A Nonvolitional Conduct Exemption to Strict Liability for Patent Infringement, or the Problem of *Insufficient* Thought Control

Kevin Emerson Collins[*]

This article argues that strict liability in patent law should be less strict than it currently is. It argues that something similar to the nonvolitional conduct exemption that exists in other legal doctrines premised on strict liability should be imported into patent law. Specifically, it argues in favor of a *constructive-nonvolition* exemption. Unlike conventional notions of nonvolition, constructive nonvolition does not turn solely on the defendant's physiological control over his body. Constructive nonvolition instead identifies the circumstances under which the defendant exercised insufficient control over his actions to justify patent liability. In particular, it focuses on the cost that a defendant must incur in order to either avoid infringing a patent or reduce the benefit that he receives from using the patented technology. If the defendant's choice set is constrained in a way that makes an obligation to avoid use of or benefit from the technology both inefficient and unfair, the defendant's use is constructively nonvolitional, and the defendant should qualify for an exemption from strict liability for patent infringement. To illustrate the impact that such an exemption would have in contemporary patent practice, this article addresses recent the Federal Circuit opinions in *SmithKline Beecham Corp. v. Apotex* and *Monsanto Canada Inc. v. Schmeiser* and explores how the opinions would have been altered if a constructive nonvolition exemption from strict liability had been considered.

This article also brings the newly minted concept of constructive nonvolition to bear on claims that recite inventive, reflexive acts of thinking. The patent claim that was recently at issue before the Supreme Court in *Laboratory Corp. v. Metabolite Laboratories* demonstrates that the PTO allows inventors to propertize simple acts of human reasoning that the public of thinkers cannot control. This article argues that the patentee in *Laboratory Corp.* was the beneficiary of economically and constitutionally overbroad patent protection because the lower courts failed to implement a constructive-nonvolition exemption from strict liability for patent infringement.

[*] Associate Professor of Law, Indiana Law.

A Nonvolitional Conduct Exemption to Strict Liability for Patent Infringement, or the Problem of *Insufficient* Thought Control

Kevin Emerson Collins*

INTRODUCTION

* Associate Professor of Law, Indiana Law. For their insightful comments on various drafts of my larger project addressing the propertization of thought, I want to thank Mark Lemley, Peggy Radin, the attendees of faculty workshops at University of Illinois School of Law and Cardozo Law School, the Intellectual Property Scholars Conference at the UC Berkeley School of Law, the Jurisgenesis Conference at Washington University in St. Louis (John Applegate, Jim Chen, Jeffrey Rachlinkski and Ellen Sward in particular), and the Law and Society Workshop at Indiana Law. All errors and imperfections are, of course, mine and mine alone.

Researchers regularly discover unexpected correlations. For example, here is an entry in the "Who knew?" annals of medicine: Gum disease is a risk factor that can be used to identify and predict cardiovascular disease.[1] Perhaps even more unexpected than these correlations themselves, however, is the patent protection currently available for the researchers who discover them. Here is the corresponding entry in the "What if?" annals of patent law: Had the researchers who first discovered the correlation between gum disease and cardiovascular disease been patent savvy, they could have claimed a useful and nonobvious method of assessing cardiovascular health. They could have sought a patent claim to—and thus rights to exclude others from—performing the following two acts in succession: (a) examining a patient's gums and (b) correlating the presence (or absence) of gum disease with an increased (or not-increased) risk of cardiovascular disease.

Paradoxically, these hypothetical patent rights are troubling because of a confluence of distinct concerns about excessive legal control over thought and insufficient willful control over it. On the one hand, a claim like the one in the above hypothetical *propertizes thought*. It sanctions a form of private, negative thought control: it grants a patentee a legal right to exclude others from performing an act of thinking because the patentee performed the act of thinking first.[2] The propertization of thought may seem to take the property generated by the patent regime too far; it may be viewed as creating a problem of excessive legal control over human thought. On the other hand, however, the hypothetical claim is particularly troubling even in relation to other thought-

[1] *See, e.g.*, Robert Genco et al., *Periodontal Disease and Cardiovascular Disease: Epidemiology and Possible Mechanisms*, 133 J. AM. DENTAL ASS'N, June 2002, at 14S.
[2] *See* Kevin Emerson Collins, *Propertizing Thought*, at Section I [hereinafter *Propertizing Thought I*] (defining the propertization of thought) (draft available on SSRN).

propertizing claims because potential infringers exercise insufficient capacity to control their own thoughts and to avoid performing the claimed method. Like the act of correlating recited above, many acts of reasoning are reflexive or involuntary.[3] When we say that our minds jump to logical conclusions, we do not understand the process to involve one part of our minds—our wills—instructing another part to jump. When combined with the fact that patent infringement is a "strict liability" cause of action,[4] the reflexive nature of a claimed act of thinking stirs up trouble for the law-abiding public who wants to avoid patent infringement. Whether a defendant is "innocent" and whether he did not intend to perform the claimed method are legally irrelevant;[5] defendants who perform the steps of a claimed method are almost always held *per se* liable for patent infringement.[6] If strict liability is strictly construed in this fashion, the only way that a dentist can avoid performing the method claim described above is to avoid looking inside of a patient's mouth. The dentist cannot help but perform the reflexive correlating step if he sees his patient's gums and has read about the link between gum and heart disease. In

[3] To follow standard patent law terminology, this article refers to mental processes as "acts" despite the fact that action is sometimes defined in opposition to thought. It also refers to both "reflexive acts" and "involuntary acts" despite the fact that the concept of an act is sometimes defined so as to presume voluntariness. *See* H.L.A. HART, PUNISHMENT & RESPONSIBILITY 98 (1968) (quoting Austin's Lecture XVIII); OLIVER WENDELL HOLMES, JR., THE COMMON LAW 54 (1946).

[4] Jurgens v. CBK, Ltd., 80 F.3d 1566, 1570 n.2 (Fed. Cir. 1996).

[5] Florida Prepaid Postsecondary Educ. Expense Bd. v. College Savings Bank, 527 U.S. 627, 654 n.5 (1999) ("[I]nfringement may be entirely inadvertent and unintentional and without knowledge of the patent."); Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 27, 35 (1997) (neither the doctrine of equivalents nor literal infringement requires a showing of intent to infringe); Mitchell v. Hawley, 83 U.S. (16 Wall.) 544, 550 (1872) ("innocent" infringement is still infringement). Knowledge of a patent and intent to infringe do not provide a defense to patent infringement but they may affect the availability of damages, 35 U.S.C. § 287(a) (2000) (marking and notice requirements); the amount of damages available, *id.* § 284 (treble damages in some cases of willful infringement), and the existence of contributory infringement, *id.* § 271(c) (requiring knowledge of the patent for contributory infringement). *Cf.* Roger D. Blair & Thomas F. Cotter, *Strict Liability and Its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799 (2002) (arguing that patent infringement works on a modified strict liability regime).

[6] *But see* Madey v. Duke, 307 F.3d 1351, 1362 (2002) (discussing the experimental use exception to strict liability for uses that are "solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry"); Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1581 (Fed. Cir. 1991).

sum, the claim is potentially troubling not merely because it is a thought-propertizing claim, but also because it is a *reflexive* thought-propertizing claim.

Reflexive thought-propertizing claims that follow the basic template of the gum-disease hypothetical are not unknown in the contemporary patent regime. The PTO routinely issues "test and correlate" patent claims,[7] and the Supreme Court was even cued up last term to address the validity of such a claim in *Laboratory Corp. v. Metabolite Laboratories* before the Court dismissed the writ of certiorari as improvidently granted after oral argument.[8] Like the gum-disease hypothetical, the claim at issue in *Laboratory Corp.* was premised on the discovery of an unexpected medical correlation: a high level of one chemical, the protein homocysteine, in a patient's blood corresponds to a deficiency of a second chemical, Vitamin B12.[9] Continuing the parallel, the *Laboratory Corp.* claim recited a two-step method of diagnosing a Vitamin B12 deficiency: (a) testing a patient's homocysteine level and (b) correlating the presence (or absence) of an elevated level of homocysteine with the presence (or absence) of a Vitamin B12 deficiency. Doctors faced with the *Laboratory Corp.* claim therefore faced a plight similar to the dentists' plight. Prior to the discovery of the correlation, homocysteine tests were in the public domain. After the discovery, however, all doctors who ordered homocysteine tests performed the claimed method because knowledge of the homocysteine/Vitamin B12 correlation was widespread and no doctor could avoid performing the inventive, reflexive act of correlating after having viewed the results of a

[7] *See infra* note 131 (discussing "test and correlate" claims).
[8] 126 S. Ct. 2921 (2006) (dismissing the writ of certiorari as improvidently granted).
[9] To minimize technical jargon, this description significantly simplifies the correlation. For a more precise description of the correlation, see *infra* note 87.

homocysteine test. If strict liability is strictly construed, a doctor must avoid ordering a homocysteine test in order to avoid performing the claimed method.

Bracketing the important normative question that queries whether patent law should ever sanction the propertization of thought, this article focuses on the particular problems created when a patent claim recites a reflexive act of thinking over which a thinker exercises insufficient control.[10] It narrows the focus in this fashion, however, to make a much broader point. Rather than making subject-matter specific exceptions to doctrines of general applicability to deal with reflexive thought-propertizing claims that are arguably at the periphery of the traditional realm of patent protection, it instead uses the problems that surface at the periphery to understand and redefine the center. It argues that strict liability in patent law should never mean absolute liability for using a technology covered by a valid patent claim. It proposes and defends a *constructive-nonvolition* exemption to patent infringement that reduces the strictness of strict liability in all patent cases, including those in which the defendant's immediate technology-using act is deliberate rather than involuntary. Constructive nonvolition is not derived from the conventional definition of a nonvolitional act in criminal law or trespass.[11] It allows a court to identify the situations in which the defendant's control over his use of a patented technology is insufficient to justify the imposition of liability under the patent laws

[10] This article therefore does not address whether claims that propertize thought should be patentable subject matter under of Section 101 of the Patent Act. *Cf.* Collins, *Propertizing Thought I*, *supra* note 2, at Section III (considering two doctrinal approaches to assessing the patentability of thought-propertizing claims under Section 101); Kevin Emerson Collins, *Propertizing Thought: Two Notions of Infrastructure* (work in progress) [hereinafter *Propertizing Thought III*] (exploring the normative problems attendant to the propertization of deliberate thought). To explore constructive nonvolition and explain one reason why *Laboratory Corp.* was a difficult case for the Supreme Court to decide, this article assumes that thought-propertizing claims, or at least those resembling the *Laboratory Corp.* claim, recite patentable subject matter.

[11] *See infra* text accompanying notes 70-77 (presenting the traditional nonvolitional act exception to strict liability in criminal law and trespass).

because his choice set was unduly restricted. More specifically, it focuses on the cost that the hypothetical defendant who wants to respect patent rights must incur in order to avoid infringement or reduce the benefit that he receives from the patented technology. If in order to reduce that benefit a defendant must abandon privileges that he enjoys in either the prior art or more broadly a possible world in which the patented technology is never invented, then constructive nonvolition exists and the defendant should not be strictly liable.

Critically, constructive nonvolition does not presume an invalid or impermissibly overbroad patent claim. Patent law's invalidity doctrines prohibit claims that literally encompass more technology than an inventor has actually invented, and these invalidity doctrines are conventionally presumed to be the only bulwark that is required to avoid patent damages that over-reward an inventor and that unfairly or inefficiently tax the public. The concept of constructive nonvolition as an exemption from strict liability challenges the sufficiency of this bulwark. Constructive nonvolition does not raise the problem of too many embodiments of a technology being included within the descriptive figure of a patent claim. It is rather the problem of too few non-infringing options remaining for a particular defendant in the not-described ground outside of that figure.

To demonstrate that constructive nonvolition is a concept of general applicability in patent law, Section I initially explains it without any reference to reflexive thought-propertizing claims. The remainder of this article then brings the newly minted concept to bear on reflexive thought-propertizing claims. Section II sets the table. It introduces the idea of a thought-propertizing claim and highlights why such a claim occupies an uncomfortable position within the overall structure of patent law. It then illustrates the

reflexive nature of some acts of thinking and argues that reflexive thought-propertizing claims raise the same problem of constructive nonvolition that exists in all of patent law, but that they do so in spades. Section III focuses specifically on patent infringement cases involving reflexive thought-propertizing claims that follow the template of the *Laboratory Corp.* claim. It demonstrates that courts afford patentees protection that is both economically and constitutionally overbroad when they equate strict liability with absolute liability, but not when they recognize a constructive-nonvolition exemption from strict liability.

I. STRICT LIABILITY AND CONSTRUCTIVE-NONVOLITION

Although they have yet to do so, courts should recognize a general, constructive-nonvolition exemption from strict liability for patent infringement. The first part of this section identifies two principles that animate most normative justifications of patent law. The second part argues that strict liability for patent infringement can violate both of these principles if it is strictly construed but not if the courts recognize a constructive-nonvolition exemption.

A. Two Minimalist, Consensus Principles of Patent Policy

Two basic principles form a backstop for the justifiable extent of patent protection. The reward principle holds that the inventor's reward must remain proportional to the welfare benefit attributable to the technology that the inventor actually invented. The baseline principle is the logical, negative corollary of the reward principle: the public should not be made worse off by the development of a technology and its patenting than it would have been had the invention never been introduced to the world at all.

These two principles identify a normative least-common denominator. Crafted in response to both efficiency- and fairness-oriented justifications of patent law, they describe characteristics shared by most visions of what patent protection should be (provided, of course, that patent protection should exist at all).[12] They strategically sacrifice detail and bite to achieve a minimalist consensus, so they do not purport to provide criteria sufficient to ensure a normatively justifiable patent regime.[13]

1. The Reward Principle

The reward principle limits the size of the reward that the patentee can reap: the patentee's reward may derive only from the marginal increase in social welfare that is attributable to the existence in the world of technology that the patentee actually invented. Patents hold out the possibility of a financial reward as a carrot to lure potential inventors into inventive pursuits,[14] but the objective of patent law is not simply to compensate all those who engage in inventive activity. The patent regime is a meritocracy: only successful inventors receive a reward. Furthermore, it is the market

[12] This article does not consider *ex post* efficiency justifications of patent law. *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. LAW & ECON. 265 (1977) (elaborating a prospect theory of patent law). *See generally* Mark A. Lemley, *Ex Ante versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129 (2004) (differentiating *ex ante* from *ex post* justifications).

[13] A consensus position is adopted because a more restrictive, controversial position is not required. *See infra* notes 46-78 and accompanying text (demonstrating that contemporary patent protection can violate even these consensus principles if strict liability is strictly construed).

[14] The incentive-to-invent justification of patent law presumes that self-interested actors will inefficiently under-invest in the generation of inventive information if there is no patent regime. Inventive information is a public good: it is nonrival (the marginal cost of providing it to another consumer is zero, or at least close thereto) and nonexclusive (others cannot be excluded from consuming it). ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 673 (4th ed. 1998). The potential inventor knows that potential competitors will learn about his inventive information from any goods that embody it. (If the goods produced by an invention are non-informing in that they do not teach the public about the invention, then patent law often relies on an incentive-to-disclose rather than an incentive-to-invent justification.) The potential inventor expects that potential competitors will drive goods that embody the invention down to their marginal cost of production. Anticipating his inability to recoup his sunk costs of invention, the potential inventor therefore chooses not to become an actual inventor. With patent protection, in contrast, inventive information remains nonrival but it becomes exclusive in a limited fashion. Inventors expect to be able to exclude others from making, using or selling at least some of the inventive goods, and they expect to internalize some of the value that the public derives from their inventive information.

that measures the existence and extent of success: rewards are measured by marginal costs of production and consumers' willingness to pay.[15] The costs that even successful inventors (at least successful in the sense that they receive patents and exercise some monopoly power) sink into inventive activities may not be fully recouped if the invention's supply-side efficiencies are too small or consumers' willingness to pay for the invention is insufficiently strong.[16] To allow the market to measure success, it is critical that a patentee's reward is never driven by a market for technology that the patentee did not actually invent.[17]

Both efficiency- and fairness-oriented worldviews provide normative justifications of the reward principle as a limit beyond which a patentee's profit should not extend. The efficiency ramifications of the reward principle are twofold. First, the reward principle helps to limit the reward to what is needed to provide an efficient incentive to invent. Too much patent protection has the same potential to be harmful that too little does,[18] and an inventor who can profit from technology that he did invent is more likely to be over-rewarded than an inventor who cannot. Second, the reward principle permits patent rights to provide feedback to inventors about the consumers'

[15] An incentive system need not measure success by willingness to pay. A prize system could measure success based on the quantum of technological advance as assessed by experts. *Cf.* Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115, 127-70 (2003) (discussing four prize systems). The government could also reward technological contributions based on utility gains not reflected by willingness to pay, e.g. it could reward vaccines for diseases prevalent only in underdeveloped countries.

[16] *See* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 300 (2003) (noting the lack of any relationship between costs of and reward for invention under the patent regime).

[17] The reward principle only stakes out an outer limit: the patentee's reward should never derive from technology that he did not actually invent. It does not establish an entitlement on the part of the patentee to all of the value that his inventive information generates. *See infra* note 33 and accompanying text (emphasizing the role of welfare spillovers from invention in patent law).

[18] *See* LANDES & POSNER, *supra* note 16, at 21-24 (discussing the basic cost-benefit tradeoffs of intellectual property); Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1058-65 (2005) [hereinafter *Free Riding*] (addressing the problems that arise from overcompensating inventors).

desires.[19] If a patentee's reward is not proportional to consumers' willingness to pay, then inventors and investors will not receive the proper signals and will not be channeled into the areas that produce the greatest welfare benefits.[20]

The reward principle also furthers a basic fairness concern. Filtering out his utilitarian overtones, John Locke famously postulated that a person can generate a moral claim to property in the state of nature by mixing his labor with the raw materials of the commons.[21] Simply described, if I clear a field in the plenteous woods and cultivate a crop of wheat, both the land and the wheat become my property because I have property in my body that, through labor, extends to the valuable goods that I produce. This story of the body has been recast as a story of the mind to produce a labor theory of patents: I have property in my mental faculties, so I have property in the inventive ideas that I reap from the vaguely Platonic "field of ideas" after I have labored with my mental faculties to cultivate that "field".[22] The normative strength of a labor-theory justification that supports either contemporary patent law or any doctrinal variant of patent law at all has been repeatedly challenged,[23] and it is not the purpose of this brief discussion to defend a labor-theory justification of patent rights on the merits. Rather, the purpose is to

---

[19] *See* William Fisher, *Theories of Intellectual Property*, *in* NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY 168, 178-79 (Steven R. Munzer, ed. 2001) (discussing a utilitarian theory of intellectual property based on optimizing patterns of productivity).

[20] Inventors do not need to internalize all of the benefit created by their inventions. The argument made here is only an intra-patent argument: inventors' proportionate shares of the benefits should be roughly equal in different areas of technology.

[21] JOHN LOCKE, TWO TREATISES OF GOVERNMENT, SECOND TREATISE, at ch. 5 (Peter Laslet ed. 1953). *See also* JEREMY WALDRON, THE RIGHT TO PRIVATE PROPERTY 137-252 (1988) (presenting Locke's theory of property).

[22] Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 315 (1988). For an overview and comparison of the wide variety of different Lockean interpretations of intellectual property that have been proposed, see Fisher, *supra* note 19, at 184-89.

[23] *See, e.g.*, Seanna Valentine Schiffrin, *Lockean Arguments for Private Intellectual Property*, *in* NEW ESSAYS IN THE LEGAL AND POLITICAL THEORY OF PROPERTY 138, 159-66 (Stephen R. Munzer, ed., 2001) (questioning a Lockean justification of intellectual property under any of three different characterizations of the initial commons); Tom G. Palmer, *Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects*, 13 HARV. J.L. & PUB. POL'Y 817 (1990).

reinforce the importance of respect for the reward principle as a limit. Assuming that a labor theory of property has some normative force, it clearly cannot sanction a patent regime that grants an inventor control over technology that he did not actually invent.

