SMART PATENTS

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Intellectual property ("IP") rights differ from traditional property rights in a crucial respect: the ascertainability of their boundaries. While it is usually a simple task to figure out where a traditional property right (e.g., an ownership right in a piece of land) begins and ends, delineating the metes and bounds of an IP right (e.g., a right to exclude others from practicing an invention as described in a patent claim) can be much more difficult to do.

The indeterminate scope of patent rights in particular leads to many layers of inefficiency. Downstream inventors may find it necessary to engage in costly defensive litigation to determine whether their activities infringe preexisting rights or may be chilled by the prospect of offensive litigation from engaging in these activities altogether. Uncertain patent scope also facilitates trolling behaviors: legitimate practicing entities pay rents to patent trolls because they do not know—and are unwilling to engage in expensive litigation to find out—whether their activities are infringing. As patent scholars have pointed out, these problems of indeterminacy are exacerbated both by ambiguities in the patent claiming process itself and by gaming behaviors among patent owners.

In this Article, I propose a simple set of interventions to help combat problems of ambiguous patent claiming, overreaching, and strategic behavior by patent owners. My solution calls for targeted changes to the patent application process. The suggestions for change draw from similar recommendations, grounded in the social psychology literature, that have called for the creation of so-called "smart" tax returns in the tax filing context.

The changes proposed here have several advantages over other recommendations designed to enhance patent clarity. First, they are relatively low-cost. Second, they are self-sustaining, requiring no ongoing policing or oversight. Finally, the changes proposed here need not be mutually exclusive from the implementation of any other suggestion for improving patent clarity and fighting strategic behavior previously made in the literature. Indeed, the hope is that the recommendations I put forth here can work

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in concert with other policy interventions to reduce undesirable patent claiming behaviors and attendant inefficiencies, while enhancing the clarity of patent boundaries.

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I. INTRODUCTION

Imagine the following scenario: you're working late at your office trying to finish up an important project. Tired, hungry, and looking for a distraction, you wander to the kitchen to get a drink. On the counter you see a platter of chocolate cake, with one slice remaining. Assuming whoever placed the cake in

the kitchen meant to make it publicly available, you take the last slice back to your office and happily devour it.

Unfortunately, you assumed incorrectly. The person who put the cake in the kitchen was saving that last slice for a colleague. Even worse, it is that colleague's birthday and you, inadvertently, ate his birthday cake.

At a team meeting the next day, all anyone can talk about is the missing birthday cake. Who ate it? You, the culprit, understandably feel uncomfortable and are torn about whether to confess. In reality, you're hoping that everyone just forgets about it and moves on.

Now imagine that one of the following two interactions with a colleague takes place. Think about how you might respond in each scenario.

Interaction 1:

Colleague: Can you believe this business about the cake?

I wonder who did it?

You: . . .

Interaction 2:

Colleague: Did you eat the last slice of cake?

You: . . .

Did you imagine yourself responding differently in Interaction 1 than in Interaction 2? Would it be easier, in Interaction 1, to mumble something noncommittal and quickly change the subject than it would be, in Interaction 2, to directly lie and say that no, you did not eat the cake?

If you think that it would in fact be easier to hide your transgression in Interaction 1, you're not alone. Social psychologists and neuroscientists have found that lying is cognitively difficult[1] and that the difficulty increases with the explicitness of the lie.[2] Direct questions, like the one posed by your hypothetical colleague in Interaction 2, make it more difficult for people to lie because it forces them to lie explicitly and by commission—a challenging task most would prefer to avoid.[3] In scenarios like Interaction 1, by contrast, it is easier for people

1. *See, e.g.*, Vincent van Veen, Marie K. Krug, Jonathan W. Schooler & Cameron S. Carter, *Neural Activity Predicts Attitude Change in Cognitive Dissonance*, 12 NATURE NEUROSCIENCE 1469, 1472–73 (2009) (finding that additional brain regions are necessary to tell a lie and that activation of these regions predicts an attitude change that resolves the uncomfortable sensation of "cognitive dissonance" subjects experience when lying); Victor A. Gombos, *The Cognition of Deception: The Role of Executive Processes in Producing Lies*, 132 GENETIC, SOC. & GEN. PSYCHOL. MONOGRAPHS 197, 197, 199 (2006) (stating that "[d]eception is a difficult task" and surveying research detailing the "increased cognitive effort associated with a lie") (alteration in original).

2. *See, e.g.*, Robert Trivers, *Deceit and Self-Deception*, *in* MIND THE GAP: TRACING THE ORIGINS OF HUM. UNIVERSALS 373, 383 (Peter M. Kappeler & Joan B. Silk eds., Springer 2009) (explaining how the "fully conscious effort to lie" imposes a greater cognitive load than attempts at deception that can be rationalized away).

3. *See, e.g.*, Maurice E. Schweitzer & Rachel Croson, *Curtailing Deception: The Impact of Direct Questions on Lies and Omissions*, 10 INT'L J. CONFLICT MGMT. 225, 231 (finding that "subjects were less likely to lie when asked a direct question").

to rationalize that they are not really lying because they are not forced to respond with a clear falsehood to a direct question.[4]

But what does an interesting insight about direct questions and lying have to do with patent law, or any area of the law, for that matter? The answer is that these and other similar revelations by social psychologists are extremely useful for situations in which policymakers want people to be more honest. For example, tax law scholars have proposed that these insights could be used to increase honesty on tax returns and save the government billions of dollars.[5]

Here, I deploy these psychological insights to a different, but no less urgent, end: improving the accuracy and determinacy of patent claims. The scope of intellectual property ("IP") rights, and patent rights in particular, is notoriously indeterminate,[6] and this indeterminacy leads to inefficiency.[7] Downstream inventors may need to pursue costly legal avenues, including freedom to operate analyses or even defensive litigation,[8] to determine whether their innovative activities infringe others' rights; or they might be chilled by the prospect of an infringement action from engaging in these activities at all.[9] Unclear patent scope also allows patent trolls to flourish, as legitimate practicing entities would often prefer to pay rents to trolls than incur the time and expense of litigation to determine whether their activities infringe a vague and broad patent.[10]

4. *See* Trivers, *supra* note 2, at 383 (explaining how self-deception and rationalization help relieve the cognitive load associated with lying).

5. Joseph Bankman, Clifford Nass & Joel Slemrod, *Using the "Smart Return" to Reduce Tax Evasion and Simplify Tax Filing*, 69 N.Y.U. TAX L. REV. 459, 459–60 (2016).

6. *See, e.g.*, Tun-Jen Chiang & Lawrence B. Solum, *The Interpretation-Construction Distinction in Patent Law*, 123 YALE L.J. 530, 533 (2013) ("The uncertainty over how courts will apply patent claims in adjudicating infringement is a real and very substantial problem in patent law today."); David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 259–60 (2008) (discussing the indeterminacy of patent claim construction in the context of an empirical study demonstrating high reversal rates by the Federal Circuit of district court claim constructions); Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1756 (2009) (describing the "acute" indeterminacy of patent claim construction); Alan Devlin, *Indeterminism and the Property-Patent Equation*, 28 YALE L. & POL'Y REV. 61, 70–71 (2009) (discussing the problems raised by "nebulous patent claims of indeterminate scope and validity").

7. *See, e.g.*, Chiang & Solum, *supra* note 6, at 581 (noting that it is "economically inefficient" to award a patentee a greater scope of rights than what she has invented); Burk & Lemley, *supra* note 6, at 1749 (describing how the indeterminacy of patent claims could lead to inefficiencies in licensing transactions).

8. *See, e.g.*, Chester S. Chuang, *Unjust Patents & Bargaining Breakdown: When is Declaratory Relief Needed?*, 64 SMU L. REV. 895, 898 (2011) ("When unjust patents are asserted against potential infringers, their indeterminate boundaries prevent parties from reaching mutually agreeable solutions because the parties deadlock over mutually mistaken assumptions regarding the patents' scope and value. This bargaining breakdown often leads to litigation and a request for declaratory relief.").

9. *See, e.g.*, Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1079 (2003) (explaining how "uncertain patent rights either chill legitimate inventive activity or force competitors to engage in costly information gathering and/or litigation to assess the validity of the patent right"); Thomas Chen, *Patent Claim Construction: An Appeal for* Chevron *Deference*, 94 VA. L. REV. 1165, 1191 (2008) (referring to "the chilling effect of ambiguous patent[s]").

