest their time, money, and energy into developing new technologies. . . . The appropriateness and important of allowing patents for pharmaceuticals and medical devices is now well-established. . . .
>
> My legislation would prevent the enforcement of so-called pure medical procedure patents against health professionals. It would in no way, however, change patent law with respect to biotechnology, medical devices, drugs, or their methods of use. As a result, this narrowly tailored legislation would in no way discourage the important research being done in these areas of medicine. . . .
>
> [A]llowing pure procedure patents would undermine the medical community's tradition—and ethical duty—of freely exchanging information for the benefit of patients. As a surgeon, I know first hand that medical training involves a very important social contract . . . . Making improvements in surgical or medical care and sharing those innovations with others is a critical part of the medical profession's commitment to advancing its art. . . . Doctors have an ethical duty to seek the best care for their patients. This includes the duty to innovate when necessary.[384]

The legislation referred to above[385] was eventually folded into a larger appropriations bill[386] and passed with significant bipartisan support.[387] The end result: Section 287 of the Patent Act now features a safe harbor from infringement liability for any "medical practitioner's performance of a medical activity."[388]

Complex paper trail aside, the story above is readily comprehensible in light of the philosophical superstructure presented thus far. The boundaries of patent validity—as demarcated by a morally agnostic bureaucracy—creates an ethical quandary and backlash. Congress in turn, and guided by popular moral intuition, carves out an

384. 142 Cong. Rec. 26,825–26 (Sept. 30, 1996) (statement of Sen. Frist).

385. *See* S.2105, 104th Cong. (1996).

386. *See* H.R. 3610, 104th Cong. (1996).

387. Pub. L. No. 104-208, 110 Stat. 3009 (1996).

388. *Id.* (defining "medical activity" as "the performance of a medical or surgical procedure on a body"). For a full legislative history of the amendment, see Alten, *supra* note 376, at 861–83.

exception *to infringement*, but otherwise leaves validity unchanged.[389] These kinds of explicit, industry-specific carveouts are generally rare in the field of patent law overall,[390] but nevertheless instructive. In particular, the moral story of medical technique patents may be contrasted against a fundamentally economic story—that of plant patents.

Before 1930, plant species were generally thought to be ineligible for patent protection, for failing under either subject-matter eligibility or written description and enablement.[391] Regarding subject-matter eligibility, the nascent "product of nature" exception was thought to preempt plant patents outright.[392] Regarding written description, the subtle differences in plant variations seemed to defy an adequate level of specificity.[393] And enablement for plant patents was a recurring problem in the eyes of the PTO; whereas "descriptions and drawings in publications can often enable others to manufacture [a patented] article," without access to a patented plant itself, "one cannot deliberately produce a duplicate even though its ancestry and the techniques of cross-pollination be known."[394]

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389. As an aside, it is worth pointing out that this approach diverges from that of, say, the EU—where medical techniques are simply unpatentable. *See* European Patent Convention, Article 53(c) ("European patents shall not be granted in respect of . . . methods for treatment of the human or animal body by surgery or therapy and diagnostic methods . . . ."). Once again, this reifies the notion that other systems incorporate morality into patent law holistically, rather than on one-half of a fault line like the United States. *See supra* notes 7, 150–52 and accompanying text.

390. *See* Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1630–38 (2003) (collecting such instances, noting their rarity, and normatively arguing against further expansion).

391. *See Diamond v. Chakrabarty*, 447 U.S. 303, 311–12 (1980) ("Prior to 1930, two factors were thought to remove plants from patent protection. The first was the belief that plants, even those artificially bred, were products of nature for purposes of the patent law. . . . The second obstacle . . . was the fact that plants were thought not amenable to the 'written description requirement[,] . . . [b]ecause new plants may differ from old only in color or perfume . . . ."); Max Stul Oppenheimer, *The "Reasonable Plant" Test: When Progress Outruns the Constitution*, 9 MINN. J.L. SCI. & TECH. 417, 422–26 (2008) ("Prior to enactment of the [Plant Protection Act], it was commonly believed that the generally utility patent rules posed special problems when applied to plants.").