2. The Baseline Principle

The baseline principle establishes a set of privileges that a justifiable patent regime cannot take away from the public: the public's privileges should be made smaller by a patent than they would have been if the patented invention had never been discovered, at least if the costs of administering the patent regime are overlooked. The baseline is simply the flip side of the reward principle. Where the reward principle is phrased in terms of a limit on the rights of a patentee, the baseline principle describes a minimum set of privileges that must be reserved for the public.

Because the drawing of this baseline involves counterfactual reasoning—What would the world be like if the patented invention had never been discovered?—the rhetoric of *possible worlds* offers a concise way to discuss it.[24] The baseline can be measured by invoking a *possible world* that is different from our own *actual world* in that the inventive technology does not exist but that is as close as is possible to the actual world in all other respects.[25] This article refers to the baseline possible world as Possible

[24] *See* DAVID LEWIS, ON THE PLURALITY OF POSSIBLE WORLDS 20-27 (1986) (exploring the rhetorical use of possible worlds in counterfactual thinking). The existence and nature of possible worlds is a subject of considerable debate in philosophical and linguistic circles. This article only adopts the rhetoric of possible worlds as a way to talk about counterfactual reasoning; its arguments do not take a side in the philosophical debate.

[25] The "actual world" is a term of art in possible-world discourse. In a "realist" understanding of possible worlds, the "actual world" is merely one of the many, many possible worlds, just one that "is special, closer to our hearts and distinguished somehow from the others that are 'merely' possible." JOHN DIVERS, POSSIBLE WORLDS 5 (2002) (structuring possible-world discourse around a debate between realist and antirealist camps). Closeness, too, is a possible-worlds term of art. LEWIS, *supra* note 24, at 21. As soon as we leave the actual world by making one change, we open a Pandora's Box of other possible changes. *Id.* (arguing that in a possible world in which "kangaroos have no tails" it is necessary to understand why we don't assume "gratuitous departures from the background of fact" and assume as well that "kangaroos float around like balloons"). The idea of closeness tethers PW1 to the actual world in every way that does

World 1 ("PW1") and the contents of PW1 as "PW1 technologies". The baseline principle holds that the public's privileges in the actual world with a patented technology cannot be diminished with respect to the privileges that the public possesses in PW1 where the technology itself does not exist. In other words, patents cannot restrict access to PW1 technologies.

In gross, two groups of technology are represented in PW1. PW1 contains the technologies that are *prior art* with respect to the patented invention—those technologies that were in existence before the discovery of the patentable invention.[26] Because patent law relies on the prior art in its day-to-day operation, the identification of the prior art is unlikely to create many administrative problems for the generation of PW1. PW1, however, contains more than prior art technology. Because it is defined at a particular historical date, the prior art is static. In contrast, PW1 grows during the term of a patent. Although PW1 lacks the patented invention and its improvements, technological progress in PW1 does not come grinding to a halt. PW1 still contains all technologies that are unrelated to the patented technology and are discovered in PW1 despite the absence of the patented technology.[27] Much more so than the prior art, the category of post-invention-yet-unrelated technologies is open to a host of line-drawing controversies at the

---

not seem dependent on the existence of the patented technology. *Cf. infra* note 28 (discussing the line-drawing problems inherent in identifying the contents of PW1).

[26] The prior art consists of technologies that were actually in existence prior to the date of the invention, 35 U.S.C. §§ 102(a), (e) & (g) (2000) (novelty), and technologies that were only constructively in existence, *id.* § 103 (nonobviousness). For the sake of simplicity, this article equates the prior art with the technology that existed prior to the discovery of a patentable invention and disregards the prior art created by the statutory bars. *See id.* § 102(b), (d) (describing statutory bars that generate prior art with respect to dates of filing rather than dates of invention).

[27] Many constructive nonvolition cases can be resolved by assuming that only the prior art is in PW1, but other cases will require that PW1 incorporate post-invention technology. *See infra* notes 58 & 150 (discussing the importance of PW1 art that is not the prior art to constructive nonvolition).

margin.[28] Thankfully, however, these questions at the margin do not need to be addressed in the vast majority of cases. What is important is that PW1 contains both the prior art and at least a set of intuitively identifiable, post-invention technologies that are clearly unrelated to the subject matter of the patent. For example, if I invent a glass-sided toaster so you can tell how brown your toast is before you pop it out of the toaster, both prior-art toasters and other post-invention technologies such as wrist-TVs, software and genes are clearly unrelated to the glass-sided toaster and are therefore PW1 technologies.

Not surprisingly, the normative justifications of the baseline principle mirror those discussed in reference to the reward principle.[29] If a patentee is able to control access to technology that exists in PW1, then consumers will inefficiently underutilize that technology from a short-run, static-efficiency perspective, yet it is reasonable to be more skeptical about the existence of long-run, dynamic-efficiency gains.[30] From a fairness perspective, patents should not take something away from the public that the inventor cannot make a colorable claim to have produced through his labor. Patent rights

[28] The question required to define this category with precision is a counterfactual of immense complexity: Over the term of a patent, how does the set of technologies extant in a possible world in which the patented invention does not exist diverge from the set we enjoy in actual world? For example, if the discovery of actual technology A highlighted the consumer demand for competing, actual technologies B and C but did not provide any technological advance required to produce them, are B and C present in the PW1 defined by the absence of A? *Cf. infra* notes 194-197 and accompanying text (discussing the difficulty in *Laboratory Corp.* of determining whether the contemporary act of assessing a patient's vascular health based on the data produced by a homocysteine test exists in PW1).

[29] *See supra* text accompanying notes 18-23 (outlining the normative justifications of the reward principle).

[30] A patent system that does not respect the reward principle would raise significant antitrust concerns. One fact that mitigates the conflict between patent rights and antitrust law is that successful inventions are presumed not to harm buyers in the markets for goods that were available prior to the discovery of the patented invention. 10 PHILLIP E. AREEDA ET AL., ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION, pt.3, ch.17G-2, ¶ 1780a. *But see id.* at n.7 (noting that a patentable improvement invention may affect the price of PW1 technologies in the actual world because it may reduce demand for a prior art good to a point that is below a minimum efficient scale).

that violate the baseline principle are a form of unfair compulsion or bullying of the public.[31]

3. The Principles' Intended Limitations

The reward and baseline principles are extremely modest propositions. They have limited bite, and they are satisfied by a broad array of patent regimes. Because it is critical to understand what these principles are not in order to understand what they are, three limitations that mitigate the practical impact of these principles are discussed below.

First, the reward principle does not prevent inefficient overprotection of inventive information. It is entirely possible that all patent regimes are inefficient, so restrictions on the nature of patent protection categorically cannot guarantee efficiency.[32] Furthermore, it is widely believed that the reward principle should not be the *only* limit on a patentee's reward and that an inventor should not be able to internalize the entire welfare benefit attributable to the presence of his invention in the world. The patent regime has positive externalities and spillovers vis-à-vis the inventor built into its very core.[33] Efficient rewards should be proportional, not equal, to the welfare benefit

---

[31] Wendy J. Gordon, *Of Harms and Benefits: Torts, Restitution and Intellectual Property*, 21 J. LEGAL. STUD. 449, 478 (1992) [hereinafter *Harms & Benefits*] (discussing "fair compulsion" in intellectual property).

[32] The public is worse off in the actual world with a patented technology priced above its marginal cost of production than it is in a possible world with the same technology without patent protection. *But see supra* note **Error! Bookmark not defined.** (noting the possibility of using *ex post* efficiency justifications for patent law). The extent to which this fact forms the basis of a convincing indictment of the patent regime, however, depends on the extent to which the technological contents of the actual world would still exist if patent protection were to be eliminated.

[33] Lemley, *Free Riding*, *supra* note 18, at 1046-69 (defending the efficiency-enhancing role of free riding in intellectual property law). The spillovers take several forms. In part, they can be traced to the disclosure requirements. LANDES & POSNER, *supra* note 16, at 288-89 (discussing the "incomplete appropriability" in patent law that results from the disclosure requirements). In part, they derive from blocking patents on improvements. Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1000-13 (1996) (discussing how blocking patents reduce the benefit of an invention that a patentee can internalize). Even the limited duration of patent rights can be viewed as a spillover-producing

attributable to the technology actually invented by the inventor.[34] The reward principle merely marks an outer extremity of patent protection that should under no circumstances be surpassed.

Second, the baseline principle disregards entirely the costs of administering the patent regime. When these costs are considered, many defendants in patent cases may be worse off in the actual world than they are in PW1. Because the boundaries of patent rights are often fuzzy,[35] some defendants will endure the costs of litigation in the actual world when they are in fact non-infringing practitioners of PW1 technology. Because patent searches are costly, there will also be innocent infringers[36] who subjectively devalue the benefit vis-à-vis traditional patent-law remedies.[37] Innocent infringers may use a technology because they derive enough value from it to merit paying a competitive price, but they may not value it enough to pay that cost plus the patentee's supra-competitive asking price. When the costs of the uncertainty that results from laborious patent searches and fuzzy boundaries are taken into consideration, innocent infringers may be worse off in the actual world than they are in PW1.

Third, neither the reward nor the baseline principle places any restriction on how patent protection deals with the independent invention of a patented technology. Under

---

provision. *See* 35 U.S.C. § 154(a)(2) (2000). A property-maximalist regime without spillovers is almost unimaginable. *Cf.* R. Polk Wagner, *Information Wants to Be Free: Intellectual Property and the Mythologies of Control*, 103 COLUM. L. REV. 995 (2003) (illustrating that even a self-styled maximalist perspective of intellectual property presumes that patented inventions have positive externalities).

[34] Rewards that are smaller than the full quantum of the welfare benefit produced by the existence of an invention in the world can also be justified on fairness grounds. *See* Gordon, *Harms & Benefits*, *supra* note 31, at 478-479 (noting that rights of recovery should be limited to what is necessary to recoup the value added).

[35] *Cf.* Kimberly A. Moore, Markman *Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231 (2005) (discussing the growing reversal rate of claim construction rulings by the Federal Circuit).

[36] *See supra* note 5 (discussing innocent infringement).

[37] *See* 35 U.S.C. § 284 (2000) (linking monetary remedies to a reasonable royalty or the patentee's lost profits).

contemporary patent doctrine, independent inventors are infringers, and independent invention of a patented technology is not a defense to an infringement suit.[38] Contemporary patent doctrine, however, does not violate either the reward or the baseline principles as defined above because it lacks a defense for independent inventors. PW1 is not only a possible world in which the *inventor* does not discover the patented technology, it is a possible world in which *nobody* discovers the patented technology during the entire term of the patent. Although it is reasonable to argue that patent doctrine should make accommodations for independent inventors on both efficiency and fairness grounds,[39] they are not required to satisfy the minimalist, consensus position mapped out by the reward and baseline principles.

B. Constructive Nonvolition

Defendants in patent infringement suits commonly argue that a patentee's rights should not be upheld because they do not satisfy the reward and baseline principles, but they do not use these terms. They couch their arguments in a variety of specific doctrines, most all of which point to the same conclusion: the scope of a claim is too broad because it describes PW1 technology, either literally or through the doctrine of equivalents.[40] The argument may sound in claim construction: the meaning of claims terms should be interpreted so that the claims describe only the technology that the

[38] *See supra* note 5 (discussing innocent infringement).

[39] *See, e.g.*, Stephen M. Maurer and Suzanne Scotchmer, *The Independent Invention Defense in Intellectual Property*, 69 ECONOMICA 535-547 (2000) (arguing that an independent invention defense maintains sufficient incentives to invent while reducing dead-weight loss); Gordon, *Harms & Benefits*, *supra* note 31, at 450 n.2 (noting that the fairness argument supporting intellectual property is undermined in patent law because independent invention is not a defense to infringement).

[40] Through descriptive language, claims mark the literal "metes and bounds" of an inventor's property interest. Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502, 510 (1917). However, patent owners can exclude the public not only from technologies literally described by a claim but also from technologies that are equivalent to the claim. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 25-28 (1997) (reaffirming the vitality of the doctrine of equivalents).

inventor has "actually invented" and nothing more.[41] It may sound in novelty or nonobviousness: claims cannot encompass prior art technologies that the inventor did not invent, either literally[42] or through the doctrine of equivalents.[43] It may sound in enablement or written description: valid claims cannot describe technologies unrelated to those disclosed in the patent.[44]

In most instances, these scope-limiting tools are the only tools that courts need to enforce the reward and baseline principles. Cases involving defendants who qualify for the constructive-nonvolition exemption from strict liability, however, are the exception to this rule.[45] A case in which a constructive-nonvolition exemption applies does not involve a claim that is overbroad on its face. It involves an unjustifiable restraint on the public's ability to avoid the use of a patented technology. More specifically, a defendant uses a patented technology in a constructively nonvolitional manner whenever he must give up his privilege to use a valued PW1 technology in order to avoid or reduce the benefit obtained from the patented technology.

Both defendants who use a patented technology through a deliberate act and those who do so through an involuntary act can avail themselves of a constructive nonvolition defense. Although the definition of constructive nonvolition is the same in both types of cases, each is initially introduced independently below.

---

[41] Phillips v. AWH Corp., 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc).
[42] *See supra* note 26 (discussing novelty and nonobviousness).
[43] Wilson Sporting Goods Co. v. David Geoffrey & Associates, 904 F.2d 677, 684-85 (Fed. Cir. 1990) (discussing the "hypothetical claim" limitation on the scope of the doctrine of equivalents).
[44] *See* 35 U.S.C. § 112, ¶ 1 (2000) (setting out the disclosure doctrines).
[45] A proposal for an exemption to strict liability does not run against any inherent, formalistic nature of strict liability. Outside of patent law, strict liability for the appropriation of an entitlement has never meant unconditional or absolute liability. *See* Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE. L.J. 1055, 1060 (1972) (discussing the role of the cheapest cost avoider in defining the limits of strict liability in tort).

1. Deliberate-Act Cases

The concept of constructive nonvolition in a deliberate act case is best introduced through an example, and the unusual facts pleaded by the plaintiff in *SmithKline Beecham Corp. v. Apotex* provide an excellent one.[46] In the 1970s, SmithKline Beecham ("SmithKline") invented and patented a specific form of crystalline paroxetine hydrochloride ("PHC") which for simplicity can be labeled Form One of PHC. In the mid to late 1980s, SmithKline invented and patented a new and more stable form of PHC—Form Two. SmithKline received FDA approval to market PHC as an antidepressant drug under the name Paxil®. When Apotex applied to the Food and Drug Administration to market a generic version of Form One PHC after the expiration of the Form One patent but before the Form Two patent expired, SmithKline sued. SmithKline argued that Apotex's generic pill infringed their Form Two patent because any attempt to manufacture Form One would necessarily contain trace amounts of Form Two. This factual allegation placed SmithKline Beecham in an awkward but not impossible position. SmithKline had to insist that Apotex's Form One pill would necessarily be contaminated with Form Two to demonstrate use of a substance within the scope of the Form Two claim, but it also had to contend that pure and uncontaminated Form One was all that was produced prior to the invention of Form Two to ensure the validity of its Form Two claim. To thread this needle, SmithKline offered expert testimony on "polymorph" and "seeding" theories. Form Two is a polymorph of PHC that is difficult to produce initially, but, once produced, it is chemically infectious. Crystals of Form

[46] 247 F. Supp. 2d 1011 (N.D. Ill. 2003) (Posner, J.) (*SmithKline I*), *rev'd by* 365 F.3d 1306 (Fed. Cir. 2004) (*SmithKline II*), *vacated by* 403 F.3d 1328 (Fed. Cir. 2005) (*en banc*) (*SmithKline III*), *remanded to* 403 F.3d 1331 (Fed. Cir. 2005) (*SmithKline IV*). The plaintiff's allegations recited in the following text are presented at *SmithKline II*, 365 F.3d at 1308-10.

Two that come into contact with Form One induce the less stable Form One to transform spontaneously into Form Two. SmithKline alleged that "the general environment" and Apotex's factories in particular had become "'seeded' with crystals" of Form Two, making "the creation of a pure version of the old [Form One] difficult, if not impossible."[47]

The courts had such a difficult time addressing SmithKline's alleged facts that the courts repeatedly attempted to render them legally irrelevant,[48] but a second opinion by a panel of the Court of Appeals for the Federal Circuit eventually concluded that the seeding and polymorph theories were unsupported as a matter of fact by the record.[49] The concept of constructive nonvolition, however, allows SmithKline's allegations to be addressed directly and succinctly.

Although the act of hitting the "on" button in the factory was deliberate, Apotex was nonetheless stuck between a rock and a hard place. Its choice set of noninfringing possibilities was impermissibly restricted. To eliminate Form Two from its generic PHC drug, Apotex had two options. It could have abandoned the production of Form One until after the expiration of the Form Two patent, or, as the district court noted, it could

[47] *SmithKline II*, 365 F.3d at 1310. A patent law adage states that if an object that comes into existence after an invention has been made infringes a claim, then the object would have anticipated the claim (i.e. rendered the claim invalid for lack of novelty) if it had existed earlier, before the time at which the invention was made. *See* Knapp v. Morss, 150 U.S. 221 (1983). SmithKline's pleadings respected the rule of law conveyed by this statement but undermined it as a matter of fact, alleging that the nature of the object was changed by the bringing of the invention into the world.

[48] The district court read a variety of limitations on concentration into the Form Two claim to conclude that Apotex did not infringe despite the trace amounts of PHC Form Two in its generic drug. *SmithKline I*, 247 F. Supp. 2d at 1029-30 (N.D. Ill. 2003). An initial opinion of the Court of Appeals for the Federal Circuit overruled this claim construction but held the claim invalid because of a public use under § 102(b). *SmithKline II*, 365 F.3d at 1316-21. Acting en banc, the Federal Circut vacated this opinion. *SmithKline III*, 403 F.3d at 1328.

[49] *SmithKline IV*, 403 F.3d at 1342-46 (concluding that Form Two had always been produced "as a natural derivative of practicing" the method described in SmithKline's Form One patent).

have built a new plant far from the threat of seeding in Antarctica.[50] Critically, these choices are *worse* choices for Apotex than Apotex would have faced if nobody had ever invented Form Two. The invention of Form Two did provide Apotex with a new option in the sense that Apotex could at least try to obtain a license to produce Form Two. However, the invention of Form Two also took extant options away. Apotex is forced to retreat from its PW1 privileges in order to avoid making Form Two entitlement or reducing the benefit that it receives from Form Two.[51] The invention of Form Two together with its dispersal changed the physics of the world in a manner that reduced the set of privileges that a non-infringing Apotex can enjoy in the actual world in comparison to the set of privileges that Apotex can enjoy in PW1.[52] In PW1, Apotex can manufacture Form One of PHC anywhere in the US after the expiration of the Form One patent. In the Actual World, Apotex cannot manufacture Form One outside of Antarctica. The invention of Form Two increased Apotex's options in the sense that Apotex could try to license Form Two or practice it after the expiration of the patent. However, the same invention (together with its dispersal) also decreased Apotex's options, rather than leaving them unaffected, if Apotex chooses not to infringe.

[50] *SmithKline I*, 247 F. Supp. at 1020-21.

[51] In his concurrences in *SmithKline II* and *SmithKline IV*, Judge Gajarsa insightfully framed the question presented by *SmithKline* as a question that focused on the difficulty of avoiding infringement. He argued that the Form Two claim was *per se* invalid under Section 101 because it failed to give the public sufficient notice of how to avoid infringement if a "natural physical process" transformed Form One into Form Two. *See, e.g.*, *SmithKline IV*, 403 F.3d at 1359 (Gajarasa, J., concurring). *But see infra* text accompanying notes 63-64 (arguing that *SmithKline* is not a Section 101 case).