10. *See, e.g.*, Gregory Mandel, *The Non-Obvious Problem: How the Indeterminate Nonobviousness Standard Produces Excessive Patent Grants*, 42 U.C. DAVIS L. REV. 57, 128 (2008) (explaining how "patent trolls . . . leverage uncertainty . . . to reap rewards" because "the alleged infringing firm cannot be certain to escape liability, and therefore will be willing to pay a higher settlement payout than if it could be reasonably certain of defeating the patent on obvious subject matter"); *In re* Packard, 751 F.3d 1307, 1325 (Fed. Cir. 2014) (Plager, J.,

Indeterminacy is to some extent an inherent feature of patent claiming, given ambiguities in language itself[11] and patenting's so-called "sequence of information" problem.[12] But gaming behaviors—chief among these, overclaiming, or laying claim to more than what an inventor has actually invented—are also a huge source of unclear patent scope and the inefficiencies that inevitably result.[13]

To this end, IP scholars have proposed a number of interventions to address inefficient strategizing and overclaiming on the part of patent holders. Many of these proposals are designed to be implemented either at the U.S. Patent and Trademark Office ("PTO")—where patent applications are reviewed, during the initial prosecution (*i.e.*, application) process or potential subsequent *inter partes* review ("IPR")[14]—or during the litigation process when patent owners attempt to enforce their patents against alleged infringers.[15]

concurring) (explaining how the uncertainty of patent scope "encourages the kinds of litigation that have made 'patent trolls' dirty words").

11. *See, e.g.*, Devlin, *supra* note 6, at 77 (explaining that patent law's indeterminacy problem "derives from the limitations of language"); Chiang & Solum, *supra* note 6, at 533 ("The common premise of th[e existing] literature is that the uncertainty [in determining patent boundaries] arises because claim language is itself uncertain"); Burk & Lemley, *supra* note 6, at 1753 (asserting that "litigators can and will find ambiguity in claim language," and further, that "[l]anguage . . . doesn't have 'a' plain meaning"). *But see* Chiang & Solum, *supra* note 6, at 534 (arguing that the uncertainty of patent scope arises not from inherent ambiguities in language but instead "because judges have core policy disagreements about the underlying goals of claim construction").

12. Janet Freilich, *The Uninformed Topography of Patent Scope*, 19 STAN. TECH. L. REV. 150, 162 (2015) (arguing that indeterminate patent boundaries arise in part from a "sequence-of-information problem" because while patent scope "is set before patent grant," "almost all potentially infringing products will be conceived of or developed after the patent is granted." Thus, "[s]cope is set early in the life of a patent, while the information necessary to define the scope of a patent is created much later.").

13. *See, e.g.*, JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE 66–67, 213 (2008); Mark A. Lemley & Mark P. McKenna, *Scope*, 57 WM. & MARY L. REV. 2197, 2284 (2016) (discussing proposals to address the mischiefs associated with overclaiming); Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1170–71 (2002) (explaining how the PHOSITA standard for software patents leads to more inefficient overclaiming in this field); Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 WIS. L. REV. 905, 963 (2013) (arguing that the current patent system allows for overclaiming in software patents, which in turn leads to inefficient behaviors like patent hold up); John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 GEO. L.J. 677, 707 (2011) (finding that repeat patent litigants tend to fare poorly in court, and suggesting that this might be a result of these patentees either claiming more than they invented or overreading their claims); Tun-Jen Chiang, *Forcing Patent Claims*, 113 MICH. L. REV. 513, 522 (2015) ("Once we consider a rational, self-interested patentee's actual incentives, it becomes obvious that patent claims are unlikely to describe the real invention. Rather, patentees will draft claims to cover as much as they can possibly get away with.").

14. *See, e.g.*, Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. L. REV. 1495, 1508 & n.56 (2001) (collecting references); Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 73–78, 93–101 (2004) (arguing that the PTO process of continuations should be reformed in part because it encourages bad patents to get through the PTO); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L. J. 763, 770–76 (2002) (suggesting a number of ways to combat strategizing by patentees at the PTO, including changing prior art disclosure rules and eliminating the statutory presumption of validity if the patentee does not comply with these rules); R. Polk Wagner, *Understanding Patent Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2165–68 (2009) (suggesting that the PTO engage in claim construction to set patent scope early on).

15. *See, e.g.*, Lemley & McKenna, *supra* note 13, at 2266–68 (suggesting that "[c]ourts . . . coordinate validity, infringement, and defense proceedings in some way [to clarify patent scope] so that both the fact of overreaching and its potential consequences become clear to the parties and the court before trial").

Surprisingly, however, fewer solutions to the patent gaming problem focus on an even earlier stage of the patenting process: when patent claims are first drafted by inventors and their agents or attorneys.[16] This is notable, because in many ways, dealing with strategic behavior at this early stage makes the most sense. Ensuring that patent claims are not overbroad before they even make it to the patent office preserves scarce PTO resources[17] and prevents the costly chilling effects and legal fees incurred if these patents actually issue.[18] In other words, it is much more efficient to deal with strategic behaviors before they even occur. As the old adage goes, an ounce of prevention is worth a pound of cure.

But if this is true, why haven't more scholars thought about what can be done to prevent gaming at the drafting stage? The most likely reason is that it can be difficult to imagine how policymakers might do so. How do policymakers convince patent owners, whose potential for economic returns grow (sometimes exponentially) as claim scope expands, not to try to claim as broadly as possible?[19] And what about their attorneys and agents? Can policymakers rightly tell them that the efficiency of the patent system is more important than the personal interests of those they represent? This seems directly at odds with attorneys' duty to zealously advocate on behalf of their clients.[20]

This is where insights from the social psychology literature on honesty can help. Targeted changes to the patent application process will help combat problems of ambiguous patent claiming, overreaching, and strategic behavior by inventors and their representatives and result in clearer, more honest, and consequently more efficient claims. Compared to other proposals, this approach has many advantages.

16. Three notable exceptions stand out in this respect. Harry Surden has proposed a number of patent drafting innovations to help clarify claim scope, including requiring a patentee to act as his own lexicographer, imposing enhanced disclosure conditions on patentees, forcing patentees to "internalize" their external disclosures, and requiring them to clarify ambiguous terms up front. Harry Surden, *Efficient Uncertainty in Patent Interpretation*, 68 WASH. & LEE L. REV. 1737, 1809–20 (2011). Janet Frielich and Jay Kesan suggest that patent language be standardized so that a given word can be understood to mean the same thing across patents. Janet Freilich & Jay P. Kesan, *Towards Patent Standardization*, 30 HARV. J.L. & TECH. 233, 255 (2017). And Oskar Liivak has recently suggested that the oath inventors must sign when submitting patent applications, certifying that they have actually invented the claimed subject matter, be used to threaten criminal sanctions for inventors who overclaim. Oskar Liivak, *Overclaiming is Criminal*, 49 ARIZ. STATE L.J. 1417, 1422 (2017).

17. *See* Lemley, *supra* note 14, at 1496–97 (arguing that it is inefficient for the PTO to spend extensive resources weeding out bad patents when many of those patents do not end up being litigated).

18. *See* Rai, *supra* note 9, at 1079.

19. Those who have proposed drafting-stage solutions to overclaiming have gotten around this problem in various ways. Surden's solution imposes requirements on patentees at the drafting stage and denies patent protection to those who don't follow them. *See* Surden, *supra* note 16, at 1809–20. Freilich and Kesan's call for increased standardization suggests a number of possible approaches, including private ordering solutions and enhanced standardization of the patent application itself through templates and drop-down menus. Freilich & Kesan, *supra* note 16, at 250–55. And Liivak uses the threat of criminal sanctions to convince patentees and their agents that claiming more honestly is in their best interests. Liivak, *supra* note 16, at 1420–22. Rather than forcing or threatening patentees on the one hand, or relying on private ordering on the other, my proposal uses psychological "nudges" to encourage more honest claiming.

20. *See, e.g.*, Howard M. Erichson, *Settlement in the Absence of Anticipated Adjudication*, 85 FORDHAM L. REV. 2017, 2017 (2017) (stating that "[t]he lawyer owes an affirmative duty to advocate for the client's objectives" and arguing that "the litigator's role" is one of "zealous advocacy").

Already alluded to, for example, are the efficiencies gained by fighting strategic behaviors in the moment they are likely to occur. The costs associated with these proposals are low. And once implemented, the approach is self-sustaining, with no need to hire bodies at the PTO to police bad behaviors. Preventing strategic behavior early on will also lower the costs that arise when unclear and overbroad patents are not dealt with until the IPR or litigation stage, like the costs society incurs when an improperly drafted patent suppresses legitimate uses of a technology or scarce government resources are devoted to invalidating these patents in court or at the patent office.[21]

But the best feature of this proposal is that it need not be mutually exclusive from any other suggestion for how to fight strategic claiming behavior previously made in the literature, whether that suggestion involves the litigation stage, the PTO stage, or the drafting stage of the patenting process. Indeed, the hope is that the relatively straightforward recommendations I put forth here can work in concert with other policy interventions to combat strategic patenting behaviors and the inefficiencies that result.