392. *See, e.g.*, *Chakrabarty*, 447 U.S. at 311; *J.E.M. Agric. Supply, Inc. v. Pioneer Hi-Bred Int'l., Inc.*, 534 U.S. 124, 134 (2001) ("[I]n 1930, Congress *believed* that plants were not patentable under § 101 . . . because they were living things . . . .").

393. *See Chakrabarty*, 447 U.S. at 312; Oppenheimer, *supra* note 391, at 424–25 (collecting examples of applicants' terminology, including "good flavor," "extreme hardiness," "firmness of flesh," and a color "between red and carmine").

394. *In re LeGrice*, 301 F.2d 929, 935 (C.C.P.A. 1962); *see also Dunn v. Ragin v. Carlile*, 50 U.S.P.Q. 472, 474 (B.P.A.I. Jan. 31, 1941) ("[T]he mere filing of an application for a patent for a new variety of plant would not enable anyone to reproduce such a plant.").

The end result of this patent ineligibility, policymakers believed, was clear economic loss in the form of reduced botanical innovation[395] and the proliferation of unsavory business practices.[396] These problems, only heightened by the state of the overall economy by 1930, spurred Congress to action in the form of the Plant Patent Act.[397] Between the Commissioner of Patents, the Secretary of Commerce, and the Secretary of Agriculture, the bureaucracy (along with numerous industry and commercial interest groups) was officially on board.[398] Committee reports described the measure as having "incalculable value in maintaining public health and prosperity, and in promoting public safety and the national defense."[399] The economic incentives of plant patents, they reasoned, "will mean better agricultural products that will give the public more actual value for its dollar."[400] The bill "had no organized opposition," and was quickly passed and signed into law.[401]

In terms of substance, the Plant Patent Act simply bent the rules for validity as needed to allow plants into the general fold. First, plants were added to patentable subject matter explicitly, thereby overriding any judicially created exception or gloss.[402] Second, written description

395. *See, e.g.*, H.R. REP. NO. 1129 (1930) ("To-day, plant breeding and research is dependent, in large part, upon Government funds to Government experiment stations, or the limited endeavours of the amateur breeder. It is hoped that the bill will afford a sound basis for investing capital in plant breeding and consequently stimulate plant development through private funds."); W.M. Hays, *Distributing Valuable New Varieties and Breeds*, Proceedings of the First Meeting of the American Breeders' Association held in St. Louis, Mo., at 62 (1905) ("Inventors who create new values, and creative breeders who add to the transmitting efficiency of plants and animals, are alike in that they too often do not secure for themselves reasonable remuneration. It is to the interest of the manufacturer, the grower of pedigreed seeds or pedigreed animals, and the general public that a liberal share of the new values go to the inventor and to the creative breeder.").

396. Cary Fowler, *The Plant Patent Act of 1930: A Sociological History of Its Creation*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 621 (2000) ("The long years of competing with farmer seed-saving and free government seed, coupled with a lack of scientific knowledge necessary to engage in effective formal breeding, had produced its share of dishonest practices and dishonest seedsmen and had weakened the entire industry.").

397. Townsend-Purnell Plant Patent Act, ch. 312, § 1, 46 Stat. 376 (1930) (codified as amended at 35 U.S.C. § 161 (2000)).

398. *See* Fowler, *supra* note 396, at 635–36 (describing institutional support for the Plant Patent Act).

399. H.R. REP. NO. 1129.

400. *Id*.

401. Fowler, *supra* note 396, at 640.

402. Plant Patent Act, 46 Stat. at 376 ("Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, . . . , *or who has invented or discovered and asexually reproduced any distinct and new variety of plant*, . . . may, . . . obtain a patent therefor.") (emphasis added); *see also* 15 U.S.C. § 161 (2019).

and enablement requirements were softened for plant patents in particular: "No plant patent shall be declared invalid on the ground of noncompliance with [35 U.S.C. § 112] if the description is made as complete as is reasonably possible."[403] The legislation has generally proved a success, with well over a thousand plant patent applications filed per year even today[404]—long after the Supreme Court stated that plants could receive traditional utility patent protection instead.[405] Even today—and for good or ill—the research of organizations ranging from German multinational corporations[406] to the University of California system[407] is funded on the backs of such patents.