[52] The reduction can be traced to an amalgam of non-legal and legal constraints. The constraint is non-legal in the sense that the "architecture" of the world has changed. *See* Lawrence Lessig, *The New Chicago School*, 27 J. LEGAL STUD. 661, 664-65 (1998) (contrasting law and architecture as distinct modalities of regulation). Whereas performing steps A, B and C in PW1 produces Form One, performing steps A, B and C in the actual world produces Form One with trace amounts of Form Two. Legal constraints contribute to the problem because it is patent law that takes the performance of steps A, B and C in the actual world off the slate of options available to a non-infringer.

Despite the strict liability standard for patent infringement, Apotex should not be held liable. Apotex's deliberate choice to manufacture Form Two is an example of constructive nonvolition. Although contested at various points during the case, the novelty and nonobviousness of the Form Two claim are not the crux of the problem if SmithKline's allegations are taken seriously. Rather, the problem is that the restricted nature of Apotex's options that avoid the use of the claimed technology imposes a cost on Apotex that cannot be justified under the reward and baseline principles.[53] A claim-avoiding Apotex is legitimately expected to bear a cost as part and parcel of a well-functioning patent regime—the opportunity cost of practicing the PW1 art in the actual world rather than the patented technology. If Apotex does not reach a licensing agreement, it must bear the opportunity cost of making a Form One PHC pill when SmithKline can make Form Two. However, the cost to Apotex of avoiding infringement includes the cost of abandoning a privilege enjoyed and valued in PW1, namely the ability to manufacture Form One (or at least to do so elsewhere than on Antarctica). To avoid infringement, Apotex must retreat from its PW1 privileges in violation of the baseline principle. Because SmithKline could prevent Apotex from enjoying PW1 privileges in the actual world if strict liability were strictly construed, SmithKline's reward violates the reward principle. If Apotex were held to be an infringer, the licensing fee that SmithKline could have obtained from Apotex (if Apotex could have obtained a license at all) reflects not only the benefit of Form Two vis-à-vis Form One (the

[53] More precisely, the cost should not be measured by the cost of avoiding the claimed subject matter but rather by the cost of further reducing the benefit obtained from the appropriation. *See infra* text accompanying notes 59-61. However, Apotex can reduce the benefit obtained from the appropriation only by avoiding the appropriation altogether.

opportunity cost of practicing the PW1 art) but also the benefit of being able to produce Form One in the United States rather than in Antarctica.

New terminology is required even to articulate a constructive nonvolition argument. The conceptual stranglehold that a *per se* rule of strict liability holds on patent law is even evident in patent rhetoric: infringement is the only term in the standard patent lexicon to describe a defendant's performance of the steps of a valid method claim or the use of a technology that satisfies all of the limitations of a valid product claim. The existence of liability, however, is built into the concept of infringement. Shorthand for describing a performance or use that satisfies the limitations of the patent claim but that does not imply that the defendant is liable does not exist. This article therefore coins the phrase "appropriation of the patent entitlement" to drive a conceptual wedge and open up a space between the use of a claimed technology and the legal determination of infringement. Apotex appropriated the patent entitlement insofar as it manufactured trace amounts of Form Two and SmithKline's claim was broad enough to encompass a pill that contained these trace amounts. Because Apotex is a constructively nonvolitional appropriator, however, Apotex should not be held liable for patent infringement.

A second illustration of constructive nonvolition in a deliberate act case was explored as a hypothetical in *Monsanto Canada Inc. v. Schmeiser*, a patent infringement case recently decided by the Supreme Court of Canada.[54] Schmeiser was a farmer who grew canola; Monsanto owned a patent that read on canola seeds that were genetically modified ("GM") to be resistant to Monsanto's Roundup herbicide. In 1997, Schmeiser alleged that he discovered herbicide-resistant crops on his farm when a significant percentage of the canola in one of his fields survived after the application of Roundup.

[54] 1 S.C.R. 902 (2004). The facts recited below are summarized in ¶¶ 59-68.

He alleged that the seeds were blown there from a nearby farm or a truck hauling its canola. At the end of 1997, he harvested, segregated and saved the seed from the canola in the field that survived the application of Roundup and used it to plant new fields in 1998. Monsanto sued Schmeiser for patent infringement. Even accepting Schmeiser's allegations, the Court held him liable for patent infringement.

The Court emphasized that its infringement holding did not pertain to the "innocent discovery by farmers of 'blow-by' patented plants on their land or in their cultivated fields."[55] The Court was unable to explain exactly why cultivation of "blow-by" plants did not constitute an infringing use when Schmeiser was strictly liable,[56] but constructive nonvolition provides an answer. If GM seeds are merely blown onto a farmer's land, the farmer could avoid appropriating the GM-seed entitlement altogether by plowing under his fields, letting the crop rot or building at an earlier point in time a fence impermeable to wind-born seeds around his farm. Requiring a "blow-by" farmer to take such measures to avoid appropriating the GM-seed entitlement, however, forces the farmer to abandon privileges that he enjoys in PW1 and thereby violates the baseline principle.[57] In PW1, the patentee can grow non-GM crops and can do so without an

[55] *Id.* at ¶ 2. *See also id.* at ¶¶ 86, 92.

[56] The Court implies that the "blow-by" farmer might not "use" the seeds but might merely possess them instead. *Id.* at 86 (suggesting that the "blow-by" canola farmer might be able to rebut the presumption of use that flows from possession). As in US law, *see supra* note 66 and accompanying text, Canadian patent law requires a claimed invention to be used to trigger infringement. *Schmeiser*, 1 S.C.R. at ¶ ¶¶ 28-58 (discussing Canadian law on use). The position that the "blow-by" canola farmer does not use the claimed invention whereas Schmeiser did, however, is questionable under the Canadian law that the Court discusses.

[57] *But cf. Schmeiser*, 1 S.C.R. at ¶ 86 (suggesting that even the farmer who finds "blow-by" canola seeds on his land might have an obligation to "act[] quickly to arrange for its removal"). The possibility that Monsanto might be able to force the "blow-by" farmer to not cultivate and harvest the GM seeds if it compensated the farmer for any loss incurred by failing to harvest highlights a tension in constructive nonvolition between its efficiency- and fairness-oriented justifications. If efficiency is the guiding principle, then Monsanto should have the right to force the farmer not to cultivate and harvest so long as the farmer is better off financially than he was in PW1. However, if fairness is the dominant concern, then

impermeable fence. In the actual world, the non-infringing farmer is required to bear the opportunity cost of harvesting less-efficient, non-GM canola if he chooses not to license Monsanto's patented GM canola. However, a farmer should not be forced to bear costs above and beyond this limited opportunity cost. The licensing fee that Monsanto could extract from the "blow-by" farmer would include far more than the value of the technology that Monsanto actually invented.[58] This licensing fee demonstrates how the violation of the baseline principle entails a violation of the reward principle, as well.

The actual facts in *Schmeiser* provide a needed refinement on the concept of constructive nonvolition as it has been presented to this point. In the case of both Apotex and the "blow-by" farmer, constructive nonvolition was portrayed as a legal determination that hinged on the cost to the defendant of *avoiding the appropriation* of the patent entitlement. The relevant question, however, is actually the cost to the defendant of *reducing the benefit received from the appropriation* of the patent entitlement. The Court found Schmeiser liable for patent infringement, yet Schmeiser would have had to have incurred the same costs as the "blow-by" to avoid use of the GM-seed technology all together. The difference between Schmeiser and the "blow-by" farmer is that Schmeiser went out of his way to increase the benefit that he received from the GM seeds that had blown onto his land:

> [Mr. Schmeiser] in this case actively cultivated canola containing the patented invention as part of [his] business operations. Mr. Schmeiser complained that the original plants came onto his land without his intervention. However, he did not at all explain why he sprayed Roundup

---

the farmer should have the right to continue the farming practices that he was able to perform in PW1 and he should not be forced to stop farming merely because Monsanto provides compensation.

[58] *Schmeiser* illustrates why it is important to define nonvolition with respect to the opportunity cost of practicing the PW1 art rather than the opportunity cost of practicing the prior art. It makes no difference whether the canola plants that Schmeiser is growing and the fertilizer that he is using were prior art with respect to Monsanto's GM-seed invention. What matters is that Schmeiser's farming of the field is a privilege that Monsanto cannot possibly take credit for based on its invention of the GM seed.

> to isolate the Roundup Ready plants he found on his land; why he then harvested the plants and segregated the seeds, saved them, and kept them for seed; why he next planted them; and why, throughout this husbandry, he ended up with 1030 acres of Roundup Ready Canola which would otherwise have cost him $15,000.[59]

Schmeiser could have reduced the benefit that he received from the appropriation without retreating from the PW1 baseline.[60] He could have avoided planting fields of Monsanto's GM canola during the 1998 year without incurring costs other than the opportunity cost of practicing the PW1 art. Holding Schmeiser liable for patent infringement violates neither the baseline nor the reward principle. In contrast, the "blow-by" farmer could not even have reduced the "benefit" received from use of the patented technology without engaging in a forced retreat from his PW1 life.[61]

The relevance of the defendant's ability to reduce the benefit obtained from the appropriation is also highlighted in a hypothetical variation on the facts of *SmithKline*. Xetopa, a different defendant in *Apotex*, manufactures PHC using a process that produces a pill of almost pure Form Two PHC. Xetopa cannot avoid appropriating the Form Two entitlement without abandoning a PW1 privilege, yet holding Xetopa liable as an infringer violates neither the baseline nor the reward principles. Xetopa could alter its conduct and act like Apotex did without abandoning a PW1 privilege. In other words, Xetopa could have reduced the benefit that it obtained from the appropriation, so Xetopa is not a constructively nonvolitional appropriator.[62]

---

[59] *Schmeiser*, 1 S.C.R. at ¶ 87. *See also id.* at ¶ 92.

[60] If Schmeiser applies Roundup to his field in PW1 in 1997, all of the canola plants die.

[61] From a patent-law perspective, the "blow-by" farmers are receiving a benefit, namely the use of the patented technology. Many "blow-by" farmers who sell organic or non-GM crops, however, see the arrival of GM seeds on their land as a cost. *See* Jane Matthews Glenn, *Footloose: Civil Responsibility for GMO Gene Wandering in Canada*, 43 WASHBURN L.J. 547 (2003) (surveying Canadian civil-law remedies for farmers whose crops are contaminated by GM seeds).

[62] Third-party conduct raises an interesting problem for constructive nonvolition. In a variation on *SmithKline*, assume that seeding is not easily accomplished and that it requires the release of Form Two in

Schmeiser and the Xetopa hypothetical illustrate that constructive nonvolition applies to individual defendants, not to claims generically. The constructive nonvolition inquiry in deliberate act cases acknowledges that "natural phenomena" such as shifting chemical structures and self-germinating seeds throw a wrench in the routine workings of patent doctrine, but it offers a defendant-specific defense rather than a more traditional "natural phenomena" defense under Section 101 of the Patent Act that invalidates the entire claim as a claim to unpatentable subject matter.[63] Thanks to "natural phenomena," a patented GM seed blown into a field containing a similar crop germinates and grows, forcing the farmer to take active steps to avoid appropriating the entitlement.[64] In contrast, a patented widget that is not self-animated by "natural phenomena" is merely possessed, not used, when it falls off of a truck into a farmer's field. However, the existence of "natural phenomena" bound up with the patented technology is not a sufficient condition to render constructively nonvolitional *all* acts that appropriate the patent entitlement. Schmeiser purified the "blow-by" crop after it blew into his field; Xetopa made a patented chemical because it had a longer shelf life than the prior art chemicals did. In these last examples, "natural phenomena" do not place the defendants in an impermissible bind. The defendants are infringers because they could have reduced

---

a special, aerosol form within the production facility where Form One is made. If Apotex itself releases the aerosolized Form Two, Apotex is an infringer when it tries to produce Form One. However, what is Apotex's status if a third party not in collusion with Apotex releases the aerosolized Form Two? Should it matter if the third party is negligent? These questions may become important in cases involving the spread of GM seed technology.

[63] Section 101 invalidates any claim that reads on "natural phenomena" because "natural phenomena" are unpatentable subject matter. *See* Diamond v. Diehr, 450 U.S. 175, 185 (1981). Interestingly a concurrence in *SmithKline*, *see supra* note 51, and a dissent in *Schmeiser*, 1 S.C.R. at ¶¶ 107-11 (Arbour, J., dissenting in part), both relied on arguments related to unpatentable subject matter to conclude that the defendants were not liable.

[64] The constructive nonvolition implicated in the "blow-by" variant on *Schmeiser* is not specific to self-replicating GM seed technology. If a patented, long-lasting fertilizer blew onto a farmer's fields, the "natural process" through which the fertilizer nourishes plants means that the farmer would be "using" the patentee's fertilizer entitlement for many years. The self-replicating nature of the technology changes the stakes for the patentee, but it does not change the legal determination of constructive nonvolition.

the benefit that they received from the patented technology without abandoning options that they possess in PW1.

2. Involuntary-Act Cases

Compared to the deliberate-act cases, the involuntary-act cases are the low-hanging fruit of an argument that constructive nonvolition should provide an exemption from strict liability in patent law. As an exceptional rather than routine occurrence, any patent claim can give rise to an involuntary-act case.[65] We all lose control occasionally. A patentee claims a method of stretching the human body that recites tumbling steps, and an alleged infringer trips and reflexively performs the claimed method to avoid injury. A patentee claims a method of fermentation that recites the act of raising the temperature of a compound according to a particular formula over time, and an alleged infringer has a sample of the compound that is heated up in this manner because of an intermittent power outage in his freezer. Because object claims are infringed only when the defendant *inter alia* makes, uses or sells a claimed embodiment of the object,[66] they too can give rise to involuntary-act cases. A patentee claims an improved stapler, and an alleged infringer passes out, falls on an unauthorized embodiment of the stapler and staples a document.

As in the deliberate act cases, holding a defendant in an involuntary-act case *per se* liable for patent infringement can violate both the reward and baseline principles. The problem in these cases is the excessive cost that the defendants would incur in order to reduce the benefit obtained from the patented technologies. The defendants cannot

[65] *But cf. infra* notes 115-120 and accompanying text (arguing that reflexive thought-propertizing claims may be appropriated through involuntary acts on a routine basis).
[66] 35 U.S.C. § 271(a) (2000).

rationally choose not to perform the involuntary act,[67] and an injunction against the performance of the involuntary act is a contradiction in terms.[68] Appropriation of the patent entitlement, however, is not always entirely beyond the control of the defendant in an involuntary-act case. Sometimes, it would have been possible for a defendant to avoid creating the conditions under which the involuntary act of appropriation can occur. The fainter could have stayed out of the bubble of space surrounding the patented stapler; the freezer-owner could have chosen not to own freeze the compound. Here, however, the cure is worse than the disease. Requiring potential defendants to avoid involuntary entitlement-appropriating acts makes the claims sticky in a way that pulls all sorts of conduct within the control of the patentee, although not within the literal scope of the claim. A fainter who must not approach within four feet of a stapler is far worse off than he was in PW1, and the price that the fainter will pay to be able to approach within four feet of a stapler is out of proportion to the benefit of the technology actually produced by the patentee.[69]

---

[67] The fact that we do not engage in a conscious cost-benefit analysis prior to every choice that we make does not mean that the choices are not rational. *See* LANDES & POSNER, *supra* note 16, at 4. Nonetheless, an assumption that a choice could be made is foundational to the rational maximization of ends, and no possible choice-point exists immediately prior to an involuntary act.

[68] A state-enforced right to exclude is not a straight jacket rule. *Cf.* Lessig, *supra* note 52, at 664-65 (contrasting law and architecture as distinct modalities of regulation). The *sine qua non* of legal protection of an entitlement with property rule is that the state backs up a private individual's right to exclude with its authority and power. The hope, however, is that the state will not be called upon to overtly act in most instances, that the background threat of ex post, state-imposed sanctions will deter the rational personal-welfare maximizer ex ante from appropriating the entitlement without the owner's consent and that market exchanges of entitlements will flourish. A right to exclude from others' involuntary conduct, however, does not promote market exchanges because the appropriation of an entitlement to others' involuntary conduct cannot be deterred. Depending on one's temperament, a right to exclude from others' involuntary conduct is either laughable or Kafkaesque. Either the entitlement will simply go unprotected or appropriators will eventually be sent to jail for contempt of court when they routinely violate an injunction against appropriation.

[69] The difficult question that the involuntary-act, constructive-nonvolition cases raise is not whether the reward and baseline principles are violated. They clearly are. The difficult question is whether certain involuntary actors should be exempted from strict liability when no innocent actors are exempted. *See supra* note 5 (noting the plight of innocent infringers under contemporary patent doctrine). It is reasonable, however, to exempt the former but not the latter for two reasons. First, neither more clarity in patent scope

The involuntary-act cases instinctively raise questions about *per se* liability in part because of their strong resemblance to conventional, nonvolitional-act cases in criminal law and trespass. In criminal law, a nonvolitional act is a sub-category of the conduct that fails to satisfy the "voluntary act" requirement.[70] Roughly speaking, the voluntary act requirement prohibits punishments based solely on statuses, mental states, all but exceptional omissions and involuntary bodily movements.[71] Voluntary bodily movements that were punishable were distinguished from involuntary ones that were not by the presence a mental "volition" or wish to perform the act antecedent to the act.[72] Volitional acts were therefore the muscular contractions that a person wills, authors or ushers into being[73] whereas nonvolitional bodily motions originated from some source other than an "individual self" and elude the individual's control.[74] Nonvolitional bodily

---

nor more thorough patent searches can resolve the problem created by constructive nonvolition. Second, the litigation costs generated by a constructive-nonvolition exemption for some involuntary actors are not as systemic as those that would be created by an exemption for innocent infringers. A large percentage of defendants in patent cases can raise a colorable invalidity argument and can therefore lay claim to being innocent infringers. Few defendants, however, will be able to allege a non-frivolous and involuntary entitlement-appropriating act.

[70] The voluntary act requirement is sometimes seen as a unifying principle for all criminal liability, including strict liability crimes for which there is no *mens rea* requirement. *See, e.g.*, Model Penal Code §2.01 (1962) ("A person is not guilty of an offense unless his liability is based on conduct which includes a voluntary act or the omission to perform an act of which he is physically capable."); MICHAEL MOORE, ACT AND CRIME: THE PHILOSOPHY OF ACTION AND ITS IMPLICATIONS FOR CRIMINAL LAW 18-165 (1993). Whether the voluntary act requirement is a useful concept, however, is open to debate. Can the voluntary act requirement provide a philosophical metanarrative that helps to legitimate criminal law as a field? *Cf.* JEAN-FRANCOIS LYOTARD, THE POSTMODERN CONDITION: A REPORT ON KNOWLEDGE xxiv (1984) (identifying the postmodern with a skeptical posture toward metanarratives). Or, is it an ill-advised and obfuscating appellation for a loosely affiliated set of normative rules that address situated problems? *Compare* MOORE, *supra*, at 18-165 (arguing that the voluntary act is a meaningful category), with *Symposium, Act & Crime*, 142 U. PA. L. REV. (1994) (presenting a variety of critiques of Moore's position). Constructive nonvolition in patent law is not affected by this debate.