The rest of the Article proceeds in five Parts. In Part II, I explain why the indeterminacy of patent rights is a problem and how undesirable behaviors by inventors and patent owners contribute to this indeterminacy. Part III discusses what it means, precisely, for a patent to be vague and overbroad in the sense of giving rise to these problems. In Part IV, I canvas various solutions IP scholars have put forth to address vague and overbroad patents and examine their strengths and limitations. In Part V, I delve into findings of neuroscientists and social psychologists about honesty. Applying these insights in the patent context, I explain how modifying the patent application process will reduce undesirable patent claiming behaviors and enhance the clarity of patent boundaries. In the final Part, I consider practical challenges to my proposal and offer suggestions for how policymakers might address these challenges.

II. UNCLEAR, OVERBROAD SCOPE AND OPPORTUNISTIC BEHAVIOR

A. Negative Effects of Unclear, Overbroad Scope

As two leading IP scholars have stated, "[s]cope [of IP rights] is *the* critical question that underlies all IP regimes."[22] The reason is intuitive: in order to efficiently administer and enforce IP rights, relevant parties need to have some idea of what those rights are. The scope of an IP right, defined by its boundaries, gives us this idea. It tells us what an IP right covers and does not cover. By extension, it also tells us what activities by others either violate or do not violate that right.

In patent law, the scope of an inventor's rights is determined by reference to a patent's claims.[23] An inventor drafts "one or more claims" that "particularly

21. *See* Rai, *supra* note 9, at 1079.

22. Lemley & McKenna, *supra* note 13, at 2285.

23. *See, e.g.*, Markman v. Westview Instruments, Inc., 517 U.S. 370, 372 (1996); Burk & Lemley, *supra* note 6, at 1749.

point[] out and distinctly claim[] the subject matter which the inventor . . . regards as the invention."[24] Courts use these claims to decide what an inventor may lay valid claim to, and what she can properly exclude others from doing.[25] The claims also provide notice to third parties who plan to engage in similar, potentially infringing, activities.[26]

Unfortunately, inferring the boundaries of a right from a patent's claims is rarely straightforward.[27] Relatedly, many unclear claims have the potential to be read quite broadly.[28] Courts and interested third parties thus often struggle to determine what an issued patent does or does not cover.[29] The struggle has real and detrimental effects on the efficient functioning of the patent system.[30] Though an extensive literature has been devoted to detailing these inefficiencies, I quickly review a few of them here.

1. Defensive litigation

When the boundaries of a patent right are ill-defined or overbroad, third parties who wish to use related technologies may find themselves in a bind. Not knowing whether your intended (or current) use of a technology infringes someone else's patent means living with the uncertain prospect of an expensive lawsuit and a possible injunction hanging over your head.

In the face of this uncertainty, a common approach is to go to court seeking a declaratory judgment that your intended use does not infringe the patent in question—or alternatively, that the patent is invalid.[31] Though this approach is

24. 35 U.S.C. § 112(b).

25. Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 840 (1990) ("[T]he courts are constantly making patent scope decisions . . . in litigation, where questions of patent infringement are decided."); John F. Duffy, *On Improving the Legal Process of Claim Interpretation: Administrative Alternatives*, 2 WASH. U. J.L. & POL'Y 109, 109 (2000) (explaining that during the 19th century, "[t]he patent claim evolved . . . and assumed its place as the central textual definition of the rights conferred by the patent").

26. *See e.g.*, Matthew J. Congliaro, Andrew C. Greenberg & Mark A. Lemley, *Foreseeability in Patent Law*, 16 BERKELEY TECH L.J. 1045, 1047 (defining the "notice function of patents" as the ability of "the public . . . to determine the scope of a patent ex ante").

27. *See, e.g.*, Burk & Lemley, *supra* note 6, at 1745 ("Claim construction is sufficiently uncertain that many parties don't settle a case until after the court has construed the claims, because there is no baseline for agreement on what the patent might possibly cover. Even after claim construction, the meaning of the claims remains uncertain, not only because of the very real prospect of reversal on appeal but also because lawyers immediately begin fighting about the meaning of the words used to construe the words of the claims.").

28. *See, e.g.*, Alan C. Marco, Joshua D. Sarnoff & Charles A. deGrazia, *Patent Claims and Patent Scope*, 2 (USPTO Econ., Working Paper No. 2016-04) (2016) (explaining how "[s]oftware patents in particular have been criticized for having unduly broad and/or unclear claims"); Chiang & Solum, *supra* note 6, at 551 ("In the patent context, intentional ambiguity can occur when patent applicants seek to convey a narrow meaning to the patent examiner while conveying a broader meaning to potential competitors.").

29. *See, e.g.*, Marco et al., *supra* note 28, at 2; Merges & Nelson, *supra* note 25, at 841–42; Chiang & Solum, *supra* note 6, at 533 ("The uncertainty over how courts will apply patent claims in adjudicating infringement is a real and very substantial problem in patent law today."); Schwartz, *supra* note 6, at 259–60 (showing high reversal rates of district court claim constructions by the Federal Circuit).

30. *See, e.g.*, Chiang & Solum, *supra* note 6, at 533.

31. *See, e.g.*, Chuang, *supra* note 8, at 898 (explaining how "indeterminate [patent] boundaries . . . often lead[] to litigation and a request for declaratory relief"); Rai, *supra* note 9, at 1079 (explaining how "uncertain

in many ways a rational response to the indeterminacy of patent boundaries, it is also an expensive way to figure out what a patent covers.[32] And the expense accrues not only to the parties in suit, but also to society more broadly, which largely foots the bill for the judges, courthouses, and other resources civil litigants use.[33] It would certainly be much more efficient if interested third parties could determine *ex ante* whether the technology they wished to develop or use was covered by a valid patent.

Fortunately, the legislative innovation of new administrative review procedures introduced by 2013's America Invents Act ("AIA") has mitigated the concern of costly defensive litigation somewhat.[34] These new post-grant review ("PGR") and IPR[35] proceedings allow parties concerned about the scope or content of an issued patent to challenge the patent's validity at the PTO rather than in court.[36] A PGR proceeding can be requested by a third party within nine months of a patent's issuance and can be used to challenge the validity of the patent on any statutory ground (including lack of utility, lack of novelty, obviousness, lack of enablement, indefiniteness, or inadequate written description).[37] Designed to be instituted after the time window for filing a petition for PGR has passed, an IPR can be requested by a third party beginning nine months after a patent's issuance.[38] Unlike PGRs however, IPR challenges to a patent's validity can be based only on novelty or obviousness grounds, and those only when the prior art giving rise to the challenge is a printed publication.[39]

Scholars have hailed these administrative proceedings as important tools for eliminating unclear and overbroad patent claims.[40] And from the perspective

patent rights" often "force competitors to engage in costly information gathering and/or litigation to assess the validity of the patent right").

32. *See* Shawn P. Miller, *What's the Connection Between Repeat Litigation and Patent Quality? A (Partial) Defense of the Most Litigated Patents*, 16 STAN. TECH. L. REV. 313, 317 (2013) ("Patent litigation is notoriously expensive."). *But see* Lemley, *supra* note 14, at 1501, 1513–14 (noting that "[o]f the roughly two million patents . . . in force [as of the time of writing], only a tiny number are the basis for lawsuits each year," and arguing that it is more efficient to litigate this small number of patents than it is to spend additional resources weeding out unclear and overbroad patents at the PTO).

33. Lemley, *supra* note 14, at 1502.

34. *See* 35 U.S.C. § 321.

35. The AIA also added a special review proceeding for business method patents, known formally as the transitional program for covered business methods (or CBM for short). The legislation instituting CBM review included a sunset provision which took effect on September 16, 2020, thereby eliminating this proceeding as an option for patent challengers. *See, e.g.*, Dennis Crouch, *Covered Business Method Review: Last Day to File is September 16, 2020*, PATENTLY-O (Aug. 10, 2020), https://patentlyo.com/patent/2020/08/covered-business-september.html [https://perma.cc/LG6W-VT79].

36. *See* Rochelle Cooper Dreyfuss, *Giving the Federal Circuit a Run for its Money: Challenging Patents in the PTAB*, 91 NOTRE DAME L. REV. 235, 235–36 (2015).

37. *Id.* at 245.