Plant patents, then, tell a very different philosophical story than medical technique patents. Perceived limitations on patent law created an economic loss—the failure to incentivize plant research and creation. Industry members, Commerce, and the PTO itself all supported a fix. And the legislation that Congress does create bends the rules for *validity*, but does not appreciably change infringement. Again, these kinds of industry-specific changes are uncommon, but it is telling how history appears to rhyme. Access to affordable, generic pharmaceuticals is readily cognized as a moral issue—and the most significant patent law provision on that front is a safe harbor against infringement for their development and approval.[408] Today, much of patent law is seen as complex and uncertain ex ante, leading to potential economic inefficiencies; naturally, Congress is taking action on the validity side, starting with a clearer codification of § 101 to secure investment-backed expectations.[409]

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403. Plant Patent Act, 46 Stat. at 376; *see also* 15 U.S.C. § 162 (2019).

404. *See* USPTO, *U.S. Patent Statistics, Calendar Years 1963-2015*, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.pdf [https://perma.cc/4RRZ-DYMV].

405. *See Diamond v. Chakrabarty*, 447 U.S. 303, 311–12 (1980).

406. *See, e.g.*, U.S. Patent No. PP16,350 (Mar. 14, 2006) ("*Sedum* Plant Named 'Garbro'").

407. *See, e.g.*, U.S. Patent No. PP22,589 (Mar. 20, 2012) ("Strawberry Plant Named 'Mojave'").

408. *See* 35 U.S.C. § 271(e)(1) (Hatch-Waxman Act safe harbor provision).

409. On April 17, Senators Tillis (R-NC) and Coons (D-DE), along with Representatives Collins (R-GA), Johnson (D-GA), and Stivers (R-OH) released a draft of reforms to § 101 of the patent statute—the provision governing subject-matter eligibility—citing, among other reasons, the complexities and "uncertainties in . . . this area of patent law jurisprudence." *Sens. Coons and Tillis and Reps. Collins, Johnson, and Stivers Release Section 101 Patent Reform Framework* (Apr. 17, 2019), https://www.coons.senate.gov/newsroom/press-releases/sens-coons-and-tillis-and-reps-collins-johnson-and-stivers-release-section-101-patent-reform-framework [https://perma.cc/WL5K-QQAT]; *see also Draft Outline of Section 101 Reform*, https://www.tillis.senate.gov/services/files/3491a23f-09c3-4f4a-9a93-71292704c5b1 [https://perma.cc/54Q9-K2QD].

This is not to suggest that it is impossible to achieve morally driven changes within the law governing validity, or solely economics-focused improvements within the law governing infringement. It is a suggestion that, for the reasons outlined throughout this article, there is some degree of polarity in the world of patents—and its pull may influence the weight given to efforts at reform. The fault line described thus far resonates at all levels, from the judiciary to the administration, from Congress to the general public. To those with particular projects or goals for patent law, one half of the law may therefore offer decidedly less resistance than the other.

CONCLUSION

The dominance of utilitarian-focused patent scholarship and comparative marginalization of moral theory has been, it seems, somewhat myopic. Although the law governing patent validity—from novelty to enablement—has, in truth, been strongly and primarily infused with utilitarian reasoning, the law governing patent infringement tells a different story. The contours of that doctrine, ranging from damages to defenses, retain a significant level of influence from freestanding moral theories—and even, at times, exhibit an outright hostility to prioritizing efficiency over other values. This fault line has several interrelated causes, predicated on the unique legal position of patents today: a stark divide in adjudication between traditional courts and administrative tribunals, the deep influence of traditional property law, and the mix of public-law and private-law features that patents exhibit. Advocates for functional changes in the patent system—whether based on morality or economic concerns—would be well-served to acknowledge this gravitational pull in the field. If their efforts are focused on the wrong doctrinal half of patent law, they may find themselves in a surprisingly uphill battle.