[71] MOORE, *supra* note 70, 6-7 (1993). A combination of retributivist and utilitarian reasoning supports the social choice not to punish defendants for nonvolitional acts. Individuals should not be held morally responsible for conduct that they did not author in any meaningful way, Kevin W. Saunders, *Voluntary Acts and the Criminal Law: Justifying Culpability Based on the Existence of Volition*, 49 U. PITT. L. REV. 443, 467 (1988), and legal sanctions cannot readily deter conduct that is beyond an individual's control. W. LAFAVE & A. SCOTT, CRIMINAL LAW § 3.2(c), at 197-98 (2d. 1986).

[72] HART, *supra* note 3, at 97-99 (1968) (summarizing Austin's conception of volition).

[73] *Id.*

[74] *See* Saunders, *supra* note 71, at 467.

actions result when the motion is compelled by another (coercion), triggered by pain or physical contact (reflex) or ordered by a person's unconscious mind (automatism).[75] A disease, not an individual-as-subject, causes an epileptic seizure.[76] Trespass, too, illustrates the role of nonvolition in some forms of strict liability.[77] Although innocent invasions are trespasses, nonvolitional invasions are not. If the immediate muscular movement that propels my body or some other object across a boundary line is a volitional act that has been willed by my acting self, the invasion is voluntary regardless of a lack of knowledge about the location of the boundary. However, if my "friend" throws me across the line or I have an epileptic seizure that propels me, I am not strictly liable for trespass regardless of the amount of actual damage inflicted.

The appropriation of a patent entitlement through an involuntary act, however, is not sufficient evidence to let the appropriator off of the infringement hook. The following tale of two appropriators illustrates that the involuntariness of the immediate act of appropriation should not be a condition that is sufficient to allow the appropriator to evade liability. Joe performs the recited method because he happens to walk by a patented stapler when he has a sudden and unexpected panic attack. Joe faints, lands on the stapler and appropriates the stapler entitlement. Unlike Joe, Jane stands over a patented stapler, uncorks a bottle of ether, inhales the ether, faints, falls onto the stapler and staples the document. Joe is a constructively nonvolitional appropriator. In order to avoid appropriating the entitlement, Joe would have had to incur far more than the

[75] HART, *supra* note 3, at 95-96.
[76] *Id.* at 98 (quoting Austin).
[77] Trespass to land is technically an intentional tort, RESTATEMENT 2D OF TORTS § 158 (defining trespass to land), but the required intent exists whenever there is will or volition to move the body, *id.*, § 8A (defining intent). *See also* PROSSER & KEETON ON TORTS (5th ed. 1984) at 73-74, § 13 ("[A]ll acts in the sense of movements of the body directed by the will are intentional.").

opportunity cost of practicing the PW1 art in the actual world. Jane, however, could have avoided appropriating the entitlement without abandoning valued PW1 privileges. Jane could have chosen not to stand over the patented stapler and inhale ether.[78] Jane's act of infringement in a narrow time frame is equally as involuntary as Joe's. She cannot help but fall after she looses consciousness. Nonetheless, in terms of patent liability, Jane should be no different than someone who just presses down on the stapler with the palm of the hand.

3. Unifying the Deliberate- and Involuntary-Act Cases

In both the deliberate and involuntary case-types, a constructive-nonvolition exemption to strict liability is required to ensure respect for the reward and baseline principles. If the defendant cannot reduce the benefit obtained from the patented technology in the actual world without being forced to abandon valued PW1 technologies, then the defendant's appropriation of the claimed entitlement should not render the defendant liable for patent infringement.

Importantly, the claim-construction and the invalidity doctrines that are most commonly used to prevent violations of the reward and baseline principles cannot detect the violation at issue in a constructive nonvolition case. As Figure 1 illustrates, the literal

[78] Jane performed a set of actions that are part of the PW1 art. She located herself in space and inhaled ether. If we presume that she performed these actions because she valued the stapling that resulted in the actual world and not the acts that led up to the stapling, then Jane is an infringer. Forcing Jane to avoid appropriating the entitlement does not force her to abandon *valued* privileges in PW1. If Jane could make a good-faith argument that she values inducing unconsciousness in this manner at random locations in PW1, however, only then would she be a constructively nonvolitional appropriator. She would be forced to abandon a valued PW1 privilege in order to avoid appropriation. As this example suggests, constructive nonvolition in involuntary-act cases can frequently be reduced to a question of intent: Did the defendant specifically intend to perform the involuntary act? *Cf. infra* text accompanying note 159 (discussing the role that intent plays in distinguishing infringers from constructively nonvolitional appropriators in cases involving reflexive thought-propertizing claims).

scope of the claim involved in a constructive nonvolition case is not overbroad in a way that courts using these doctrines are able to detect or address:

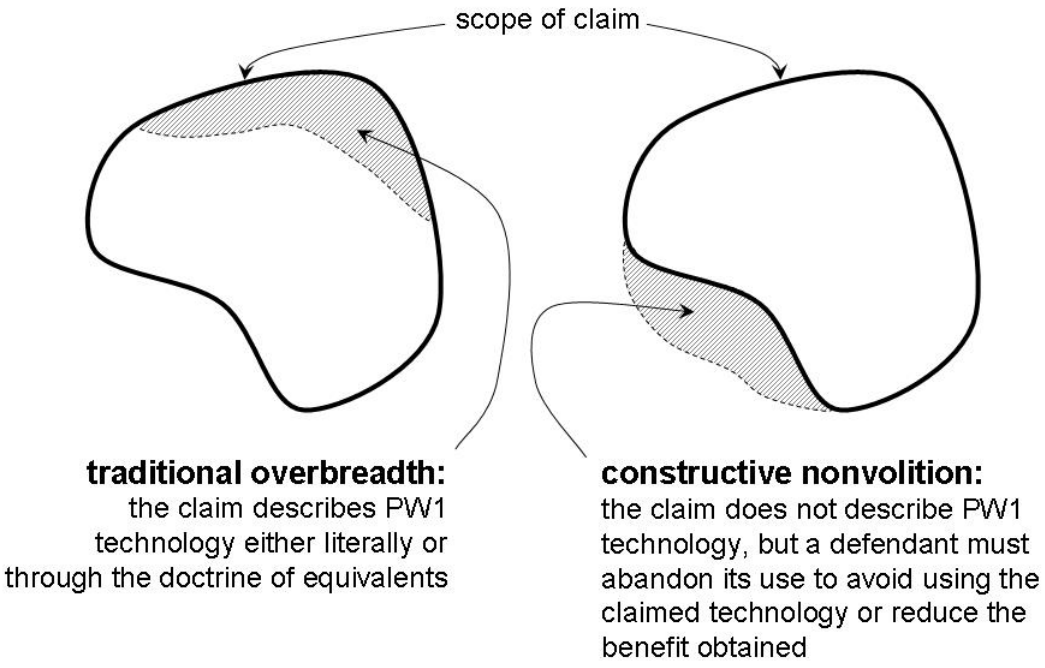

FIGURE 1

The crux of constructive nonvolition lies not in an unjustified presence within the claim's figure as it does in the traditional overbreadth scenario (on the left of Figure 1), but rather in an unjustified absence—traceable to an involuntary action or a self-perpetuating "phenomenon of nature"—from a particular defendant's privileges that comprise the ground around that figure (on the right of Figure 1). Both an oversized figure and an insufficiently sized ground, however, produce the same, result: a violation of both the reward and proportionality principles.

As just suggested, the involuntariness of the immediate act of appropriation in the involuntary-act case serves more or less the same role in those cases that the

inevitableness of the "phenomena of nature" serves in the deliberate-act case. Both raise red flags indicating that the defendant's set of non-appropriating or benefit-reducing choices may be constrained.[79] However, as Figure 2 illustrates, neither an involuntary, immediate act of appropriation nor the presence of a self-perpetuating "natural phenomena" is sufficient to prove constructive nonvolition and an unjustifiable constraint:

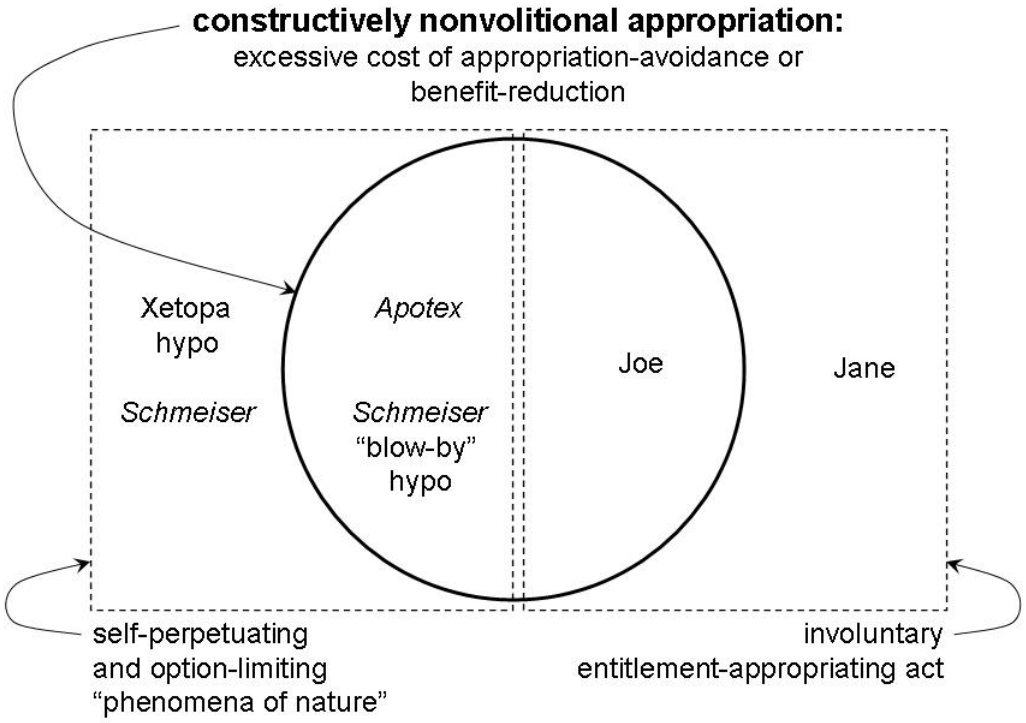

FIGURE 2

In both case-types, the definition of constructive nonvolition is identical: constructive nonvolition arises when the privileges that the defendant values in PW1 cannot be

[79] The red flag may fly higher in the involuntary-act case. It may therefore be reasonable to believe that an involuntary, entitlement-appropriating act produces a presumption that, if unrebutted, a constructive-nonvolition exemption from strict liability should apply, whereas the presumption is reversed in a deliberate-act case.

enjoyed in the actual world if the defendant structures his activities so as to further minimize his invasion into the patentee's inventive terrain.

II. PATENTING REFLEXIVE ACTS OF THINKING

This section describes the propertization of reflexive thought. It argues that constructive volition has a larger role to play in cases alleging infringement of reflexive thought-propertizing claims than it has played in cases involving any previously known category of claims, and that the equation of strict and absolute liability is therefore more likely to be problematic in cases involving claims to reflexive thought. The first part defines the propertization of thought and introduces claim 13 in United States Patent 4,940,658[80] ("the '658 patent"), the claim at issue in *Laboratory Corp. v. Metabolite Laboratories*, as an example of a thought-propertizing claim. The second and third parts distinguish purposive and reflexive acts of thinking and argue that reflexive acts will routinely—not exceptionally as in the involuntary act cases discussed above—appropriate the entitlement described by claim 13. The final part distinguishes two types of reflexive thought-propertizing claims that mark two distinct types of entitlements and that merit distinct analyses.

A. Propertizing Thought[81]

Patent claims that propertize thought present a conceptual difficulty for the patent regime. Traditionally patent law has enforced two distinct and opposed property rules. It treats an invention's claimed embodiments as private property. The public cannot perform the "attaching" and "welding" actions of a claimed method of making a widget

[80] U.S. Pat. No. 4,940,658 (July 10, 1990).
[81] This part summarizes arguments presented at greater length in Section I of Collins, *Propertizing Thought I*, *supra* note 2.

without the patentee's authorization.[82] Simultaneously, however, patent law mandates the creation of a commons or a public domain. The disclosure principles of patent law grant the public a legal privilege to think about the idea that animates the patented attaching/welding invention and to communicate their understanding of it to others. The *quid pro quo* of patent law requires an inventor to disclose information about his invention to the public, information that he could have attempted to guard behind a veil of secrecy if he had not sought a patent.[83] Once disclosed, this inventive information passes beyond the control of the inventor. It becomes freely available to the public so long as it remains in the form of information *qua* information.[84]

Historically, these two opposing rules co-existed rather peacefully, side by side at the heart of patent law. The boundary between the realms in which each applied was marked by the intuitive line that divides goods that exist in the spatial world of extension from information goods that reside primarily in the realm of information and ideas. We readily differentiate the propertizable, real-world actions implicated in the process of making widgets from the unpropertizable information *qua* information about widget-making, so the dividing line between the regimes persisted, largely unquestioned and never precisely delineated. The closest the PTO and the courts came to drawing a line came in the form of the now long-dormant mental steps doctrine.[85] However, a patentee

[82] *See* 35 U.S.C. § 154 (2000) (specifying the patentee's exclusive rights).
[83] J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 142 (2001) (quoting Kewanee Oil Col. v. Bicron Corp., 416 U.S. 470, 484 (1974)). The disclosure provisions of Section 112 codify the inventor's disclosure obligations. *See* 35 U.S.C. § 112, ¶ 1 (2000). Importantly, the disclosure provisions are not a natural or inevitable consequence of patent law; they are "*exacted*" from the patentee by design. Eldred v. Ashcroft, 537 U.S. 186, 216 (2003).
[84] *Cf.* 1 CHISUM ON PATENTS, at §7.01 ("On [publication] the patent immediately increases the storehouse of public information available for further research and innovation.").
[85] *See generally* 1 CHISUM, *supra* note 84, §1.03[6]; Collins, *Propertizing Thought I*, *supra* note 2, at Section III.C.1. The mental steps doctrine was notoriously ill-defined and it was never adequately justified. *Cf. In re* Abrams, 188 F.2d 165, 168 (C.C.P.A. 1951) ("It is self-evident that thought is not patentable.").

who seeks to claim, and thus propertize, the mere act of thinking about information offered to the public in the patent's disclosure threatens this informal détente.

The claim at issue in *Laboratory Corp. v. Metabolite Labs.*, a case in which the Supreme Court recently granted certiorari and then dismissed it as improvidently granted after oral argument, is an example of a thought-propertizing claim.[86] Three academic researchers discovered a statistical generalization about the chemical contents of human blood. They realized that two chemicals are inversely correlated: a high total level of one chemical—the protein homocysteine—corresponds to a deficiency of a second chemical—vitamin B, and vice versa (the "Vitamin B12 correlation").[87] The researchers filed *inter alia* two types of claims to protect their work, and both were granted in the '658 patent. The first claim-type, exemplified by claim 1, described a new method of "assaying" or testing the concentration of homocysteine in a patient's blood.[88] This claim was relatively uncontroversial and was never asserted in *Laboratory Corp*. The second claim-type, exemplified by claim 13, recited a two-step method of using a homocysteine test to diagnose the existence *vel non* of a Vitamin B12 deficiency: (1) "assaying" a patient's homocysteine level and (2) "correlating" a low or high level of homocysteine with the presence or absence, respectively, of a Vitamin B12 deficiency.[89] Under the

[86] 126 S. Ct. 2921 (2006) (dismissing the writ of certiorari as improvidently granted). For a full presentation of the *Laboratory Corp.* proceedings, see *infra* notes 166-181 and accompanying text.

[87] Metabolite Labs. v. Lab. Corp., 370 F.3d 1354, 1362 (Fed. Cir. 2004). Technically, the researchers discovered a correlation between "total homocysteine"—a measurement of homocysteine in four different complexed forms—and either of two specific B vitamins—cobalamin (Vitamin B12) or folate. Because this article does not question the novelty or nonobviousness of the correlation, the precise nature of the correlation is not important. Opting for ease of communication over scientific precision, it refers to a correlation between homocysteine and vitamin B12 as a shorthand for the researchers' actual discovery.

[88] U.S. Pat. No. 4,940,658, col. 41, ll. 3-4 (July 10, 1990).

[89] *Id.*, ll. 59-65. This article refers to the process of diagnosing the existence *vel non* of a Vitamin B12 deficiency as simply the diagnosis of a Vitamin B12 deficiency.

standard rules of patent infringement, a doctor infringes claim 13 whenever he performs or causes to be performed both of these steps.[90]

Claim 13 propertizes thought: it recites a human act of thinking that is necessary to make the claim as a whole useful, novel or nonobvious.[91] Three facts are important to explain why claim 13 propertizes thought. First, the researchers did not invent the first homocysteine test. Technologies for testing homocysteine were already known prior to the researchers' work,[92] and elevated homocysteine levels were already believed to be useful for a variety of purposes, including for diagnosing a rare genetic disorder[93] and for assessing the health of a patient's risk of a heart attack.[94] Second, the testing step recited in the claim has a meaning that is broad enough to encompass any technique of testing for homocysteine, regardless of whether a person uses a technique known prior to the researchers' work, developed by the researchers themselves, or discovered only after the researchers filed their patent application.[95] Together, these first two facts demonstrate that the data-gathering, "assaying" step is neither novel nor patentable on its own and that the inventiveness of claim 13 resides entirely in the second "correlating" step. The third

[90] *See* Canton Bio-Medical, Inc. v. Integrated Liner Techs., 216 F.3d 1367, 1370 (Fed. Cir. 2000) (finding direct infringement of a method claim if and only if "each of the claimed steps of a patented process [is] performed").
[91] *See* Collins, *Propertizing Thought I*, *supra* note 2, at Section I.C (defining the propertization of thought).
[92] U.S. Pat. No. 4,940,658, col. 6, ll. 6-8.
[93] *Brief for Appellees* at 43 & n.12, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004). This article refers to the knowledge used to perform this diagnosis as the "genetic-disease correlation."
[94] *Brief for Petitioners* at 3, Lab. Corp. v. Metabolite Labs., 126 S. Ct. 2921 (2006); *Corrected Brief for Appellant* at 13, 31-32, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004); *Brief for Appellees* at 12, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004). However, widespread clinical acceptance of the practice of using elevated homocysteine levels as a predictor of vascular disease did not develop until the 1990s, after the issuance of the '658 patent. *Lab. Corp.*, 126 S. Ct. at 2923; *Corrected Brief for Appellant* at 13-14, 31-32, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004). This article refers to the knowledge used to perform this diagnosis as the "vascular-disease correlation." For other alleged uses for homocysteine tests, see *Corrected Brief for Appellant* at 32-33, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004).
[95] Lab. Corp. v. Metabolite Labs, 126 S. Ct. 2921, 2924 (2006) (Breyer, J.) (dissenting from the dismissal) (noting that the parties agree on this construction of "assaying"). The defendant in *Laboratory Corp.* was using a homocysteine test that was an improvement on the researchers' method recited in claim 1. Metabolite Labs. v. Lab. Corp., 370 F.3d at 1359.

fact is that the "correlating" step describes a human act of thinking. More specifically, it recites an applied act of human reasoning that a doctor can employ to verify the truthfulness of a conclusion about an individual patient's Vitamin B12 deficiency.[96] After performing the homocysteine test, a doctor presumptively has two pieces of knowledge. He knows from the test that an individual does or does not have an elevated homocysteine level. He also knows the statistical generalization discovered by the researchers given that it was published in the patent and general medical literature. Once in possession of those two pieces of information, the doctor can perform the act of "correlating" recited in claim 13: he can verify the truthfulness of the conclusion that his patient does (or does not) have a Vitamin B12 deficiency.[97]

B. Purposive and Reflexive Acts of Thinking

The acts of thinking that might fall within the scope of a patent claim span a spectrum from purposive to reflexive. We perform some mental tasks only after we have deliberately decided to undertake them. If most people are presented with six numbers between 100 and 999 and are instructed to determine their product by multiplying them together, many could likely perform the assigned task in their minds if they were given sufficient time, but most could also get up and walk away from the table without having reasoned through the problem to produce an answer.[98] The mental task is therefore a purposive act of reasoning. Our acting selves set our minds to the task. The occurrence of the act of reasoning is not by default beyond our control and is deterrable.