38. *Id.*

39. *Id.* at 246–47.

40. Weeding out weak and overbroad patents, was, in fact, a primary legislative motivation for instituting these procedures. *See, e.g.*, *Protecting Small Businesses and Promoting Innovation by Limiting Patent Troll Abuse, Hearing on S 23 before the U.S. Comm. on the Judiciary*, 113th Cong., 1st Sess., 43–46, 48 (2013) ("2013 Patent Troll Abuse Hearing") (statement of Q. Todd Dickinson, Executive Director of the American Intellectual Property Law Association).

of innovators and users seeking freedom to operate, these proceedings may be superior to full blown litigation in many ways. For one thing, they are less expensive.[41] Invalidity is also considered under a preponderance of evidence standard (more likely than not that a claim is invalid), rather than the higher, clear and convincing evidence standard used in court.[42]

Consistent with these benefits, patent challengers have taken due advantage of the opportunities to avoid defensive litigation. An early study by Brian Love and Shawn Ambwani, for example, found that patent challengers immediately recognized the potential value of these proceedings, filing petitions for IPRs at a rate six times that of the IPR's predecessor proceeding as of September 2014.[43] The popularity of IPRs has continued in the intervening years.[44]

IPRs and PGRs do not eliminate the concern of expensive and wasteful expenditure of resources triggered by unclear and overbroad patents, however.

41. *See, e.g.*, Dreyfuss, *supra* note 36, at 239; Brian J. Love & Shawn Ambwani, Inter Partes *Review: An Early Look at the Numbers*, 81 U. CHI. DIALOGUE 93, 96 (2014) (referring to legislators' hopes that IPRs would become a "cheap, efficient litigation alternative").

42. *See* 35 U.S.C. §§ 316(e), 326(e).

43. Love & Ambwani, *supra* note 41, at 97. *See also* Dreyfuss, *supra* note 36, at 249 (reporting on the Love and Ambwani study and stating that "the numbers speak volumes . . . IPRs . . . have proven extremely popular").

44. *See, e.g.*, Gene Lee & Danielle Grant-Keane, *5 Thoughts On 5 Years Of* Inter Partes *Review*, LAW360 (Sept. 15, 2017, 4:52 PM), https://www.law360.com/articles/963232/print?section=ip [https://perma.cc/Z8KB-TJ5H] (stating (in 2017) that "IPRs are being filed at a rate of well over 1,500 per year, making the Patent Trial and Appeal Board the most popular venue for litigating patent disputes"). PGRs, in contrast, have proven less popular for a number of reasons. Because PGR review was made available only for patents filed on or after the date the AIA went into effect, it took some time before there was a substantial number of patents available to be challenged in this way. *See, e.g.*, Colleen Chien, Christian Helmers & Alfred Spigarelli, *Inter Partes Review and the Design of Post Grant Reviews*, 33 BERKELEY TECH. L.J. 817, 828 (2018) ("Because PGR is currently available only for patents with an effective filing date (priority) on or after March 16, 2013, and it takes several years for a patent to be granted, uptake of PGR proceedings so far has been limited."). Many experts predicted that the use of PGRs would grow over time as more patents susceptible to PGR were issued. *See, e.g.*, Jeffrey A. Miller, Katie J.L. Scott & Bonnie Phan, *Post Grant Review: A Promising New Tool for Invalidating Patents?*, ARNOLD & PORTER (Jan. 18, 2017), https://www.arnoldporter.com/en/perspectives/publications/2017/01/post-grant-review-a-promising [https://perma.cc/RC8X-99K8]. While this has been true to some extent, the popularity of PGRs has still failed to match that of IPRs, likely because of the relatively smaller pool of patents available for PGR challenge, and also perhaps in part because of the short time window (within nine months of a patent's issuance) for filing PGR petitions and the comparatively narrower reach of estoppel for IPRs. *See, e.g.*, Daniel C. Cooley, Joshua L. Goldberg & Daniel F. Klodowski, *PTAB Basics: The Key Features of Trials Before the USPTO*, IP LITIGATOR (Jan/Feb. 2020), https://www.finnegan.com/en/insights/articles/ptab-basics-key-features-of-trials-before-the-uspto.html [https://perma.cc/8UCY-TFZB].

The value of IPRs in curtailing some of the ill effects of unclear and overbroad claims might also be evidenced by the strength and content of the opposition to them. Patent owners have complained that IPRs significantly diminish the value of their property rights and add additional time consuming and expensive challenges to their issued patents that diminish certainty. *See, e.g.*, Lee & Grant-Keane, *supra* note 44 ("Patent owners have been vocal in asserting that IPRs and other PTAB trials have unduly compromised their property rights and added costs and delays in many patent litigations."); Robert Stoll, *A Review at Five Years of Inter Partes Review*, IP WATCHDOG (Sept. 12, 2017, 11:45 AM), https://www.ipwatchdog.com/2017/09/12/five-years-inter-partes-review/id=87424/# [https://perma.cc/XHZ4-CT99] (stating that IPRs are "frequently providing additional challenges to issued patents, causing patent owners to defend their issued patents in different venues"). In 2018 this debate came to a head when IPRs faced an existential challenge at the Supreme Court based on their alleged unconstitutionality. Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC, 238 S. Ct. 1365, 1370 (2018). The proceedings survived this challenge intact and continue to play an important role in the patent system.

Although these proceedings are considerably cheaper and more efficient than litigation, they still entail significant costs to the parties undertaking them.[45] Further, the institution of an IPR or PGR by the PTO does not guarantee that litigation will not occur.[46] Although a court may choose to stay litigation proceedings until the resolution of the administrative procedure, it is not bound to do so.[47] And though IPRs and PGRs carry with them broad estoppel provisions that prevent rehashing the same issues in court,[48] there may still be plenty left to litigate after the proceedings conclude, especially in the case of IPRs, with their limitation to questions involving the prior art.[49] The fundamental concerns about defensive litigation raised by unclear and overbroad patents thus remain even in a post-AIA world, though the statute has succeeded in addressing them to some extent.

2. Chilling

The prospect of innovators spending significant personal and public resources to determine whether they can proceed with their desired use or development of an invention is reason enough to worry about unclear and overbroad patents. But perhaps even more concerning is the possibility that these innovators will choose not to engage in their preferred course of activity at all due to risk aversion, an unwillingness to pay supra-competitive prices for a license, or the fact that it is simply too difficult or expensive to obtain definitive answers about their freedom to operate.[50] If a patent is drafted in such a way as to apparently cover ground the patentee did not actually invent, competitors and others may refrain from engaging in legitimate activities for fear of infringing the overbroad patent.[51] This chilling effect imposes real costs on society, stymieing growth-producing innovation and increasing the deadweight losses incurred by these patents.[52] And because chilling primarily involves actors who are unwilling or unable to take the steps necessary to obtain certainty about the scope of an issued patent, *ex post* solutions to unclear and overbroad patents that occur at the

45. *See* Lee & Grant-Keane, *supra* note 44 (citing a 2015 study by the American Intellectual Property Law Association finding that "the median cost of pursuing *inter partes* review was $275,000, with some petitions reaching a total cost of $600,000").

46. *See, e.g.*, Paul R. Gugliuzza, *(In)Valid Patents*, 92 NOTRE DAME L. REV. 271, 278–87 (2016) (describing litigation and post grant review procedures and how they interact).

47. *Id.* at 273.

48. Dreyfuss, *supra* note 36, at 246–47 (explaining how for PGRs, "the petitioner, its privies, and real party in interest are estopped from raising before the PTO, in a civil action . . . an issue that was raised or reasonably could have been raised in the PGR . . . [E]stoppel for the patent holder [in IPRs] is the same as for PGRs").

49. *Id.* at 247 ("As the only grounds that can be raised in the IPR are novelty and nonobviousness based on a narrow range of prior art, there are many grounds on which the identical claims can be challenged in court [even given the estoppel provisions]."); Gugliuzza, *supra* note 46, at 283–84 ("Although a petitioner in inter partes review is estopped from asserting in later litigation any ground for invalidity it could have raised at the PTO, the only invalidity arguments the petitioner may assert in inter partes review are anticipation and obviousness, meaning that estoppel is less of a deterrent than it is in post-grant review.").

50. Rai, *supra* note 9, at 1081.

51. *Id.* at 1079.

52. *Id.*

litigation stage will likely be less helpful in addressing this particular harm than earlier interventions.[53]

3. Licensing inefficiencies

When a party encounters a patent that potentially stands in the way of their business plans, they may, as discussed, engage in defensive litigation or an administrative process to try and invalidate the patent. Or they may be chilled and decide not to go ahead with their plans at all. Some parties, however, may decide to pursue a license to the patent. This may seem like a relatively straightforward and inexpensive way to deal with the uncertainty in scope that attends patents in general and broad patents in particular. Unfortunately, however, unclear and overbroad patents can lead to inefficiencies within this process as well.

Licensing negotiations inevitably entail transaction costs, as parties work to come to an agreement about how much a patented technology is worth. But when a patent is broad it can increase these transaction costs.[54] Overbroad patents increase the likelihood that there will be disagreement between the parties about what the patent covers.[55] And as Dan Burk and Mark Lemley argue, "if a competitor thinks that a patent means one thing and the patentee thinks it means something different, they are unlikely to be able to conclude a licensing transaction efficiently."[56] Arti Rai also makes the point that when large numbers of broad patents are granted on relatively trivial inventions, this multiplies the transaction costs for downstream researchers.[57] In some cases, these increased transaction costs could become prohibitive,[58] leading to chilling or the problematic options of administrative review or defensive litigation. Overbroad patents also facilitate the opportunistic licensing practice of patent trolling.

4. Trolling

Much has been written in the past two decades about patent trolls and their potential detrimental effects on innovation and society more broadly.[59] The degree to which patent trolls (or, less inflammatorily, non-practicing entities or

53. *See, e.g.*, *id.* at 1079–86 (arguing at length about why early certainty in patent rights is necessary to prevent costly chilling effects); Chen, *supra* note 9, at 1210 (comparing his proposal that trial courts consistently adopt the narrowest reasonable meaning of a claim with patent reform proposals that take place later in the life cycle of a contested patent, and arguing that his proposal more effectively addresses chilling concern because it "operates much farther upstream, providing a more efficient delivery of early certainty and accuracy").

54. Burk & Lemley, *supra* note 6, at 1749.

55. *Id.*

56. *Id.*

57. Rai, *supra* note 9, at 1070–71.

58. *Id.*

59. *See, e.g.*, John M. Golden, *"Patent Trolls" and Patent Remedies*, 85 TEX. L. REV. 2111, 2112, 2112 n.7 (2007) (defining a patent troll as "a class of patent owners who do not provide end products or services themselves, but who do demand royalties as a price for authorizing the work of others," but explaining that a strict definition of the term has proven elusive).

patent holding companies[60]) exert a negative influence on the innovation landscape is a question still up for debate.[61] Still, less controversial is the proposition that vague and overbroad patents facilitate the worst aspects of so-called trolling behavior, in which nonpracticing entities leverage dubious patents to extract rents from legitimate innovators.[62] Vague and broad patents raise questions in defendants' minds as to whether their uses infringe, making it more likely that they will pay the rent demanded of the troll rather than risk an unfavorable outcome in costly litigation.[63] This particular scenario is unlikely to lead to any societal benefit,[64] and, to the contrary, entails a significant transfer of public wealth to private entities that provide little in return.[65]

B. Explanations for Unclear, Overbroad Scope

The fallout of uncertain and overbroad patent scope is a potentially devastating blow for the efficient functioning of our patent system. But why is patent scope so hard to get a handle on? Patent law scholars have opined on why this might be the case.

1. Linguistic ambiguity

A well-accepted explanation for indeterminate patent scope is based in the inherent ambiguity of language.[66] Patent scope is defined by a patent's claims, which in turn, are delineated by words. But, as many patent scholars have noted, words are plastic objects with highly contextual meanings subject to differing interpretations by different people.[67] Even under the best of circumstances, then,

60. *See* Edward Lee, *Patent Trolls: Moral Panics, Motions in Limine, and Patent Reform*, 19 STAN. TECH. L. REV. 113, 142 (2015) (presenting the results of an empirical analysis to support his claim that the term "troll" is almost universally used in a negative way and should be barred in patent trials as unfairly prejudicial).

61. *See, e.g.*, Robin C. Feldman & Mark A. Lemley, *The Sound and Fury of Patent Activity*, 103 MINN. L. REV. 1793, 1794 (2019) ("To technology companies, [trolls] are a drag on innovation, taxing them tens of billions of dollars every year while achieving no social purpose. To [trolls] and their supporters, they are enabling the first inventor to get paid and creating a working market for the transfer of technology.").

62. *See, e.g.*, *id.* at 1800 ("[E]vidence suggests NPEs may buy patents with vaguely worded claims that are optimized for litigation but lacking in technical merit."); Grace Heinecke, *Pay the Troll Toll: The Patent Troll Model is Fundamentally at Odds with the Patent System's Goals of Innovation and Competition*, 84 FORDHAM L. REV. 1153, 1176 (2015) (noting that "[p]atent trolls make a business out of capitalizing on th[e] uncertainty" of "vague and overly broad" patents).

63. *See, e.g.*, Heinecke, *supra* note 62, at 1177.

64. *See, e.g.*, Feldman & Lemley, *supra* note 61, at 1796 (finding that "[p]atent licensing demands almost never result in technology transfer or new innovation in the computer industry, particularly when NPEs are doing the asserting"). Feldman and Lemley did find, however, that some industries, like the energy industry, did see new products arise from patent assertions. *Id.* at 1797. *See generally* Clark D. Asay, *Does Innovation Mean Patent Licensing Demands?*, 101 IOWA L. REV. ONLINE 74 (2016) (discussing the limitations of Feldman and Lemley's study).

65. *See, e.g.*, Feldman & Lemley, *supra* note 61, at 1859–60.

66. *See, e.g.*, Peter S. Menell & Michael J. Meurer, *Notice Failure and Notice Externalities*, 5 J. LEGAL ANALYSIS 1, 33.

67. *See id.* ("Patents are defined by the claim language, which can be ambiguous."); Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621, 637–38 (2010) (referring to "the inherent indeterminacy of language"); Burk & Lemley, *supra* note 6, at 1753 (joking that "[l]anguage . . . doesn't have 'a' plain

when interpreters have a common interest in determining the "correct" claim scope, a single precise definition of a claim can be elusive.[68] And of course, these ideal circumstances are not the ones that exist in most claim interpretation contexts, where adversarial parties are highly motivated by financial and other reasons to have their particular definition of a claim prevail.[69] Further, as Burk and Lemley point out, additional factors, like the legal rules surrounding claim interpretation (or claim construction, as the official legal proceeding where claim interpretation takes place is called) tend to compound this ambiguity.[70]

But even before a claim is interpreted in a legal context, linguistic ambiguities can make it difficult for interested parties to discern the precise scope of the right, and thus to decide whether their intended activities violate the inventor's rights as defined by the claims. This can lead to the inefficiencies described in the previous Section.[71]

2. Ambiguity about the purpose of claims

The ambiguity inherent in language can make it difficult to discern the precise boundaries of a patent claim. But as some scholars have noted, perhaps an even more fundamental problem with interpreting claims arises from the lack of consensus on what claims are supposed to be communicating in the first place.[72] Some of this uncertainty arises on the side of legal interpreters, who may have differing opinions about the correct scope of a patent.[73] For example, even if it is relatively clear from the claim language that a certain technology falls within the literal boundaries of the patent, there could be disagreement among legal

meaning—unless of course, 'a' means 'one or more"); Chiang, *supra* note 13, at 514–15 ("The existing literature on claim construction focuses on what I call the linguistic indeterminacy thesis—the argument that the problem with patent claims is their linguistic ambiguity and that such ambiguity results in overbroad patent rights."). *But see* Chiang & Solum, *supra* note 6, at 549 (debating the linguistic ambiguity hypothesis and asserting that "properly interpreted, a particular text almost always has only one correct linguistic meaning, though that correct meaning may be difficult to discern").

68. *See* Burk & Lemley, *supra* note 6, at 1749.

69. *See, e.g.*, Chiang, *supra* note 13, at 514 ("Because the patent claim defines the scope of the monopoly, patentees have a strong incentive to subtly slant the claim's language in a way that aggrandizes their rights to the detriment of the public."); Oskar Liivak, *The Unresolved Interpretive Ambiguity of Patent Claims*, 49 U.C. DAVIS L. REV. 1851, 1858 (2016) (referring to the "all-important claim construction" proceeding where "a court's determination of the extent of the claims is critical to every case. If construed narrowly enough, the defendant wins by non-infringement while the plaintiff wins if construed broadly").

70. Burk & Lemley, *supra* note 6, at 1753–61 (discussing how many factors, including the legal rules of claim construction, ambiguity in the intended audience of the claims, uncertainty about how to "break up" the language in the claims, the fact that claims are interpreted at different times for different reasons, and the problem of "metaconstruction" (using words to interpret words) contribute to and compound the fundamental problem of linguistic ambiguity discussed above).