---

[96] *See* Collins, *Propertizing Thought I*, *supra* note 2, at Section I.D.2 (describing the logical structure of the claimed act of reasoning).

[97] Because a person who does not know about the correlation will not perform the claimed method, patent searches that uncover reflexive thought-propertizing claims do not allow defendants to avoid infringement, they perversely cause infringement.

[98] *But see* text accompanying *infra* note 114 (discussing automatism and the light-bulb-in-the-shower myth).

Many of the historical mental-steps cases involve claims to purposive acts of thinking. The claims recited complex mathematical operations and had value primarily they read on computer software, but they were nonetheless sometimes broad enough to read on human thought.[99] In fact, the Supreme Court's first attempt at resolving the patentability of computer software involved precisely such a thought-propertizing claim. In *Gottschalk v. Benson*, the Court addressed the patentability of a "method for converting binary coded decimal number representations into binary number representations."[100] One of the *Benson* claims was arguably broad enough to read on mental performance of the method,[101] but the lengthy series of discrete acts recited in the claim could in all likelihood be performed mentally only after a deliberate choice to set one's mind to the task and only with prolonged and focused concentration.

In contrast, other acts of thinking just seem to happen. When we say that our minds jump to a conclusion, we do not understand the process to involve one part of our minds—the part in which volition is determined—instructing another part to jump or engage in the logical operation. These acts of thinking are involuntary or reflexive. If I tell you (a) that I parked your convertible outside with the top down and (b) that it is raining, you don't need consciously decide to work through an extensive syllogistic reasoning process with unstated intermediate premises (e.g. things exposed to the sky get wet if it is raining and most things parked outside are exposed to the sky) to realize that the interior of your car is probably getting wet. You reach the conclusion automatically.

---

[99] Collins, *Propertizing Thought I*, *supra* note 2, at Section III.C.1.
[100] 409 U.S. 63, 73-74 (1972).
[101] The Court construed the claims broadly enough to read on more than mere computer implementation of the recited operations. *See id.* at 68 (noting that the method may be performed "without any apparatus"). One of the two claims before the court, however, arguably was limited to computer implementation. *See id.* at 73 (reciting one claim requiring the step of "storing the ... signals in a reentrant shift register"). The *Benson* Court did not address the propertization of thought.

A doctor who performs the correlating step of the *Laboratory Corp.* claim thinks reflexively. If a doctor is exposed to the premises of the claimed act of reasoning, the doctor's mind will automatically jump to the conclusion. A doctor who has read about the inventor's discovery and who looks at the results of a patient's homocysteine test will instantly reach a conclusion about whether or not the patient has a Vitamin B12 deficiency, likely without any conscious awareness of having reasoned through a statistical syllogism. In other words, claim 13 is a *reflexive thought-propertizing claim.*[102]

The intuition that some acts of thinking are reflexive and not preceded by volition to think is reinforced by the "dual process theory" in cognitive psychology.[103] The dual process model distinguishes between two "systems" of human reasoning that coexist in the human mind and that perform differently in terms of speed and controllability.[104] "System 1" reasoning is "quick", "intuitive" and "effortless";[105] it is "implicit", "unconscious" and "automatic".[106] In contrast, "system 2" reasoning is "slow",

---

[102] Because it tracks an ambiguity in all patent rhetoric, this article uses the term "reflexive act of thinking" in two different ways. When describing the scope of a claim, the term is used to designate a type—a category of thinking that is commonly performed in a reflexive manner. When describing an act of infringement, the phrase is used to describe a token—a particular mental act or instance of thinking performed by a doctor.

[103] *See generally* K.E. STANOVICH, WHO IS RATIONAL? STUDIES OF INDIVIDUAL DIFFERENCES IN REASONING 144-48 (1999); JONATHAN ST. B. T. EVANS AND DAVID E. OVER, RATIONALITY AND REASONING 141-62 (1996); Daniel Kahneman & Shane Frederick, *A Model of Heuristic Judgment*, *in* Keith J. Holyoak & Robert G. Morrison, *Thinking and Reasoning: A Reader's Guide*, *in* THE CAMBRIDGE HANDBOOK OF THINKING AND REASONING 267-69, 272-74, 288 (Keith J. Holyoak et al. eds., 2005); Steven A. Sloman, *Two Systems of Reasoning*, *in* HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 379-96 (Thomas Gilovich et al. eds., 2002); Jonathan St. B. T. Evans, *In Two Minds: Dual-Process Accounts of Reasoning*, 7 TRENDS IN COGNITIVE SCIENCE 454 (2003) [hereinafter *Two Minds*]; Jonathan St. B. T. Evans, *Logic and Human Reasoning: An Assessment of the Deduction Paradigm*, 128 PSYCHOLOGICAL BULLETIN 978, 988-89 (2002) [hereinafter *Reasoning*]. *Cf. also* MOORE, *supra* note 70, at 49 n.6 (distinguishing a "mental act" that "I can will myself to" perform and other "mental states" that are basically passive and not "willable").

[104] Kahneman & Frederick, *supra* note 103, at 267. Some neurophysiologists argue that the two systems operate in spatially distinct parts of the brain. Evans, *Two Minds*, *supra* note 103, at 456.

[105] Kahneman & Frederick, *supra* note 103, at 267-68.

[106] Evans, *Reasoning*, *supra* note 103, at 989.

"effortful", "deliberate" and "rule" oriented;[107] it is "explicit", "conscious" and "controllable".[108] In sum, "[t]he assumption is that System 2 thinking is ... volitional ... whereas System 1 thinking is not."[109] The dual process theory reinforces the notion that some System 1 thinking is "rapid, parallel and automatic in nature"[110] and thus beyond the control of the thinker, just like the examples of appropriation in the involuntary-act cases that involve bodily motion.[111]

The dual process theory also offers some insight into what types of thinking are likely to be reflexive. Among its other characteristics, System 1 thinking is commonly implicated "when we make practical decisions that help us to achieve our personal goals."[112] It is pragmatic, contextualized and based on our previously held beliefs.[113] In contrast, System 2 thought is often so abstract that we cannot use our previously held beliefs and so counterfactual that we must fight against our previously held beliefs.[114]

---

[107] Kahneman & Frederick, *supra* note 103, at 267-68, 288.
[108] Evans, *Reasoning*, *supra* note 103, at 989.
[109] Evans, *Two Minds*, *supra* note 103, at 456.
[110] *Id.* at 454.
[111] *See supra* notes 65-69 and accompanying text.
[112] EVANS & OVER, *supra* note 103, at 147.
[113] Evans, *Reasoning*, *supra* note 103, at 989.
[114] *Id.* The object of introducing the dual process theory, however, is not to scientify the law on constructive nonvolition in patent infringement cases involving reflexive thought-propertizing claims. Courts grappling with such cases should not identify the claimed act of thinking as an example of System 1 or System 2 thought and then automatically conclude that a thinker appropriated the entitlement with an involuntary or voluntary act, respectively. The System 1/System 2 distinction is not a strict dichotomy; the variables that distinguish the two systems are continuous, not binary. Kahneman & Frederick, *supra* note 103, at 288. Classifications are not even stable: a mental task can migrate from System 2 to System 1 for a particular thinker as a thinker becomes familiar with it. *Id.* at 268 (discussing automatism and giving the example of the "proverbial chess master who strolls past a game and quips, 'White mates in three'"). Furthermore, the dual process theory often suggests both/and rather than either/or answers. For many problems, System 1 provides us with snap judgments and offers a form of rough-and-ready, bias-prone thinking that leans heavily on factual context and previously held beliefs. System 2 kicks then in after a time delay and seeks to correct errors by undertaking a normatively driven and rule-based analysis of the problem. Daniel Kahneman & Shane Frederick, *Representativeness Revisited: Attribute Substitution in Intuitive Judgment*, *in* HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 51-52 (Thomas Gilovich et al. eds., 2002). Finally, the System 2 label may not be of much legal import at all. The light-bulb-in-the-shower myth of how we often solve complex puzzles when we least expect it suggests that we may not have the ability to turn our minds off and prevent them from engaging in a great deal of System 2 thinking. The notion that thinking that is volitional to a cognitive psychologist may be very different from the notion that

C. Propertizing Reflexive Thought

Claims that propertize reflexive acts of thinking raise the same problem of constructive nonvolition discussed in Section I on a new scale, previously unseen in patent law. They describe a type of conduct that is both inventive and routinely performed in an involuntary manner. To the extent that they are contingent on trips, power outages and fainting spells befalling the defendant, involuntary-act cases will be rare and often monetarily insignificant.[115] However, with reflexive thought-propertizing claims being issued by the PTO, we no longer need to resort to the extraordinary to tell a story that involves an involuntarily performed, entitlement-appropriating act. Claims reciting reflexive acts of thinking describe a type of mental activity that includes a very high percentage of involuntarily performed and allegedly infringing act-of-thinking tokens. Furthermore, the step that is commonly performed in an involuntary manner is the inventive step of the method. If the inventive step that differentiates the claimed method from the prior art were a deliberate step, then the entitlement as a whole could only be appropriated through a deliberate act.[116] Reflexive acts of thinking are unusual in that they are both occasionally inventive[117] and routinely performed involuntarily.[118] If the inventive step is commonly performed in a reflexive manner, then the possibility that

---

bodily actions are volitional in the eyes of a court. The latter are purposive because we can usually choose both to perform and not to perform them.

[115] *See supra* notes 65-69 and accompanying text (offering hypotheticals to illustrate constructive nonvolition in involuntary-acts cases).

[116] More accurately, the entitlement would only be appropriated involuntarily in exceptional cases involving trips, power-outages and fainting spells.

[117] An act of reasoning of a known type, e.g. a statistical syllogism, is novel and nonobvious whenever it incorporates newly discovered and unexpected factual information as a premise. The act of "correlating" is novel and nonobvious if the statistical generalization linking homocysteine and Vitamin B12 is new and unexpected.

[118] The unusual nature of this combination is highlighted by the difficulty of a claim-drafting exercise in which the assignment is to formulate a claim in which a reflexive bodily act such as "blinking" is the inventive step.

a defendant who is doing nothing more than practicing the prior art described in the initial steps of a claim will appropriate the claimed entitlement is significant.[119]

In sum, a defendant who performs the entitlement-appropriating act in an involuntary manner is no longer the exception. He may even represent the norm in infringement actions involving reflexive thought-propertizing claims. It is true that some thinkers who act involuntarily when their conduct is narrowly framed should be held liable as infringers.[120] The point to be made here is not that all defendants in infringement cases involving reflexive thought-propertizing claims are constructively nonvolitional appropriators. The point is rather that there will be quantitatively many more involuntary-act cases involving reflexive thought-propertizing claims than other types of patent claims. Because of the possibility of inventive, reflexive steps in method claims, the shift from extra-mental to mental activity as the referent of a patent claim radically increases what is at stake in a court's decision to adopt a constructive nonvolition defense to strict liability.

D. Two Types of Entitlements

This part draws a distinction between two types of entitlements to reflexive acts of thinking: free-standing, reflexive acts of thinking and irrevocable bundles. The distinction is not a strict dichotomy. It establishes two poles of a spectrum that measures the degree of control that potential defendants can exercise in their attempts to avoid appropriating a patent entitlement. Even if idealized, the distinction proves useful for

[119] The heightened possibility of an involuntary act that appropriates a patent entitlement is contingent on the reflexive act being the final act of a claim. The addition of a deliberate, non-inventive step to a claim after the reflexive act of thinking can also eliminate routine, involuntary acts that appropriate the entitlement. *See infra* notes 201-202 and accompanying text (discussing thought-propertizing claims with speech limitations).

[120] *See supra* note 78 and accompanying text (presenting the "Jane" hypothetical in an involuntary-act case).

grappling with the problem constructive nonvolition raised by reflexive thought-propertizing claims in a systematic fashion and identifying why claim 13 of the '658 patent in particular is a special type of reflexive thought-propertizing claim that merits closer attention.

1. Free-Standing, Reflexive Acts of Thinking

Some reflexive thought-propertizing claims create entitlements to *free-standing, reflexive acts of thinking*. For example, claim 13 arguably does not need to recite its data-gathering step as a scope-limiting precondition. Without affecting its novelty or nonobviousness, claim 13 could recite only the second, correlating step without the first, testing step.[121] A doctor could infringe this hypothetical, one-step variant of claim 13 without performing a homocysteine test. He could encounter the informational premises required to trigger the reflexive act of thinking almost anywhere. He could read the results of an individual's homocysteine test published in a newspaper or on a chart of a patient of another doctor in the practice. He could in theory merely remember the results of a homocysteine test performed at some point in the past.[122] Patients would infringe whenever they are informed of their own homocysteine test results and the statistical generalization linking Vitamin B12 and homocysteine.

If strict liability is equated with absolute liability, an entitlement to a free-standing, reflexive act of thinking is essentially an entitlement to others' involuntary

[121] Whether this hypothetical, one-step variant of claim 13 would satisfy the Section 101 patentable subject matter requirement is uncertain. Doctrinally, it is possible that the PTO would invalidate the one-step variant of claim 13 under Section 101 even if it did not invalidate claim 13 itself. *See Ex parte* Bilski, (B.P.A.I., Sept. 26, 2006) (advisory opinion) (suggesting that the PTO might reject a claim to purely mental steps). Normatively, however, there is no clear reason why the variant should recite unpatentable subject matter if the actual claim 13 does not.

[122] Reflexive thought-propertizing claims that do not recite data-gathering steps raise an additional, "counting" problem: If a doctor reads the results of a homocysteine test and then recalls the results an hour later, has he infringed once or twice?

conduct. The conduct described by the claim is performed involuntarily in a narrow time window, and potential defendants have no control over their ability to avoid mental exposure to the information that triggers the claimed, reflexive act.

Other claims that do not describe free-standing, reflexive acts of thinking in their starkest form are nonetheless reasonably considered as functional equivalents of claims that do if potential defendants have insufficient control over their ability to avoid exposure to the information that triggers the reflexive act of thinking. A claim might expressly recite a data-gathering step as limitations, yet this step might only trigger the claimed, reflexive act of thinking only once in a blue moon. If someone were to discover that people who drive red Honda Civics in New York are twice as likely as other drivers to suddenly step on their brakes, he could file a patent claim in which the inventive step involved "correlating the presence of a red Honda Civic in New York with a higher likelihood of an erratic driver."[123] Although the claim might expressly include an initial data-gathering step such as "watching traffic in New York" as a limitation, the expectation of seeing a red Honda Civic after any deliberate act of traffic-watching is relatively low.

The need for a constructive-nonvolition exemption at the least to reduce the strictness of strict liability for appropriators of entitlements to free-standing, reflexive acts of thinking is self-evident.[124] A *per se* entitlement to others' involuntary conduct produces a property regime that is riddled with Pareto-inferior, judicially forced exchanges, violating both the reward and baseline principles. Because the equation of

[123] *Cf.* Collins, *Propertizing Thought I*, *supra* note 2, at Section II (noting that claim 13 of the '658 patent is a template for a broad array of thought-propertizing claims).

[124] Rather than looking for constructive nonvolition on a case-by-case basis, the Federal Circuit may prefer to invalidate all claims that will be routinely appropriated through involuntary acts to head off the costs of administering a constructive-nonvolition exemption at the pass. *See infra* note 199 and accompanying text.

strict liability and absolute liability is absurd on the face of a claim to free-standing, reflexive act of thinking, this article gives such a claim no further attention.[125]

---

[125] Although it eventually proves unsuccessful, an attempt at a justification for a rule of *per se* liability for appropriating entitlements to free-standing, reflexive acts of thinking should sound in restitution, not property. Defined broadly, restitution is the law of "benefit-based recovery." HANOCH DAGAN, THE LAW AND ETHICS OF RESTITUTION 1 (2004). As Wendy Gordon has illustrated, the plight of the producer of information goods who receives no intellectual property protection can readily be analogized to the plight of a plaintiff in restitution. *See* Gordon, *Harms & Benefits*, *supra* note 31, at 463 (framing an author seeking as a plaintiff in restitution); Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutionary Impulse*, 78 VA. L. REV. 149, 221-66 (1992) [hereinafter *Owning Information*] (arguing that a slimmed-down version of copyright can be justified by the law of restitution). The inventor who publishes inventive information bestows a benefit on the public. The public is usually better off after having learned the inventive information than it was before, even if the marginal benefit provided by the information is a small one. The public that learned the inventive information and that put it to use by thinking about it, however, did not request the benefit. There is no contract. The inventor, therefore, must sue in restitution and demand payment from the thinker who has been unjustly enriched at the inventor's expense. Restitution frowns on these types of claims. When the bestower of an unrequested, non-monetary benefit seeks recovery from the benefited party, the bestower is dismissed as a "volunteer" or "officious intermeddler" without recourse in the law. *See* RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT § 23 & cmt.a (Tentative Draft No. 2, April 1, 2002); John P. Dawson, *The Self-Serving Intermeddler*, 87 HARV. L. REV. 1409, 1409 (1974). The strong, negative rule against restitution (except under exceptional circumstances) is motivated by respect for the benefited parties' autonomy- and efficiency-enhancing freedom to order their own priorities. DAGAN, *supra*, at 140-41. Markets and the voluntary exchanges that they entail, not judicially forced exchanges, are the preferred means of facilitating exchange. Saul Levmore, *Explaining Restitution*, 71 VA. L. REV. 65, 68-69 (1985) ("[T]he general law of restitution seeks to encourage private bargaining rather than to replace it with judicial intervention.").

A justification of the officious-intermeddler rule that relies on fostering private bargaining, however, cannot explain the inventor's inability to recover in restitution because the likelihood of a robust market for inventive information absent intellectual property protection is unlikely to develop. Inventive information is a public good, *see supra* note 14, and the market failures associated with public goods are well known. *See, e.g.*, Gordon, *Owning Information*, *supra*, at 233-38 (discussing the search costs and strategic bargaining problems that confront authors who try to reach ex ante contracts guaranteeing payment for their works). Because voluntary exchanges in a market are not feasible, an exception to the rule against recovery in restitution for the bestowal of unrequested benefits should apply and should allow an inventor to recover the benefit bestowed on involuntary thinkers. In fact, in his recent book on restitution, Hanoch Dagan has proposed precisely such an exception from the general, negative "officious intermeddler" rule when the benefit in question involves significant externalities vis-à-vis the benefit-provider and a collective action problem is likely to prevent a market from developing to provision the good. DAGAN, *supra*, at 130-48 (defending a "collective goods" exception that is not reflected in contemporary doctrine on normative grounds). Even Dagan's exception, however, does not support a *per se* liability rule for appropriation of patent entitlements to free-standing, reflexive acts of thinking. Dagan imposes two restrictions on his exception, and a patentee of a reflexive thought-propertizing claim can satisfy neither. *But cf. id.* at 136-39 (imposing another restriction on the scope of the exception that derives from relative judicial and legislative competence).