71. *See, e.g.*, Menell & Meurer, *supra* note 66, at 33 ("The imprecision of patent claim scope in the software and business method fields is so bad that many developers ignore patents at the front-end and deal with licensing and litigation.").

72. *See, e.g.*, Liivak, *supra* note 69, at 1862.

73. *See, e.g.*, Chiang & Solum, *supra* note 6, at 534 (arguing that "uncertainty in claim application most typically arises because judges have core policy disagreements about the underlying goals of claim construction").

interpreters about whether that technology *should*, as a policy matter, come within the patent's claims.[74]

Oskar Liivak argues that this uncertainty over the purpose of claims also extends backwards in time from the interpretation stage to the drafting stage.[75] According to Liivak, there is no accepted common understanding of what the applicant and her attorney are communicating through the drafting of claims.[76] When an applicant drafts a claim and submits it to the PTO, is she making a representation about what she has actually invented ("I claim to have invented the following things"),[77] or is she simply requesting that the patent office grant her rights over the scope of technology encompassed within the claims ("I would like to claim exclusionary dominion over the following things"),[78] independent of what she actually invented? As explained further below, this Article adopts the assessment of Liivak that the first understanding ("I claim to have invented the following things") best effectuates the policy goals of the patent system because it reduces the potential for overbroad patents and the raft of harms (explained in the previous Section) that attends them.[79] It uses this understanding to shape the recommendations aimed at improving patent clarity proposed below.[80]

3. Other explanations

Patent law is a field of many idiosyncrasies, and some of these contribute to the problem of correctly discerning patent scope. For example, Burk and Lemley discuss how various factors contribute to uncertainty over the meaning of patent claims.[81] For one thing, because inventions described in patents are, by definition, novel, sometimes there are not yet settled definitions for the words used to describe them.[82] The legal rules courts use in the process of interpreting claims can also unduly complicate matters.[83] Additionally, there is uncertainty over the intended audience for patent claims: should the words in the claims be interpreted according to the perspective of the patentee or the hypothetical person having ordinary skill in the art?[84] Depending on the answer, particular words could be interpreted differently. Fourth, due to patent drafting rules, a claim often consists of a long, convoluted sentence, and there is no consensus on how interpreters should break up these sentences into individual claim elements.[85] But the outcome of this ad hoc decisionmaking process will almost certainly affect claim

74. *See id.* at 536.
75. *See* Liivak, *supra* note 69, at 1861.
76. *Id.* at 1854–55.
77. *Id.* at 1854.
78. *Id.*
79. *See* discussion *infra* Section V.A.
80. *See* discussion *infra* Section V.A.
81. Burk & Lemley, *supra* note 6, at 1751–52.
82. *Id.* at 1752.
83. *Id.* at 1753–54.
84. *Id.* at 1755–56.
85. *Id.* at 1756.

scope.[86] Fifth, when assessing questions of validity and infringement, courts must often compare claims to the existing literature or prior art.[87] This process will inform how claims are understood. But there are no set rules for interpreting this prior art—whether it consists of words or something else, like an object.[88] Burk and Lemley also discuss what they refer to as an issue of "metaconstruction."[89] When courts interpret claims, they use words to describe the claim's meaning.[90] But these interpretive words are equally susceptible to ambiguity and multiple meanings as the words in the claim they are supposedly clarifying.[91]

The question of time also presents a problem for patent clarity. Claims are interpreted for various legal reasons, but, as Burk and Lemley point out, those legal questions are asked with reference to different points in time.[92] For example, the validity questions of novelty and nonobviousness are tested as of the time of invention, whereas questions of infringement are tested at the time of infringement.[93] But understanding of claim terms can change during that time as related technologies evolve. Lemley and McKenna expand on this argument in their article *Scope*, where they explain how the separation in time between the consideration of validity, infringement, and defenses leads to inconsistencies and mistakes in claim interpretation.[94]

Janet Freilich has also written about how the variable of time affects a reader's understanding of claims.[95] She has identified patent law's so-called "sequence of information" problem,[96] which results from the fact that "[p]atent scope is set at the time that a patent is granted, while the information necessary to set and measure patent scope is not obtained until many years later."[97] In other words, the scope of a patent is largely defined by the words in the patent's claim, which are set at the time a patent is granted. But no one really knows the full set of technologies that will fall within those claims, because many of those technologies have not yet been developed.[98] This problem undermines the notice function of patents, because prospective downstream innovators do not know with

86. *Id.* at 1756–57.
87. *Id.* at 1758.
88. *Id.*
89. *Id.* at 1760.
90. *Id.*
91. *Id.*
92. *Id.* at 1757.
93. *Id.*
94. Lemley & McKenna, *supra* note 13, at 2219–66. As explained further below in the Section on opportunistic behavior, Lemley and McKenna also argue that this separation in time provides opportunities for parties to game the system, with IP owners emphasizing the narrowness of their rights during determinations of validity (in order to avoid having their claims invalidated) and then subsequently emphasizing the breadth of their rights during determinations of infringement (in order to bring more competitors within the scope of their claims). *See infra* Subsection II.B.4.
95. *See* Freilich, *supra* note 12, at 162.
96. *Id.*
97. *Id.* at 162.
98. *Id.*

certainty whether their activities will be deemed by a court to fall within the scope of an existing patent.[99]

Freilich notes that one potential solution to the sequence of information problem is to narrow the scope of patents to more closely track what the inventor actually invented, as evidenced by the information included in the specification.[100] In this way, downstream inventors and users have more information about what the patent covers; they do not have to wait until they have already engaged in their desired activities to find out.[101] This proposed solution is consistent with the approach adopted in this Article, which proposes various interventions to encourage inventors and their attorneys to claim consistent with the standard of "what the inventor actually invented."[102]

4. Opportunistic behavior

The phenomena described above can contribute to a lack of clarity in patent scope. But perhaps most troubling, and certainly most relevant to the thrust of this Article, is the role of opportunistic behavior among patent applicants. Many commentators have written about how patentees and their attorneys regularly exploit ambiguities in language and other complications in claim interpretation, using these complexities to obscure and broaden the scope of their rights.[103] This gaming occurs not only when claims are interpreted by a court and attorneys urge these institutions to adopt particular interpretations that benefit their clients,[104] but also at the patent drafting stage. For example, Peter Mennell and Michael Meurer have noted how patentees "maximize[] the likelihood that the patent can be stretched to reach unforeseen technologies during the patent life" by drafting "broad and vague" claims.[105] Indeed, this concern about overclaiming during patent drafting has been characterized by some as the predominant concern with patent scope in the literature.[106]

99. *Id.* at 163–64.

100. *Id.* at 187.

101. *Id.* ("If the patent grant is limited to the actual invention in the possession of the inventor at the time the patent is filed, all information about the patent grant is already known; therefore, there is less guesswork involved in determining the scope of the patent.").

102. *See* discussion *infra* Part III.

103. *See, e.g.*, Burk & Lemley, *supra* note 6, at 1745 ("Patent attorneys seize on [claim] indeterminacy to . . . expand their client's exclusive rights."); Chiang, *supra* note 13, at 515 (explaining the scholarly concern of "self-serving patentees draft[ing] . . . claims in an overbroad manner"); Mennell & Meurer, *supra* note 66, at 29–30 ("[P]otentially distorted incentives of [IP] resource owners to overclaim, confusingly claim, obscure, and opportunistically assert resource rights.").

104. Burk & Lemley, *supra* note 6, at 1745.

105. Mennell & Meurer, *supra* note 66, at 33; *see also* Seymore, *supra* note 67, at 639 (explaining how "some patentees deliberately suppress crucial information or purposely craft documents that are hard to understand"); Liivak, *supra* note 16, at 1418 ("Patent applicants and their attorneys aggressively seek as much exclusive real estate as possible . . . [by] routinely claim[ing] not just as broadly as they think the PTO and courts will allow but just in case . . . beyond (often far beyond) that.").

106. Chiang, *supra* note 13, at 523 ("One can understand much of the existing literature on claim construction as implicitly . . . argu[ing] that patentee-drafted claims are just self-serving statements: predictably overbroad, nondescriptive of the real invention, and with no other redeeming virtue.").

According to T.J. Chiang, this should not be particularly surprising.[107] As he explains, "[o]nce we consider a rational, self-interested patentee's actual incentives, it becomes obvious that patent claims are unlikely to describe the real invention. Rather, patentees will draft claims to cover as much as they can possibly get away with."[108]

The question for policymakers is what to do about this. In Part IV, I describe some of the proposed solutions the literature has offered before moving on to this Article's proposal in Part V.[109] But first, it is necessary to clarify what it means to draft overly broad claims. What behaviors, precisely, are we trying to address? The next Part attempts to answer that question.

III. WHAT DOES IT MEAN FOR A PATENT TO BE OVERBROAD?

A reader unfamiliar with this area of law may have safely assumed at this point a universal consensus on the evils of overclaiming and overbroad patents. But the question of what constitutes problematic overbreadth is far from settled. Many patent law scholars would agree, for instance, that in order to adequately protect an invention and provide the incentives the patent system is designed to provide, a patent necessarily must be drafted to cover at least *something* more than the inventor's particular embodiment(s) of an invention; otherwise, competitors could easily invent around the patent's claims and render the right effectively worthless.[110]

But how far beyond the inventor's own practice of the invention should the claims extend? The answer will depend on your orientation within the patent system. If you are an attorney representing a patent applicant, for example, the clear answer is "as broadly as possible." This follows from the attorney's duty to zealously advocate for her client.[111] Broad patent scope (to the extent that this scope can withstand a later invalidation challenge at the PTO or in court) means a more valuable property right for the client, and attorneys generally feel duty-bound—a sentiment backed up by the threat of malpractice[112]—to maximize their clients' gains.

If you are a patent scholar more focused on the big picture of innovation policy, however, you might have a somewhat different sense of what degree of claiming is appropriate. In general, you will probably believe that rights should

107. *See id.* at 523–24.

108. *Id.* at 522.

109. *See* discussion *infra* Parts IV, V.

110. *See, e.g.*, Dmitry Karshtedt, Mark A. Lemley & Sean B. Seymore, *The Death of the Genus Claim*, 35 HARV. J.L. & TECH., 1, 3 (2021) (explaining how patent lawyers draft so-called "genus" claims that cover a number of species beyond the species that the inventor has invented in order "to make sure that no one can copy their basic idea by making a small change to it to avoid infringing the patent").

111. Liivak, *supra* note 16, at 1418.

112. *Id.*

be narrower than what the advocate attorney might argue for. But even patent law scholars have differing views on what constitutes overclaiming.[113]

Patent law disclosure doctrines, including the enablement and written description requirements, are implicated in this scholarly debate.[114] The enablement requirement found in Section 112 of the Patent Act essentially mandates that claims be only so broad as to encompass the embodiments of an invention a person having ordinary skill in the art could "make and use" with the patent document and their own knowledge as guides.[115] Enablement is a relatively uncontroversial doctrine; most patent scholars likely would agree that enablement provides an appropriate check on the scope of patents.[116] Somewhat more controversial, however, is the written description doctrine, which requires a patentee and her lawyers to claim only what the inventor had in her "possession" at the time of filing.[117] Written description thus—at least in theory[118]—imposes an additional requirement on inventors. Claim scope must be cabined not only by the range of inventions the patent adequately teaches a person of ordinary skill to make and use, but also by what the inventor had in his possession at the time of filing—what the inventor actually invented.[119] For those who accept the written description doctrine, anything beyond this is overclaiming.

As Tim Holbrook has explained, however, some commentators and judges have criticized the written description requirement as providing insufficient guidance and giving free rein to the Federal Circuit to invalidate claims.[120] More recently, Dmitry Karshtedt, Mark Lemley, and Sean Seymore have persuasively argued that the Federal Circuit has inappropriately wielded the written

113. *Id.* at 1431. *But see* Burk & Lemley, *supra* note 6, at 1762 (using the term "overclaiming" in reference to "patentees drafting or interpreting claims years after the invention itself").

114. Other patent law doctrines, most notably the patentable subject matter requirement grounded in 35 U.S.C. § 101, also arguably deal with questions of patent scope. But I focus here on the disclosure doctrines of § 112.

115. 35 U.S.C. § 112(a).

116. *See, e.g.*, Christopher A. Cotropia, *What is the "Invention"?*, 53 WM. & MARY L. REV. 1855, 1871 (2012) (explaining that the enablement requirement "has deep historic roots and its contours are fairly settled"). *But see* Karshtedt et al., *supra* note 110, at 41–42 (arguing that the Federal Circuit has inappropriately broadened the enablement requirement in pharmaceutical genus claims to require the patentee to disclose how to make and use every species within the genus).

117. *See* 35 U.S.C. § 112(a); *see also* Cotropia, *supra* note 116, at 1871–72. Some of the controversy with written description revolves around whether the doctrine actually imposes—or should impose—any restriction on claim scope beyond what the enablement requirement mandates. *See, e.g.*, Timothy R. Holbrook, *Patents, Presumptions, and Public Notice*, 86 IND. L.J. 779, 795 (2011). Because one of the less controversial uses of the written description is to police the prohibition against adding new matter into a patent application after the initial filing, *see* 35 U.S.C. § 132(a). Another debate concerns whether it is ever acceptable to use written description to invalidate a claim that remains unchanged from first filing. *See* Cotropia, *supra* note 116, at 1872.

118. As discussed *supra* note 94, there is some disagreement about whether written description actually imposes a heightened disclosure requirement on inventors, or whether it is largely duplicative of the enablement mandate.

119. *See* Cotropia, *supra* note 116, at 1871–72.

120. Holbrook, *supra* note 117, at 795 (explaining how the use of written description as a separate basis for invalidation that applies across all technological fields "has been harshly criticized, both by judges on the court and commentators, as a standardless requirement that effectively grants the Federal Circuit discretion to strike down claims that it simply believes are too broad, regardless of what someone in the technological field might think").

description doctrine in such a way that it is virtually impossible for genus claims in the biotechnology, chemical, and pharmaceutical industries to survive.[121] But in the course of doing so, these scholars reaffirm that written description—and the concept of possession it embodies—continues to play an important role in patent law.[122] In particular, written description serves as a vital check against broad functional claiming in cases where a patentee has not yet discovered any embodiments of the invention that perform the claimed function.[123] It also prevents patentees from gaming the system and inappropriately broadening their claims by later claiming matter they didn't conceive of at the time of filing.[124]

This Article adopts a view of appropriate claiming consistent with a written description requirement "properly" applied (as defined by Karshtedt, Lemley, and Seymore, among others).[125] As Chris Cotropia has argued, a standard of appropriate claim scope that asks what the inventor actually invented (consistent with a written description requirement), grounded in a so-called "external" definition of the invention that is discerned primarily with reference to the patent specification,[126] helps effectuate the goals underlying the dominant theories of patents, including the incentive-to-invent theory.[127] Or, as Oskar Liivak succinctly puts it, "overclaiming means claiming beyond what the applicant invented and disclosed in the application."[128]

Notably, as Karshtedt, Lemley, and Seymore point out, under this definition a patentee can claim quite broadly without necessarily being guilty of overclaiming.[129] The question of overclaiming, therefore, has less to do with the absolute scope of a claim and more to do with what the inventor possessed at the time of filing and what they disclosed in the patent document.[130] Because this definition of overclaiming has much to do with the understanding and actions of a patent applicant, it fortuitously follows that interventions aimed at changing applicants' behavior have a good chance of addressing the problem of overbroad patents.

Adopting this definition of appropriate claim scope also helps solve the issues leading to a lack of clarity in patent boundaries identified by Liivak, Freilich, and others.[131] For example, explicitly adopting a definition of claim

121. Karshtedt et al., *supra* note 110, at 3–4.

122. *See id.* at 61.

123. *Id.*; *see also* Liivak, *supra* note 16, at 1432–36 (describing this kind of functional claiming as overclaiming).

124. *See* Karshtedt et al., *supra* note 110, at 39.

125. *Id.* at 60.

126. Cotropia, *supra* note 116, at 1876–78.

127. *See id.* at 1895–1905.

128. Liivak, *supra* note 16, at 1431.

129. Karshtedt et al., *supra* note 110, at 61 ("[T]he problem with [functional claiming] isn't that the claim is too broad per se, though many functional claims are quite broad. . . . Rather, the problem is that the patentee didn't get there yet, and the law does not want them to discourage further work by those who do actually take the time to find the solution and not just predict it."); *see also* Liivak, *supra* note 16, at 1431 ("If an invention is broadly disclosed with a broad set of variations, then a broad claim covering those broad variations is not problematic. The applicant invented broadly and is claiming accordingly.").

130. *See* Liivak, *supra* note 16, at 1431.