First, recovery in restitution can only be justified if it is "objectively clear that ... defendants' proportionate benefit exceeds the cost to them of contributing the proportionate share of the cost of supplying the benefit." *Id.* at 135. Patent damages, however, have no relation to the cost of producing the inventive information, *see supra* note 16 and accompanying text, and involuntary thinkers are likely to subjectively devalue the benefit obtained from the inventive act of thinking in relation to the traditional patent-law remedy, *see supra* note 37. The exception is appropriate (and subjective devaluation is low) only when the interests of the plaintiffs and defendants in restitution are "locked in," DAGAN, *supra*, at 131, so that the agency costs—the costs generated when "decisions by the agent ... deviate from the decisions

2. Irrevocable Bundles

Claim 13 of the '658 patent is a special type of reflexive thought-propertizing claim because it satisfies three conditions. First, a data-gathering step limits the scope of the claim. A doctor only infringes claim 13 if he initially tests for homocysteine and then correlates. Second, the data-gathering act is by default deliberate and deterrable.[126] Third, as per the district court in *Laboratory Corp.*,[127] the act of thinking inevitably follows the gathering of the data that enables the reflexive thought. When these three conditions pertain, the entitlement described by the claim is an *irrevocable bundle* of a data-gathering step and the inventive, reflexive act of thinking. If a claim describes an irrevocable bundle rather than a free-standing, reflexive act of thinking, then the entitlement at issue need not be viewed as an entitlement to others' involuntary conduct.

---

which would have been made by the principal if he had the same information and talents as the agent"—are low, *id.* at 138-49. Rarely are the interests of an inventor of a reflexive act of thinking locked in with all of the people who reflexively perform the act of thinking.

Second, recovery in restitution is only appropriate if the cause of action in restitution is the likely but-for cause of the production of the benefit. *Id.* at 131, 135. There is nothing inherently inefficient or wrong with positive externalities that go uninternalized. Dawson, *supra*, at 1412 ("Uncompensated gains are pervasive and universal; our well-being and survival depend on them."); Gordon, *Owning Information*, *supra*, at 167-69 (arguing that "culture *is* interdependence and that free riding is not inherently wrongful); Lemley, *Free Riding*, *supra* note 18, 1046-69 (defending the efficiency-enhancing role of free riding in intellectual property). Welfare spillovers are detrimental only if they are sufficiently large to destroy the incentive of any individual or group capable of concerted action to generate a good or benefit. Dagan, *supra*, at 131 (arguing that restitution should be employed to solve a collective action problem "only in types of cases where free-riding may frustrate the possibility of achieving the collective good itself" absent recovery in restitution); Lemley, *Free Riding*, *supra* note 18 (arguing that intellectual property is justified only to the extent that it is necessary to encourage invention). It is highly questionable whether recovery by patentees from constructively nonvolitional appropriators is necessary to ensure the production of a distinct class of information. If patent protection were to be denied in an entire industry such as biotechnology, then a particular class of inventive information might not be produced. However, when the additional protection sought is recovery from constructively nonvolitional thinkers, it is entirely possible that the patentee is merely trying to internalize spillovers from an otherwise profitable venture. The underlying information protected by claims to free-standing, reflexive acts of thinking may be partially protected by enforcement against appropriators who do not fall within the constructive-nonvolition exemption and other, traditional patent claims. *Cf. supra* text accompanying note 88 (noting that the researchers who discovered the Vitamin B12 correlation also invented a patentable method of assaying for homocysteine).

[126] Just like any claim, claim 13 may be appropriated nonvolitionally under exceptional circumstances. An over-worked and under-slept resident might scribble in a box on a diagnostic form in a state of automatism. This exceptional case is ignored; claims to irrevocable bundles are presumed to be appropriated only by deliberate acts.

[127] *See infra* notes 169-170 and accompanying text.

The entitlement describes the data-gathering/act-of-thinking bundle and is appropriated by a deliberate act in all but exceptional cases.

The concept of an irrevocable bundle is intended to reframe what the inventor has actually invented. Like an alien invader or virus, the reflexive nature of the act of thinking incorporates the act of thinking into the very being of preexisting data-gathering technology from the date of invention forward. Although the data-gathering step pre-existed the reflexive act of thinking, the two can no longer be separated after the discovery and exhaustive publication of the statistical generalization that enables the latter. It is entirely beyond the power of a doctor who gathers data about an individual's homocysteine level to perform the data-gathering step without also performing the reflexive act of thinking. The doctor cannot order a different product that does not have the vitamin-deficiency diagnosis feature; the reflexive act of thinking cannot be removed from the product through redesign. The doctor cannot even contractually agree not to engage in the act of thinking because it is reflexive. There is neither a physical nor a legal means to dissociate the data-gathering step from the act of thinking.[128]

The act of invention coupled with wide-spread publication irrevocably transforms what had been a plain old homocysteine test into the test bundled together with the reflexive act of thinking. The theory of an irrevocable bundle is not dissimilar to the polymorph and seeding theories put forward in *SmithKline*.[129] Before the invention of Form Two in *SmithKline*, Form One of PHC was available as a distinct product. From the date of the invention forward (with a bit of a lag to allow the seeding process to take

[128] A doctor may, however, contractually agree not to express the conclusion of the reflexive act of thinking. *Cf. infra* notes 201-202 and accompanying text (discussing reflexive thought-propertizing claims with express speech limitations).
[129] *See supra* text accompanying notes 46-47 (describing the Smithkline's polymorph theory).

place), Form One only existed in a bundle with trace amounts of Form Two. A reflexive thought-propertizing claim that marks an entitlement to an irrevocable bundle accomplishes this end by indelibly bonding an inventive act of thinking onto a pre-existing data-gathering step rather than transforming an inventive chemical into a distinct, prior-art chemical.

There are several reasons for examining entitlements to irrevocable bundles as a category that is distinct from entitlements to free-standing, reflexive acts of thinking. Most significantly, if the bundle itself is the invention, then requiring potential defendants to avoid performing the data-gathering step is not a request that is overbroad with respect to what is required to avoid appropriating the entitlement. The immediate act of appropriation is by default willed and deterrable. In other words, entitlements to irrevocable bundles give rise to deliberate-act, not involuntary-act, cases, and the "red flag" for a constructive-nonvolition exemption flies lower in the deliberate-acts cases.[130] Claims to irrevocable bundles also appear to be the type of reflexive thought-propertizing claim that is most commonly sought by patent applicants and issued by the PTO. "Test and correlate" claims are commonplace in the medical profession,[131] and they provide a template that can be used in any field of technology.[132] In part, this apparent empirical prevalence of claims to irrevocable bundles may flow from the fact that that claims to

[130] *See supra* note 79.

[131] For example, a district court recently addressed a claim to a method of detecting autism comprising the steps: "obtaining" a sample, "analyzing" the sample for the presence of certain compounds and "correlating the quantity of ... at least one compound with an autism condition or lack thereof in said patient." U.S. Pat. No. 5,686,311, col. 16, l. 63 to col. 17, l. 9 (Nov. 11, 1997); Great Plains Lab., Inc. v. Metrametrix Clinical Lab., 2006 WL 2663680, at *7-*8 (Sept. 15, 2006) (No. 04-2125-JTM) (construing the term "correlating"). *See also* Lab. Corp. v. Metabolite Labs., 126 S. Ct. 2921, 2929 (2006) (Breyer, J.) (dissenting from the dismissal) (noting that the Solicitor General opined that the Court's ruling in Laboratory Corp. would affect a "substantial number of patent claims").

[132] Collins, *Propertizing Thought I*, *supra* note 2, at Section II (demonstrating that claim 13 of the '658 is a template for an array of thought-propertizing claims that spans different fields of technology).

free-standing, reflexive acts of thinking wear the problems of constructive nonvolition and the propertization of thought on their sleeves. Although the precise doctrinal reason why claims to free-standing, reflexive acts of thinking would not be patentable when claims to irrevocable bundles are patentable is unclear,[133] they may be more likely to raise the eyebrows of a PTO examiner or a federal judge. In part, the preference for claims to irrevocable bundles may flow from the relatively lower costs of monitoring for infringement. Infringement of an irrevocable bundle can often be metered by the thinkers' requests for the relevant data. Finally, if for no other reason, claims to irrevocable bundles merit special attention to shine light on the constructive nonvolition problem in the very form that confronted and bested the Supreme Court in *Laboratory Corp.*

III. IRREVOCABLE BUNDLES AND *LABORATORY CORP.*

This section argues that claims to irrevocable bundles require a constructive-nonvolition exemption from strict liability. As a prelude, it contrasts the conventional story of a complement good that is an improvement on existing technology with a story that depicts an irrevocable bundle as an improvement. The heart of this section then demonstrates that the difference between these stories creates distinct economic and constitutional overbreadth problems if courts apply strict liability strictly and fail to recognize a constructive-nonvolition exemption. It concludes with an analysis of the lower courts' treatment in *Laboratory Corp.* of a claim to an irrevocable bundle.

[133] *See supra* note 121.

A. Irrevocable Bundles and Improvement

An irrevocable bundle is an unusual kind of improvement invention. It overrides a failsafe mechanism on which patent law relies to police both the reward and baseline principles.

To understand the novelty of an irrevocable bundle (both in the patent-law sense of novelty and in the sense of the newness of the legal problem that an irrevocable bundle creates), it is helpful to think about the data-gathering step and the reflexive act of thinking as distinct goods. The non-inventive data-gathering step is good X, and the inventive reflexive act of thought is good Y.[134] In claim 13 of *Laboratory Corp.* fame, good X is the act of testing for homocysteine, and good Y is the mental act of using the Vitamin B12 correlation to diagnose the patient. Good Y is an improvement invention in the sense that it makes good X more valuable and increases demand for good X, but not in the sense that good Y supplants sales of good X. In other words, good Y is an improvement on good X in the form of complement rather than a substitute.[135] Furthermore, good Y is a perfect complement to good X because good Y can only be used in conjunction with good X.[136] A doctor can only perform the correlating step after he tests for homocysteine.[137]

Invention scenarios involving goods like goods X and Y (at least as described so far) are well-known staples of patent law. Preexisting good X could be a pencil and

---

[134] *But cf. infra* notes 147-148 and accompanying text (noting that X and Y are not distinct goods in an economic sense if they are perfect, mutual complements).

[135] Complement goods tend to be used together. Two goods are mutual complement goods if a decrease in price of good X increases demand for good Y and vice versa. In contrast, substitute goods tend to be used in the alternative. Two goods are mutual substitute goods if an increase in the demand of good X increases the demand for good Y and vice versa. PINDYCK & RUBINFELD, *supra* note 14, at 25-26, 34-35, 109-110.

[136] *Id.* at 70.

[137] If good Y were not the act of thinking about the Vitamin B12 correlation required to diagnose a patient but instead were an act of thinking about the Vitamin B12 correlation generically, it would not be a perfect complement.

inventive good Y could be a wedge-shaped eraser cap that fits over the non-writing end of the pencil. The invention of the eraser cap increases demand for the pencil because the pencil is now a more useful object, and the eraser cap is for all practical purposes useless without the pencil.[138] Good Y could however just as well be a better pencil sharpener, a chemical that is only useful for producing a yellow, graspable coating for pencils or a new method of using a pencil (but not a pen) to perform calculus rapidly.

In these traditional, complement-good invention scenarios, good X remains a market option that is more or less unaffected by the invention of good Y. Pencils still exist even after the invention of the eraser cap. When good X is a data-gathering step and good Y is a reflexive act of thought that together form an irrevocable bundle, however, good X does not remain a market option after the invention of good Y. The very invention and publication of the reflexive act of correlating irrevocably transforms the data-gathering step into a data-gathering/reflexive-act-of-thinking bundle. Good X ceases to exist. Only good XY now exists. With respect to the invention recited by claim 13 of the '658 patent, the invention of the act of correlating homocysteine and B12 vitamins makes the purchase of the homocysteine test "neat" a factual impossibility. Only the homocysteine-test/act-of-correlating-to-B-vitamins bundle persists in the post-invention world.

Recounting the traditional invention scenario in a manner that captures the nature of an irrevocable bundle requires narrating the story in a Bizzaro World. It is as if the very invention of the eraser cap miraculously, physically and indelibly bonds eraser caps onto all of the ordinary pencils that will ever be manufactured. Irrevocable bundles

[138] The required assumption is that nobody uses an eraser cap to erase unless it is on the end of a pencil. An eraser cap might be small and therefore, unlike a normal eraser, difficult to hold in one's fingers while erasing.

created by the invention of a reflexive act of thought raise an unprecedented factual scenario of invention in which perfect complement goods that improve on pre-existing goods are factually compulsory.[139]

In the traditional complement-good improvement scenario, the continued availability of the improved on good is a failsafe that prevents violations of the both the reward and baseline principles.[140] Traditionally, any claim that is justified by the inventiveness of good Y yet is broad enough to afford the patentee monopoly power in the market for pre-existing good X is invalid for lack of novelty or nonobviousness. A patent based on the invention of the eraser cap does not affect the public's right to enter the market for pencils without eraser caps.

When the improvement good is irrevocably bundled with the improved-on good, however, the improved-on good does not remain a market option after the invention of the improvement. After the improvement invention is made, the improved-on good plain and simple no longer exists. The fail-safe protection for the reward principle malfunctions. Anyone who desires to use good X must purchase good XY because good XY is the only form in which good X persists in the post-invention world. Furthermore, a claim to the irrevocable XY bundle that affords the patentee monopoly power in the market for good X is not invalidated by the novelty or nonobviousness doctrines. The presence of good Y in the bundle assures the inventiveness of the claim to the XY bundle, just like the presence of the inventive eraser cap in the pencil-and-eraser-cap ensures the inventiveness of that combination. As with other constructive nonvolition

[139] The plaintiff's allegations in *SmithKline* fit nicely into this Bizzaro World. *See supra* text accompanying notes 46-47. However, the Form Two (good Y) improvement in *SmithKline* is a substitute rather than a complement for Form One (good X).

[140] *See supra* notes 14-31 and accompanying text (detailing the reward and baseline principles).

cases, the potential problem is not a problem of the figure of the claim being too large vis-à-vis what is new but a problem with the ground beyond the reach of the claim being too small.

B. Economic Overbreadth

An entitlement to an irrevocable bundle is almost always economically overbroad unless a court recognizes a constructive-nonvolition exemption to strict liability for patent infringement.[141] Data-gathering steps in irrevocable bundles vary along a continuous spectrum from *purely monovalent*—those rare activities that are useful only for a single purpose, namely to perform the reflexive act of thought—to *polyvalent*—those more common activities that are useful for diverse purposes. An entitlement to an irrevocable bundle that incorporates a polyvalent data-gathering step violates the reward principle if strict liability is equated with absolute liability. The overbreadth is eliminated, however, if strict liability for patent infringement does not apply to constructively nonvolitional appropriators. An entitlement incorporating a purely monovalent data-gathering step is not overbroad in an economic sense in the first place and does not implicate constructive-nonvolition exemption.

If the data-gathering step is polyvalent and defendants are liable whenever they appropriate an entitlement to an irrevocable bundle, an inventor's right to exclude is broader than what can be justified by the reward principle. As the following figures illustrate, the monopoly power derives in part from demand for technology that the inventor did not actually invent:

[141] The form of economic overbreadth discussed in this subsection has implications both for the reward principles because it extracts payments from people who are only trying to practice privileges that they value and possess in PW1.

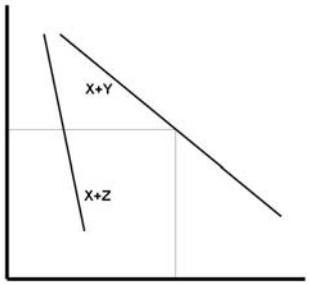

FIGURE 3a

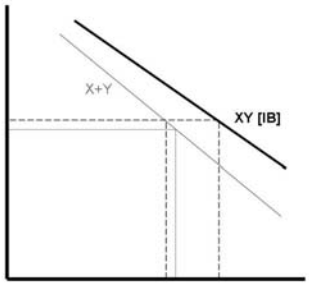

FIGURE 3b

Good X is a pre-existing good (e.g. a data-gathering step), and goods Y and Z are perfect complement goods (e.g. distinct acts of applied reasoning that are useful for distinct purposes and that use the data generated by good X as a premise). Good X is polyvalent because goods Y and Z are both perfect complement goods.[142] Figure 3a depicts demand in a hypothetical world in which good X "neat" continues to exist as a factual matter after the invention of goods Y and Z. In this world, the intentional bundles X+Y and X+Z have their own, unique demand curves. Consumers' willingness to pay for X+Y determines the reward that the inventor can reap from acting as a rational monopolist of good Y.[143] The inventor's profit is unaffected by the demand for good Z, assuming that goods Y and Z are neither substitute nor complement goods. Figure 3b tells a different

[142] It could be that it is the intrinsic value of good X in addition to its use in a patented method that renders good X polyvalent. However, because goods in this section are being sliced so finely that an applied act of thinking is considered a good that is distinct from the test that produces the data being thought about, the contrast of X+Y and X+Z is more in line with the spirit of the exercise.

[143] If good Y is a perfect complement of good X and the market for good X is a competitive one, the profits from monopolies on Y and X+Y are identical in most instances. A patentee who has invented good Y yet who sells only the X+Y bundle may run afoul of the "tying" doctrines in both patent misuse and antitrust law if the markets for X and Y are distinct and the patentee has market power (thanks to his patent) in the market for good Y. *See* Virginia Panel Corp. v. Mac Panel Co., 133, F.3d 860, 869 (Fed. Cir. 1997) (stating the *per se* rule for tying under patent misuse); 9 AREEDA, *supra* note 30, ¶ 1702 (requiring an "anticompetitive effect" or "some relevant foreclosure" in the market for the tied good for an actionable tying offence under the antitrust laws). However, many of the patentees who impermissibly tie, especially those who do so under the patent misuse standard but not under the antitrust standard, do not increase their monopoly profits. They merely leverage their market power into a larger number of sales of pencils at a competitive price. To highlight the parallel to an irrevocable bundle, the analysis in this section presumes that the owner of a patent on good Y may monopolize the X+Y bundle, but the economic arguments made in this section are more precisely directed at a monopoly on good Y plain and simple.

story. It illustrates what happens when the invention of good Y results in a good XY irrevocable bundle. The demand curve for the irrevocable bundle XY is the horizontal sum of the two demand curves in Figure 3a because (a) good X plain and simple no longer exists so (b) any consumer who desires Y must purchase XY and any consumer who values Z must purchase the bundle XY+Z[144] (or XYZ if Z, too, irrevocably bundles itself to X). The owner of the entitlement to the irrevocable bundle profits from consumers who desire only good Z (or bundle X+Z), a good that does not embody the inventive information produced by the patentee. Furthermore, consumers who actually purchase good Y pay more to the patentee when irrevocable bundling occurs than when it does not occur. This result both shifts surplus from consumers to producers and generates additional dead-weight loss.[145]

The more polyvalent the technology and the further good Z proliferates into goods Z_1, Z_2 and Z_3, the more egregious the violation of the reward principle is likely to be. In the same vein, the less valuable the inventive, complement good Y relative to the non-inventive, complement good Z, the more egregious the violation.[146]

---

[144] The demand for the irrevocable bundle can be obtained in this fashion if the group of consumers whose demand is represented on the demand curve for X+Y has no overlap with the group of consumers that generates the demand for X+Z. PINDYCK & RUBINFELD, *supra* note 14, at 116-17. In the context of claim 13, the same doctor may appear on both curves if the homocysteine test is performed on different patients (and wealth effects are ignored). If a single doctor/patient paring is represented on both demand curves, then that consumer's demand is calculated in the possible world with irrevocable bundling through a vertical summation of willingness to pay. *Cf. infra* note 158 (considering consumers with mixed motives).

[145] In the Bizzaro World hypothetical involving the irrevocable bundling of a pencil and an eraser cap, *see text accompanying supra* note 139, irrevocable bundling allows the inventor of the eraser cap to earn a supra-profit on pencils purchased by people who place no value on eraser caps such as (a) writers who never make mistakes and (b) model enthusiasts who build log cabins from pencils. To add insult to injury, these pencil purchasers must pay the inventor of the eraser cap a supra-competitive price that reflects monopoly control over the entire market for pencils, not merely the price that could have been earned by a monopoly in the market for severable eraser caps. *But cf. infra* 146 (describing situations in which a monopoly on an irrevocable bundle lowers the price and increases the consumption of the inventive, complement good).

[146] The weaker the demand for the inventive improvement Y and the stronger the demand for a non-inventive good Z, the more serious the violation of the reward principle produced by an entitlement to an

In contrast, if the non-inventive data-gathering steps incorporated into an irrevocable bundle are purely monovalent, then an entitlement to the irrevocable bundle never violates the reward principle. When good X is purely monovalent, good X and good Y are perfect, mutual complements; there is no demand for one without the other. In economic terms, X and Y are not even distinct goods in this situation.[147] There is no area under the demand curve for good X+Z in Figure 3a, so the demand curve for the irrevocable bundle XY does not move when the two demand curves are summed in Figure 3b. The public is economically indifferent to the disappearance of good X plain and simple in the post-invention world.[148]

However, data-gathering technologies are unlikely to be purely monovalent for three reasons. First, the data-gathering step is never inventive in a thought-propertizing

---

irrevocable bundle. However, consumers who actually desire the inventive good Y rather than the non-inventive good Z may ironically be better off in a world with irrevocable bundling than they would have been in a world without it. This situation is illustrated in Figure 3c where the labels on the two demand curves from Figure 3b are flipped:

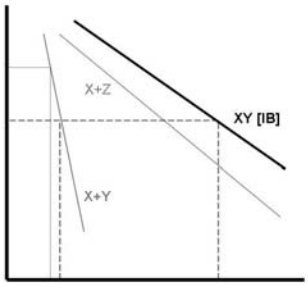

FIGURE 3c

The rational monopolist charges a lower price for the irrevocable XY bundle than he charges for the intentionally bundled good X+Y in the possible world without irrevocable bundling. The reward-principle violation, however, is much more severe. There is nothing inherent in the factual/legal conception of an entitlement to an irrevocable bundle that suggests *ex ante* that irrevocable bundles will create problems that resemble Figure 3b more often than Figure 3c. The Figure 3c problems, however, are more likely to make a judge at least raise an eyebrow before equating strict liability with absolute liability.

[147] *Cf.* 10 AREEDA, *supra* note 30, ¶ 1743a, 1751e (evidence of buyer interest in a separate product is necessary to allege that two distinct products are tied together). A common example of perfect, mutual complements is a pair of shoes, left and right.

[148] *But cf. infra* notes 160-165 and accompanying text (suggesting that irrevocable bundles that incorporate purely monovalent goods might be unconstitutional even if they are not economically overbroad).

claim.[149] Few technologies will exist in a state of absolute economic uselessness prior to the invention of a complement, improvement good. Second, the data-gathering step must remain purely monovalent throughout the term of the patent. If a data-gathering step is purely monovalent at the time of invention but becomes polyvalent during the term of the patent, an entitlement to an irrevocable bundle is economically overbroad prospectively from the time the polyvalence develops. A patentee who monopolizes a polyvalent technology that he did not invent is profiting from more than what he actually invented regardless of the point in time at which the technology became polyvalent.[150]

Third, a purely monovalent technology incorporates a very restrictive definition of uselessness. In patent law, the courts and the PTO have interpreted the utility requirement to allow only patents on compounds that have a "specific and substantial utility."[151] Viewed in the negative, compounds that are only useful as inputs into further research to achieve as-of-yet insufficiently specified goals are legally useless and unpatentable.[152] This utility-doctrine definition of uselessness, however, is much broader than an economic definition of uselessness. The value that the research community places on a technology as an input into ongoing research activities demonstrates that the technology has an economic use even not a legal one. More concretely, we can presume that homocysteine tests have commercial utility only for diagnosing Vitamin B12 deficiencies and nonetheless conclude that homocysteine tests are not purely monovalent technologies. Consumer demand for use of homocysteine tests in ongoing commercial

[149] *See supra* notes 91-97 and accompanying text (defining the propertization of thought).
[150] The economic overbreadth that results from the discovery of new uses for data-gathering steps that previously had been purely monovalent reaffirms that constructive nonvolition must be measured in relation to all privileges in PW1, not only in relation to privileges in the prior art. *See supra* notes 26-28 (defining the contents of PW1).
[151] *In re* Fisher, 421 F.3d 1365, 1370-71 (Fed. Cir. 2005) (citing PTO guidelines).
[152] *See* Brenner v. Manson, 383 U.S. 519, 532-36 (1966) ("[A] patent is not a hunting license.").

research to develop new correlations for homocysteine makes the homocysteine test a polyvalent data-gathering step in an economic sense.[153] A research-oriented use for good X means that goods X and Y are not perfect, mutual complements.[154]

Entitlements to irrevocable bundles are economically overbroad if they allow an inventor to profit from demand for all of the uses of a polyvalent technology that the inventor did not actually invent.[155] A constructive exemption from strict liability for patent infringement, however, rectifies the economic overbreadth problem. Constructive nonvolition lets a defendant who appropriated a patent entitlement off the hook if the cost to the defendant of reducing the benefit obtained from the appropriation requires the defendant to retreat from the baseline of privileges possessed and valued in PW1.[156] This standard effectively requires a court to determine as a matter of fact which of the two

[153] The narrowness of the category of "purely monovalent data-gathering steps" needs to be distinguished from the related-yet-broader category of "non-staple goods" that operates in contributory infringement and patent misuse. The narrowness of the former does not conflict with the breadth of the latter either doctrinally or economically. Under the latter doctrines, companies that sell unpatented goods can be held secondarily liable for patent infringement if, *inter alia*, two conditions pertain. First, the good must be a non-staple good that has no substantial, non-infringing use. *See* 35 U.S.C. § 271(c) (2000) (limiting contributory infringement to sales of non-staple goods); Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176 (1980) (holding that a patentee does not commit patent misuse by suing all possible parties for contributory infringement and making a license to practice a patent available only to those who purchase the non-staple good from the patentee). Because non-staple goods may have insubstantial noninfringing uses, even a polyvalent data-gathering step might be a non-staple good. Second, the purchaser of the unpatented good must use the non-staple good in a way that amounts to direct infringement. Aro Manuf. v. Convertible Top Replacement Co., 365 U.S. 336, 341-42 (1961) (holding that contributory infringement cannot occur without direct infringement). Although it is sometimes implied that the doctrine of contributory infringement coupled with the limitations on the scope of patent misuse allow a patentee to control markets for non-staple goods, this is inaccurate in a technical sense. A patentee can control the market for the use of a non-staple good in a patented invention, but not the market for the insubstantial uses of a non-staple good that are not infringing. The rights of a patentee to affect markets for non-staple goods does not imply that all irrevocable bundles involving non-staple data-gathering steps are immune from economic overbreadth.

[154] *See supra* text accompanying note 147. The research-oriented use of good X is not excused under the common-law experimental use doctrine if the research is commercial or in any other way not "solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry." Madey v. Duke, 307 F.3d 1351, 1362 (2002).

[155] In contrast, all appropriations of irrevocable bundles incorporating purely monovalent technologies are infringers from an economic perspective. The value to the defendant of using good X always lies in the value of good Y, so the cost to the defendant of not appropriating is always equivalent to the opportunity cost of practicing the PW1 art in which good Y does not exist.

[156] *See supra* notes 40-79 and accompanying text.

demand curves in Figure 3a reflects a particular defendant's initial willingness to pay for the irrevocable bundle.[157] On the one hand, if a court decides that an appropriator of the irrevocable XY bundle performed X because he valued Z, the appropriator can succeed in this constructive nonvolition defense. Both goods X and Z exist in PW1. The cost to the defendant of reducing the benefit that he obtained from good Y reflects not only the opportunity cost of avoiding good Y but also the cost of forgoing the use of X+Z. On the other hand, if a court decides an appropriator of the irrevocable XY bundle ordered X because he valued X+Y, then the defendant is an infringer. Because the defendant did not value Z, the cost of not appropriating is no more than the opportunity cost of practicing the art that exists in PW1.[158]

To the extent that the reason for the existence of willingness to pay can be equated with intent, the courts must effectively determine the defendant's intent in order to address constructive nonvolition. Intent, however, is not used to distinguish innocent infringers from the non-innocents. The defendant's knowledge of the patent and his reasonable belief in its invalidity are irrelevant.[159] The relevant intent requires an inquiry into motivation or purpose.

C. Constitutional Overbreadth

Economic overbreadth is not the only repercussion of a court's failure to recognize a constructive-nonvolition exemption from strict liability for patent

[157] In addition, a court must examine the defendant's post-appropriation behavior to see if the defendant could have reduced the benefit obtained from the appropriation. *See infra* 197 and accompanying text.
[158] More difficult questions arise when defendants have mixed motives. These defendants were assumed out of existence by the horizontal summation of the demand curves in Figures 2a to create Figure 3b. *See supra* note 144. Insofar as economic overbreadth is concerned, mixed-motive appropriators who would have been willing to pay the going price for good X+Z in PW1 should be constructively nonvolitional appropriators even if their willingness to pay for the irrevocable bundle in the actual world is attributable in part to a desire for good Y. *But cf. infra* note 164 (discussing defendants with mixed motives and constitutional overbreadth).
[159] *See supra* note 5 (defining innocent infringers).

infringement when a reflexive thought-propertizing claim describes an irrevocable bundle. If courts equate strict liability with absolute liability, an entitlement to an irrevocable bundle unconstitutionally propertizes the prior art.

The Constitution does not give Congress the power to privatize the technological status quo. The Copyright and Patent Clause grants Congress the power "To promote the Progress of ... useful Arts, by securing for limited Times to ... Inventors the exclusive Right to their ... Discoveries,"[160] and the Supreme Court has interpreted this clause to mean that "Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available."[161]

A *per se* right to exclude from an irrevocable bundle does precisely what the Court has prohibited Congress from doing. A non-inventive data-gathering step (good X) is by definition unpatentable prior to the time of the invention. After the invention of a reflexive act of thinking (good Y), the data-gathering step cannot be performed without also performing the reflexive act of thinking. Only the irrevocable bundle (good XY) exists. A right to exclude from the bundle therefore restricts the availability of the pre-existing data-gathering step (good X).[162] If X+Z is in the prior art, then a patent that is

[160] U.S. CONST., art. I, § 8, cl. 8.

[161] Graham v. John Deere, 383 U.S 1, 6 (1966). *See also* Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 146 (1989); Anderson's-Black Rock, Inc. v. Pavement Salvage Co., 396 U.S. 57, 61 (1969).

[162] This argument assumes a technological ontology that frames the data-gathering step as the same technology both before and after the invention of the reflexive act of thinking. In theory, a different ontology could be used to overcome the constitutional objection. The patentee could argue that the patent on the irrevocable bundle does not propertize the prior art because relevant prior-art technology ceased to exist at the moment of the invention. Prior to the invention of the reflexive act of thought, there was a data-gathering technology. After the invention, the data-gathering technology no longer exists. Only a new, bundled technology exists—the data-gathering/reflexive-act-of-thinking technology. This ontology suggests that patent law does not propertize the prior art. Patent law propertizes that which is new, and it is the invention's fault, not patent law's, that the nature of the world changed in a way that prevents the practice of the prior art. Although the concept of an irrevocable bundle is a useful concept, the Court is unlikely to adopt such a counter-intuitive ontology. However, if the irrevocable bundling were to have a

justified by the discovery of good Y cannot take the ability to practice X+Z away from the public.[163]

A constructive-nonvolition exemption from strict liability for patent infringement is required to ensure that the prior art is not unconstitutionally privatized.[164] However, the constructive-nonvolition exemption that is required to prevent constitutional overbreadth is likely narrower than the exemption that is required to remedy economic overbreadth. To the extent that the constitutional overbreadth problem derives from propertization of the *prior art* and not *PW1* art, technological advances that occur after the invention of the reflexive act of thinking are irrelevant to the determination of constructive nonvolition. Restrictions on PW1 art that is not the prior art do not raise a constitutional issue.[165]

---

physical manifestation beyond our gray matter as it did according to the plaintiff's allegations in *SmithKline Beecham v. Apotex*, *see supra* text accompanying notes 46-47, the ontological argument that irrevocable bundling produces a new technology and that the prior art vanishes might carry the day and overcome a constitutional overbreadth challenge to a claim to an irrevocable bundle.

[163] If the constitutional restriction of propertizing the prior art is strictly applied, then any member of the public who places any value at all on X+Z should be able to appropriate the irrevocable XY bundle even if the predominant motive of the appropriator is to obtain good Y. *But see infra* 197 and accompanying text (discussing the role of post-appropriation behavior in identifying constructive nonvolition).

[164] This conclusion is consistent with the Supreme Court's holding in *Dawson Chemical Co. v. Rohm & Haas Co.* 448 U.S. 176 (1980). In *Rohm & Hass*, the Court held that a patentee can sue an unlicensed distributor of an unpatented, non-staple technology for contributory infringement without committing patent misuse. *Rohm & Hass* involved a patent claim to a method of using the prior-art chemical as an herbicide when no other substantial, non-infringing uses for the chemical were known. The patentee sought to become the sole distributor of the chemical, and it sued other distributors for contributory infringement. The Court concluded that the patentee did not misuse its patent rights in seeking to become the sole distributor of the non-staple, unpatented chemical. *Id.* at 220 (noting that the patentee's conduct "affect[ed] only the market for the invention itself"). The patentee's conduct in *Rohm & Hass* did not take away from the public any rights to use the chemical that it already possessed. Contributory infringement imposes secondary liability only when the distributor sells the non-staple chemical to a customer who performs the patented method. *See supra* note 153. Contributory liability does not prevent the manufacture and sale of the unpatented chemical to non-infringing users, e.g. experimenters who are searching for new uses for the chemical and who do not use it as an herbicide. *Rohm & Hass* merely allows a patentee to control markets for the sale of unpatented products to infringing customers. In contrast, a claim to an irrevocable bundle allows the patentee to control all uses of the pre-existing technology without a constructive-nonvolition exemption.

[165] Even irrevocable bundles incorporating data-gathering steps that were purely monovalent prior to the invention may be constitutionally overbroad if the public seeks to use the data-gathering step. However,

D. *Laboratory Corp. v. Metabolite Laboratories*

In *Laboratory Corp. v. Metabolite Laboratories*, the courts failed to identify all of the constructively nonvolitional appropriators of the method of diagnosing Vitamin B12 deficiencies recited in claim 13 of the '658 patent. They granted the patentee economically and constitutionally overbroad protection. To locate the point at which the courts took the wrong turn, this part initially summarizes the judicial proceedings and then proceeds to analyze the lower courts' holding in two steps, first with a simplifying assumption and then with the complicating actual facts of the case.

1. Court Proceedings

Laboratory Corp. v. Metabolite Laboratories brought a patent case involving a reflexive thought-propertizing claim all the way to the Supreme Court,[166] but neither the thought-propertizing nature of the claim nor the possibility of constructive nonvolition were ever expressly raised in the proceedings.

The doctors—the involuntary thinkers and alleged direct infringers of claim 13—were not present in the courtroom. The defendant was Laboratory Corporation of America ("LabCorp"), a company that provides blood analyses, including homocysteine tests, for medical doctors. The plaintiff and exclusive licensee of the '658 patent, Metabolite Laboratories ("Metabolite"), sued LabCorp on a theory of secondary liability, alleging that LabCorp was in effect liable for the absent doctors' direct infringements because LabCorp's homocysteine-test services constituted conduct akin to aiding and abetting the doctors' direct infringement. The district court held LabCorp liable for both

---

given the narrow definition of a purely monovalent data-gathering step, *see supra* notes 149-154 and accompanying text (illustrating the narrowness of a purely monovalent step), such cases will be rare.

[166] 126 S. Ct. 2921 (2006) (dismissing the writ of certiorari as improvidently granted).

contributory liability and active inducement, two different theories of secondary liability, but the Federal Circuit affirmed only on the basis of active inducement.[167]

As part of its determination of LabCorp's damages, the district court and the Federal Circuit both concluded that *all* doctors who ordered the homocysteine test from LabCorp directly infringed Metabolite's claim.[168] This conclusion involves distinct factual and legal components. Factually, the district court found that all doctors who ordered homocysteine tests also performed the mental act of correlating required to diagnose a Vitamin B12 deficiency. In other words, all doctors who performed the homocysteine test appropriated the patentee's entitlement. During its correctly deferential affirmance of this finding, the Federal Circuit even interpreted evidence in the record to mean that "it would be malpractice for a doctor to receive a total homocysteine test without determining [a Vitamin B12] deficiency."[169] This factual finding is open to question but within the realm of possibility. Knowledge of the statistical generalization was wide-spread in the medical community as it was published in the *New England Journal of Medicine*,[170] and the act of correlating described is reflexive.

Legally, however, the conclusion is more troubling: the courts held that all doctors who appropriated the patentee's entitlement were strictly liable for direct patent

[167] Metabolite Labs. v. Lab. Corp., 370 F.3d 1354, 1365 (Fed. Cir. 2004). *Cf. infra* note 186 (discussing the roles of contributory infringement and active inducement in the lower court proceedings).
[168] The court calculated LabCorp's damages based on all homocysteine tests that LabCorp performed. *Metabolite Labs.*, 370 F.3d at 1364. Because nobody is ever held secondarily liable in the absence of direct infringement, Standard Haven Prods. v. Gencor Indus., 953 F.2d 1360, 1374 (Fed. Cir. 1991) ("[T]here can be no inducement of infringement or contributory infringement ... in the absence of direct infringement."), the court necessarily concluded that all doctors who ordered LabCorp's homocysteine tests were direct infringers.
[169] *Metabolite Labs.*, 370 F.3d at 1364.
[170] *Brief for Respondents* at 4, Lab. Corp. v. Metabolite Labs., 126 S. Ct. 2921 (2006).

infringement.[171] In other words, both courts equated strict liability with absolute liability. They failed to flag either the involuntary nature of the entitlement-appropriating act or the potential constructive nonvolition problem that the involuntary act entails. Doctors could order homocysteine tests and put them to several uses prior to the discovery of the statistical generalization linking vitamin B12 and homocysteine that underlies claim 13.[172] Today, however, every doctor who orders a homocysteine test from LabCorp appropriates Metabolite's entitlement if strict liability is equated with *per se* liability. *Laboratory Corp.* therefore may involve some doctors who perform the method of claim 13 in a constructively nonvolitional manner: in order to avoid or even reduce the benefit obtained from the patented, Vitamin-B12-related act of thinking, some doctors may have to abandon a valued privilege that they enjoy in PW1, namely the homocysteine test.[173]

In the lower courts, *Laboratory Corp.* looked like a run-of-the-mill patent case that centered on questions of claim construction, infringement and damages. When the Supreme Court accepted certiorari, however, it actively reframed *Laboratory Corp.* as a case about patentable subject matter under Section 101. Neither the proceedings below nor the petitioner's question on certiorari expressly mentioned Section 101, but the Court requested a brief from the Solicitor General on the question "Is [claim 13] invalid because one cannot patent 'laws of nature, natural phenomena, and abstract ideas'?"[174] The Solicitor General opined that certiorari should be denied because the record below

[171] The legal question pertains to the existence of a constructive nonvolition exception to patent infringement. Whether a particular case involves infringement or constructively nonvolitional appropriation presents an issue of fact.
[172] *See supra* notes 92-94 and accompanying text.
[173] For an extended discussion of which doctors should be constructively nonvolitional appropriators, see *infra* notes 182-197 (discussing doctors who use homocysteine tests to diagnose genetic disorders and those who use homocysteine tests to assess vascular health).
[174] Laboratory Corp. v. Metabolite Labs., 543 U.S. 1185, 1185 (2005) (quoting Diamond v. Diehr, 450 U.S. 175, 185 (1981)).

was insufficiently developed and the case was not "an appropriate vehicle for resolving the Court's question",[175] yet the Court ignored this advice and nonetheless granted the writ.[176] After the parties and numerous amicus had addressed the "law of nature" or "natural phenomenon" question, however, the Court's fervor to address the Section 101 question subsided. Two and a half months after oral argument, the Court reversed course and dismissed the writ as improvidently granted.[177] Justice Breyer dissented from the dismissal of the writ, arguing that the Court should have held claim 13 invalid.[178]

Some issues in *Laboratory Corp.* must have been intuitively troublesome to the Court (or it would not have reached out to grant cert against the advice of the Solicitor General), yet the Court never gained any analytical traction on framing or resolving those issues (or it would not have dismissed the case).[179] One theory to explain the Court's oscillation between passive and aggressive approaches is that the troublesome issue was constructive nonvolition.[180] Justice Breyer was clearly bothered by the notion that "any competent doctor reviewing [the homocysteine] test results ... *automatically* correlate[s] those results with the presence or absence of a vitamin deficiency."[181] At the very end of the proceedings, the problem of constructive nonvolition that is magnified in claims to reflexive acts of thinking could at last be seen, lurking just below the surface.

---

[175] *Brief for the United States as Amicus Curiae*, 2005 WL 2072283 (August 26, 2005).
[176] Lab. Corp. v. Metabolite Labs., 126 S. Ct. 601 (2005).
[177] Lab. Corp. v. Metabolite Labs., 126 S. Ct. 2921 (2006).
[178] *Id.* at 2921-29 (Breyer, J.) (dissenting from the dismissal).
[179] The retirement of Justice O'Connor after the court accepted certiorari may also have influenced the Court's reversal.
[180] The propertization of thought in general may also have been part of the troublesome issue. Not only did Justice Breyer list "mental processes" as a category of unpatentable subject matter, *id.* at 2923, he also noted that Metabolite "cannot avoid the fact that the [claimed] process is no more than an instruction to read some numbers in light of medical knowledge," *id.* at 2928.
[181] *Id.* at 2925; *see also id.* at 2924.

2. Two-Step Analysis

The error of the lower courts' rulings is most clearly presented through a two-step analysis. The first step presumes that homocysteine tests are valuable only for diagnosing Vitamin B12 deficiencies and rare genetic disorders.[182] Under this simplifying assumption, the courts probably came to the proper outcome despite the fact that constructive nonvolition was never expressly addressed. The second step adds the doctors who use homocysteine tests to assess a patient's vascular health into the mix.[183] It argues that many of these doctors are constructively nonvolitional appropriators and that the courts erroneously concluded that they were direct infringers in *Laboratory Corp*. This second step also illustrates the factual difficulty that sometimes accompanies the identification of constructively nonvolitional appropriators.

a. Simplifying Assumption

If homocysteine tests are presumed to be valuable only for diagnosing rare genetic disorders and Vitamin B12 deficiencies, the outcome in *Laboratory Corp.* was at least arguably the correct one. In terms of the XYZ model discussed above, the homocysteine test, good X, is a polyvalent data-gathering step. It can be used in conjunction with the patentee's inventive good Y, the Vitamin B12 correlation. It can also be used in conjunction with good Z, the genetic-disease correlation, that the patentee did not invent and that is represented in PW1 (and the prior art). If the courts in *Laboratory Corp.* had held strictly liable any doctor who valued the homocysteine test only in conjunction with the genetic-disease correlation, claim 13 would have been both economically and

[182] *Cf. supra* note 93 and accompanying text.
[183] *Cf. supra* note 94 and accompanying text.

constitutionally overbroad.[184] To redress the overbreadth issue, the courts must exempt from strict liability doctors who reflexively practice the nonobvious method of claim 13 yet who order the homocysteine test as a means of diagnosing rare genetic disorders. These doctors are constructively nonvolitional appropriators. They merely desire to practice a valued PW1 privilege, and they cannot reduce the benefit that they receive from the patented act of thinking about the Vitamin B12 correlation without abandoning that principle.

Whether any of these doctors who sought to diagnose genetic diseases were actually held strictly liable in *Laboratory Corp.*, however, is difficult to determine. The district court concluded that all doctors who ordered homocysteine tests from LabCorp were direct infringers of claim 13.[185] Nonetheless, it is factually possible that the genetic disease is sufficiently rare that no doctors who ordered homocysteine tests from LabCorp intended to diagnose it.

Interestingly, however, Metabolite itself took a position before the Federal Circuit that *supported* a constructive-nonvolition exemption for the doctors who sought to diagnose the genetic disease. Metabolite argued that doctors who ordered homocysteine tests to diagnose the genetic defect were *not* infringers.[186] Realizing the difficulty of defending the overbreadth that would otherwise result, the patentee became an advocate

---

[184] *See generally supra* text accompanying notes 141-159 (economic overbreadth) and 160-165 (constitutional overbreadth).

[185] *See supra* notes 168-170 and accompanying text.

[186] Metabolite made this argument in the part of its brief that sought to uphold the district court's ruling that LabCorp was contributorily liable for the doctors' direct infringements. *Brief for Appellees* at 43 & n.12, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004). Only parties who sell non-staple goods that cannot be put to a substantial noninfringing use can be held contributorily liable. 35 U.S.C. § 271(c) (2000). Metabolite conceded that the use of a homocysteine test to diagnose the rare genetic condition was a noninfringing use but argued that it was an insubstantial one. The Federal Circuit did not comment on this argument because it affirmed LabCorp's secondary liability only on the basis of active inducement. Metabolite Labs. v. Lab. Corp., 370 F.3d 1354, 1365 (Fed. Cir. 2004).

of constructive nonvolition as an exemption to strict liability (although it certainly did not use this language). It acknowledged that the courts had to separate out the hypothetical demand curves for X+Y and X+Z and that the owner of the entitlement to the irrevocable bundle merited a supra-competitive profit based only on the latter under the reward principle.[187]

b. Complicated Reality

Metabolite made no such constructive-nonvolition concession, however, with respect to the doctors who ordered homocysteine tests in order to assess a patient's vascular health. Neither did the courts acknowledge a constructive-nonvolition exemption to strict liability for these doctors. There was evidence in the record indicating that a significant number of doctors ordered homocysteine tests from LabCorp for the purpose of assessing vascular health,[188] yet both the district court and the Federal Circuit treated all doctors who ordered homocysteine tests as direct infringers.

The economic and constitutional overbreadth that results from holding all doctors who assess cardiovascular health liable as infringers of claim 13 is again evident from the simple XYZ model of irrevocable bundles. The homocysteine test is still good X, and the inventive Vitamin B12 correlation remains good Y. To accommodate another use for the homocysteine test, the genetic-disorder use becomes good Z_1 and the vascular-health use becomes good Z_2. Good Z_2 (the vascular-disease/homocysteine correlation) was known in some form prior to the invention of good Y (the Vitamin B12/homocysteine

[187] It is possible but unlikely that Metabolite was arguing that the doctors who desired to diagnose rare genetic diseases did infringe because they did not know about the Vitamin B12 correlation.
[188] *See supra* note 94.

correlation),[189] so the use of $X+ Z_2$ is both a prior-art and a PW1 privilege. To avoid both constitutional and economic overbreadth, a doctor should not be required to give up the privilege of using the XZ_2 bundle merely to reduce the benefit that he obtains from the patented good XY. Doctors who desire the homocysteine test only as a tool to assess vascular disease are constructively nonvolitional appropriators.

Metabolite argued that the genetic-disease and vascular-health correlations were different in a way that makes a difference. According to Metabolite, doctors who ordered homocysteine tests for the purpose of assessing a patient's vascular health were direct infringers because the method of assessing vascular disease and the claimed method of diagnosing Vitamin B12 deficiencies are in fact one and the same method. In a sense, Metabolite is correct. The briefs on appeal suggest that Vitamin B12 and vascular-health correlations are transitive: Vitamin B12 deficiencies correlate to elevated homocysteine levels which in turn correlate to problems for a patient's vascular health. As Metabolite described the situation, a diagnosis of a Vitamin B12 deficiency identifies a cause of the elevated homocysteine level and an assessment of vascular health identifies its effect.[190] The interdependence of these two correlations, however, cannot justify holding a doctor who seeks to assess a patient's cardiovascular health strictly liable for infringement of claim 13. If anything, it highlights in even greater contrast the need for a constructive-nonvolition exemption from strict liability. The ability to correlate an elevated homocysteine level to vascular disease was in the prior art of the '658 patent. In order to

[189] The correlation between homocysteine and vascular health was initially proposed as far back as 1969. *Brief for Appellees* at 12, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004). It did not gain widespread acceptance as a diagnostic tool in the medical community, however, until after the issuance of the '658 patent. Lab. Corp. v. Metabolite Labs., 126 S. Ct. 2921, 2923 (2006) (Breyer, J., dissenting). *But see infra* 194 and accompanying text (considering the possibility that the contemporary act of correlating is categorically different from the act of correlating that could be performed in 1969).

[190] *Brief for Appellees* at 45, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004).

reduce the benefit obtained from performing the method recited in claim 13, the doctor would have to abandon this privilege that he possesses and values in PW1.[191] By discovering a new cause of a previously known effect of elevated homocysteine, Metabolite seeks a right to exclude that is broad enough to prevent the free use of the homocysteine test to detect the previously known effect.[192]

The bottom line is that the lower courts in *Laboratory Corp.* erred when they equated strict liability with absolute liability. Doctors who use a homocysteine test only to assess a patient's vascular health reflexively appropriate the entitlement described by claim 13, but the constructive-nonvolition exemption should apply. Otherwise, the reward received by the patentee violates both the reward and baseline principles.[193] The fact that the courts erred, however, is not the only lesson that can be gleaned from *Laboratory Corp.* *Laboratory Corp.* allows us to take stock of exactly how difficult it can be to distinguish the defendants who are infringers from those who are constructively nonvolitional appropriators. The distinction entails at least three questions.

---

[191] *But see infra* 197 and accompanying text (discussing a doctor's ability to reduce the benefit obtained from the patent entitlement by altering his post-thinking conduct).

[192] Metabolite characterized the post-'658 invention situation as the "discovery of a new manifestation (vascular disease) of an old problem (B12 ... deficiency)," *Brief for Appellees* at 12, Metabolite Labs. v. Lab. Corp., 370 F.3d 1354 (Fed. Cir. 2004), but Metabolite's own characterization of the record suggests that it is the '658 invention itself that is more accurately described as the discovery of a new cause (B12 deficiency) for an old problem (vascular disease) of elevated homocysteine.

[193] If doctors who appropriate the claim 13 entitlement to assess cardiovascular health are not direct infringers, then the district court also erred in making LabCorp contributorily liable. The homocysteine test has a substantial noninfringing use. *See supra* note 153 (explaining that only sellers of non-staple goods can be contributorily liable). However, the Federal Circuit may not have erred when it affirmed the district court's conclusion that LabCorp was secondarily liable on the basis of active inducement. *See* Metabolite Labs. v. Lab. Corp., 370 F.3d 1354, 1365 (Fed. Cir. 2004). If LabCorp's promotional material emphasized the diagnosis of a Vitamin B12 deficiency rather than the assessment of vascular health, then it may have aided and abetted the infringing doctors. Because the Vitamin B12 and vascular-health correlations are so closely intertwined, however, making a clean distinction between promotional materials that promote one rather than the other would be a difficult task.

First, courts must identify a prior art comprised of acts of thinking, and determine whether an act of thinking that occurs today is part of the prior art.[194] The comparison of contemporary technologies to the prior art is a commonplace patent-law procedure, but it is more difficult when acts of thinking are the technology at issue. Acts of thinking do not leave the same externalized trail to document their existence. Is the vascular-health correlation employed today the same as the vascular-health correlation that was known in 1969, or is it different in some way that is significant? The relatively poor documentation of acts of thinking and our inability to specify their precise contents makes this question a difficult one. Contemporary doctors may well understand the correlation between homocysteine and vascular health in much greater detail than their 1969 counterparts did, and (to use a factually fabricated example) they may know more precisely that an elevated homocysteine level indicates a seventy percent chance of poor vascular health. Do these refinements mean that the contemporary vascular-health correlation is different from or non-obvious in light of the one that exists in the prior art?

Second, assuming that a contemporary act of thinking is not represented in the prior art, a court must determine whether it nonetheless exists in PW1. Here, the courts must engage a mind-bogglingly complex counterfactual hypothetical: What would we know in the possible world that is closest to the actual world yet in which the Vitamin B12 correlation is never discovered? Would we still know in PW1 the more precise refinement of the vascular-health correlation that exists in the actual world today?[195] If the answer is yes, then a doctor who uses homocysteine tests to diagnose a patient's

[194] Examiners and judges also face this problem when determining the novelty and nonobviousness of a thought-propertizing claim.
[195] *Cf. supra* note 28 (discussing the difficulty of identifying the full contents of PW1 with certainty).

vascular health is a constructively nonvolitional appropriator of claim 13 even if the contemporary vascular-health correlation was not in the prior art.

Third, assuming that the contemporary vascular-health correlation is contained in the prior art or at least in PW1, then a court must determine whether a particular doctor could have reduced the benefit that he obtained from the patented technology without having to abandon a valued PW1 privilege. This question in turn needs to be divided into two sub-questions that address roughly the defendant's conduct or state of mind before and after the act of thinking. First, did the doctor value the PW1 privilege at all? This is a question of ex-ante intent in the sense of motivation for willingness to pay. If a vitamin specialist is indifferent to a patient's vascular health when he orders the homocysteine test, then the doctor is an infringer.[196] Second, did the doctor take any steps to benefit from the patent entitlement that were not necessary to enjoy those valued PW1 privileges? If a doctor orders a homocysteine test ex ante for the purpose of assessing a patient's vascular health and then expressly delivers a diagnosis of a Vitamin B12 deficiency to his patient, the doctor infringes claim 13.[197] He can reduce the benefit that he obtains from the patented act of correlating without facing costs other than the opportunity cost of practicing the PW1 art.

CONCLUSION

This article makes the same argument on two, nested levels of generality. At the higher level of generality, it argues that courts should not equate strict liability with

[196] If a doctor has mixed motives, then the constructive nonvolition analysis may differ depending upon whether economic or constitutional overbreadth is at issue. *See supra* notes 158, 163.

[197] Similarly, if a doctor orders a homocysteine test with the intent of assessing a patient's vascular health but then medicates his patient with Vitamin B12, the doctor is an infringer unless the treatment of poor vascular health with Vitamin B12 is a practice that exists in PW1 even though the correlation between homocysteine and Vitamin B12 is not known.

absolute liability in patent cases and that constructive nonvolition should provide an exemption to a patent infringement cause of action. It pulls together the previously unconnected cases of *SmithKline Beecham v. Apotex* and *Monsanto v. Schmeiser* as well as a number of hypotheticals to explain and illustrate the concept of constructive nonvolition. It offers the following definition: If a defendant must abandon privileges that he values in either the prior art or a possible world in which the patented technology had never been invented in order to reduce the benefit that he receives from the patented technology, then the defendant's appropriation of the patent entitlement is constructively nonvolitional. Constructive nonvolition identifies an unusual type of violation of the reward and baseline principles that is not visible on the radar screens of courts using only the traditional invalidity doctrines to search for overbroad claims. It focuses on the unjustifiable restriction of a hypothetical, non-appropriating defendant's options, and argues that the absence of sufficient liberty or choice in those options can justify a defendant's appropriation of an otherwise valid patent entitlement. The exempted defendants need not be truly nonvolitional actors who lack any control over their actions.[198] They need only to have their options limited in a manner that makes their status as infringers under patent law unjustifiable and that transforms their deliberate appropriation of patented technology (or deliberate creation the conditions under which appropriation may occur) into conduct that courts should treat as the legal equivalent of a nonvolitional act.

This article then applies its newly minted concept to a specific class of routinely issued claims that raise the constructive-nonvolition issue on a scale previously unseen in

[198] *See supra* text accompanying notes 70-77 (presenting the traditional nonvolitional act exception to strict liability in criminal law and trespass).

patent law: claims that propertize reflexive thought. It initially picks the easy fight. Claims to free-standing, reflexive acts of thinking create entitlements to others' involuntary conduct, and the need at least for a constructive-nonvolition exemption to strict liability in cases involving these claims is more or less self-evident. It then examines "test and correlate" claims like claim 13 of the '658 patent—the claim at issue in the recent Supreme Court case *Laboratory Corp. v. Metabolite Laboratories*—that describe entitlements to the performance of a deliberate data-gathering step that has been irrevocably bundled with an inventive, reflexive act of thinking. It argues that claims to irrevocable bundles, too, grant patentees rights that are overbroad unless courts recognize a constructive-nonvolition exemption from strict liability. It illustrates that the overbreadth that results from imposing *per se* liability and overlooking constructive nonvolition has both economic and constitutional dimensions.

This article has focused primarily on debunking the equation of strict liability and absolute liability and identifying the circumstances under which constructively nonvolitional appropriation of a patent entitlement occurs. In conclusion, however, two observations about the appropriate doctrinal fix for the problem of constructive nonvolition in cases involving reflexive thought-propertizing claims are appropriate.

First, the Federal Circuit and the PTO should consider implementing a *per se* bar on any method claim that can be routinely appropriated by the performance of an involuntary act. Case-by-case examination of a non-frivolous, constructive nonvolition defense is required in all patent infringement suits because any patent entitlement may be appropriated in a constructively nonvolitional manner under exceptional circumstances. However, if the final and inventive step of a method describes a type of conduct that is

routinely performed in an involuntary fashion, the likelihood of a court having to address a constructive nonvolition defense increases by several orders of magnitude. To reduce the high cost of a case-by-case examination of constructive nonvolition,[199] it may make sense to cut the problem off at the pass and invalidate a distinct group of claims if they entail an unusually high probability of non-frivolous, constructive nonvolition defenses.

Second, even if reflexive thought-propertizing claims that can be routinely appropriated by an involuntary act are held to be invalid, this resolution of the constructive nonvolition problem should not be confused with a resolution of the problem posed by the propertization of thought more broadly. Some thought-propertizing claims are more purposive than reflexive,[200] and the patentability of these claims need not be altered to preempt large-scale constructive nonvolition defenses. Furthermore, many reflexive thought-propertizing claims may be readily altered with only a small reduction in scope to prevent routine appropriation by involuntary acts. For example, thought-propertizing claims could be transformed into speech-propertizing claims. Routine appropriation of claim 13 of the '658 patent by an involuntary act could be eliminated merely by adding a third step to the method such as "informing the patient of a Vitamin B12 deficiency."[201] The inclusion of a token, post-thought deliberate act that expresses the conclusion of the specifically claimed and invented reflexive act of thinking means that the involuntary performance of the reflexive act of thinking itself does not result in the appropriation of the claimed entitlement.[202] The proceedings in *Laboratory Corp.*

---

[199] *See supra* notes 194-199 and accompanying text (elaborating on the difficulty of distinguishing infringing doctors from constructively nonvolitional doctors in *Laboratory Corp.*).
[200] *See supra* notes 98-114.
[201] *See supra* note 197 and accompanying text (discussing the role of post-thinking conduct in the identification of constructive nonvolition).
[202] The inclusion of any post-thinking, deliberate step is insufficient. The step must be limited to expressing or acting on the conclusion reached through the act of thinking. If a third step such as "walking

demonstrate that reflexive thought-propertizing claims create problems that the courts have yet to address in an adequate fashion. However, neither of the potential responses to these problems—the implementation of a constructive-nonvolition exemption to strict liability and the invalidation of thought-propertizing claims that are likely to be performed involuntarily—may be anything other than a speed bump on the road to the widespread propertization of thought.

---

out of the office" were added to the *Laboratory Corp.* claim, it would not eliminate the constructive nonvolition problem.