131. For a discussion of these issues, see *supra* Section II.B.

scope that is keyed to what the inventor actually invented (and communicating this definition to the inventor at the time of claiming in the ways identified in Part V below) helps solve the ambiguity identified by Liivak about what an inventor is communicating in drafting her claims.[132] It also helps solve the "sequence of information" problem identified by Freilich by limiting patent scope in a such a way that it is clearer at the time of drafting what a patent does and does not cover.[133]

IV. EXISTING SOLUTIONS FOR UNCLEAR SCOPE AND OPPORTUNISTIC BEHAVIOR

Given that the unclear scope of patents—and the opportunistic behavior that contributes to and exacerbates it—is such a well-recognized problem in the patent law literature, it is perhaps not surprising that many solutions have been proposed to address the issue. The point in time at which these fixes are designed to be implemented span the life cycle of a patent; some are meant to come into effect only when (if ever) a patent reaches the litigation stage, while others are intended to be implemented much earlier in a patent's life span—for example when the patent is being prosecuted, or even earlier, at the initial drafting stage.[134] In this Part, I outline some of these proposals. Due to the breadth of the literature and the sheer number of solutions that have been proposed, this overview is not intended to be exhaustive; instead, its purpose is to provide a flavor of the variety of proposed remedies.

A. At the Litigation Stage

One line of thinking about poorly drafted and unclear patents, articulated by Mark Lemley, is that interventions generally need not take place until a patent is challenged in an adversarial proceeding.[135] The reasoning runs as follows: the vast majority of patents live out their lives fairly innocuously, without being asserted by their owners or challenged by a competitor.[136] Given this reality, it would be a waste of resources for the patent office to devote significant time to weeding out bad patents at the prosecution stage.[137] Better, instead, to focus lawmakers' efforts on those patents that actually pose a threat to the efficient functioning of the system.[138] Under this view, the relative ignorance at the patent

132. *See* Liivak, *supra* note 69, at 1854–55.

133. *See* Freilich, *supra* note 12, at 187.

134. *See, e.g.*, Lemley, *supra* note 14, at 1508–10.

135. *See id.* at 1514.

136. *Id.* at 1501, 1503.

137. *Id.* at 1508–11.

138. *Id.* at 1510 ("The strong implication of these numbers [comparing the costs of devoting more resources to weeding out bad patents at the patent office to weeding them out at the litigation phase] is that society ought to resign itself to the fact that bad patents will issue, and attempt to deal with the problem ex post, if the patent is asserted in litigation."). *But see* Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 975 (2019) (revisiting the cost benefit analysis performed by Lemley and arguing

office about the quality of issued patents is "rational" in the sense that it is efficient.

With this reasoning in mind, Lemley and McKenna have proposed that the *Markman* hearing—during which challenged patents' claims are interpreted by a court prior to the determination of questions of validity and infringement—offers a good opportunity for lawmakers to set the "correct" scope of a patent.[139] In particular, they argue that determinatively setting the scope of a patent at a single point in time reduces the opportunity for patentees to claim that a patent has a narrower reach during validity determinations (in order to preserve validity) and a broader one when the question of infringement is later evaluated (in order to bring competitors' products within their zone of exclusivity).[140] But they do take issue with the way *Markman* hearings are currently conducted, arguing that courts' reluctance to think about validity while interpreting claims, along with an inappropriate focus on the words of the claim rather than on what the inventor actually invented, increases mistakes and multiplies opportunities for gaming behaviors among patentees.[141]

Other commentators have also weighed in on how changes to claim interpretation by the courts at the litigation stage could help address the problem of unclear and overbroad patents. Dan Burk and Mark Lemley have proposed a claim construction process that treats claims more like "sign posts" (meant to signal the central features of an invention) than "fence posts" (meant to delineate the outer boundaries of an invention).[142] According to Burk and Lemley, courts could do this by limiting claim construction to technical terms and the point of novelty of the invention and focusing more on the patentee's description of the invention and less on the words of the claims, among other suggestions.[143] In a similar vein, T.J. Chiang and Lawrence Solum have argued that simply recognizing that uncertainty over claim scope often stems from policy disagreements (how much scope to grant a patentee) rather than linguistic ambiguity could be a first step to fixing the problem.[144]

Tackling the problem from an institutional competence perspective, Arti Rai has proposed that the Federal Circuit relinquish some of its fact-finding power in setting the scope of patents (which arises primarily through *de novo* review) to the trial courts, who are better positioned to evaluate the facts necessary to appropriately construe claims.[145]

that in fact the most efficient course of action for weeding out bad patents is for the patent office to devote more resources to examining patents than it does currently).

139. Lemley & McKenna, *supra* note 13, at 2268–69.

140. *Id.* at 2268.

141. *Id.* at 2269–70.

142. Burk & Lemley, *supra* note 6, at 1747.

143. *Id.* at 1747–48.

144. Chiang & Solum, *supra* note 6, at 536–37.

145. Rai, *supra* note 9, at 1046–49.

B. At the Patent Prosecution Stage

Not everyone accepts that "rational ignorance" at the patent office is the best course of action. Some of the disagreement arises based on the calculations used by Lemley, now over twenty years ago, to support his theory that resources are best allocated to litigated patents.[146] Michael Frakes and Melissa Wasserman, for example, recently wrote that at the time Lemley performed the "rational ignorance" cost-benefit analysis, empirical data was sparse, necessitating a number of assumptions that can now be tested with hard data.[147] After performing a new cost benefit analysis with these data, Frakes and Wasserman conclude that "society would be better off investing more resources into the Agency to improve patent quality than relying on ex post litigation to weed out invalid patents. Given its current level of resources, the patent office is not being 'rationally ignorant' but, instead, *irrationally ignorant.*"[148]

A second concern with delaying action on overbroad patents to the litigation stage is that this course of action fails to account for the harms caused by the chilling effect of overbroad and vague patents.[149] Arti Rai, for example, has argued that Lemley's rational ignorance cost benefit analysis does not count the costs that arise when prospective users of a patented invention cannot afford to litigate or license a patent or are stymied in their licensing efforts by high transaction costs.[150] If the patents at issue should never have issued (or should have issued with a narrower scope), these are harms that could have been prevented (and with a lower price tag than in litigation) if the patent office had had the resources to deal with them appropriately.[151]

Whatever the individual reasons for believing that more needs to be done at the patent office to address vague and overbroad patents, various commentators have offered suggestions for ways that this could happen. The first implication of the above analysis, of course, is that the patent office needs more resources: more examiners spending more time evaluating patents.[152] Even without any further doctrinal or policy reforms, some commentators argue that this would make a big difference in reducing the number of vague and overbroad patents.[153]

But in addition to simply spending more time with patents, some scholars have proposed additional steps the patent office could take to ensure that the

146. *See generally* Lemley, *supra* note 14.

147. *See* Frakes & Wasserman, *supra* note 138, at 979–80.

148. *Id.* at 979–81.

149. Rai, *supra* note 9, at 1081–82.

150. *Id.* at 1080–85.

151. *Id.* Rai acknowledges that it is difficult to put a hard number on these chilling costs. Although she proposes that more resources be devoted to the patent office, she concludes that Lemley is likely "partly right" in arguing that it would not be cost effective for the patent office to become a "full-fledged administrative agency, whose fact finding would be subject to deference in all contexts."

152. *See* discussion *supra* notes 146–51 and accompanying text.

153. *See, e.g.*, Frakes & Wasserman, *supra* note 138, at 1020 ("Because the litigation and prosecution savings associated with increasing the Patent Office resources outweigh the costs associated with increasing the examiner's time allocations, we conclude that society would be better off investing more resources ex ante in the review of patent applications.").

patents that get through have appropriate scope and clarity. Menell and Meurer, for example, have argued that having the patent office enforce more stringent disclosure doctrines, including enablement and written description, could help solve the problem of overbroad and ambiguous patents.[154] They also recommend that examiners spend time explicitly considering the breadth and clarity of patent applications, apart from any particular doctrine.[155] According to Menell and Meurer, a glossary of commonly used terms, developed by the patent office and made available to patent applicants, could help avoid disputes over listed terms by making the glossary definition the default unless explicitly stated otherwise by the patentee.[156] And having the patent office record and make publicly available all interviews with patent applicants could help combat gaming by making it more difficult for patentees to claim one thing during prosecution and something different during litigation.[157]

Sean Seymore has also proposed that the disclosure standard exacted by the patent office be raised, in part to combat gaming behaviors, but also to enhance the teaching function of patents.[158] Seymore suggests that patent applicants be required to actually reduce their inventions to practice (that is, to make a working prototype of their invention instead of being allowed to constructively reduce their inventions to practice through disclosure, as current patent office rules permit) as a way to ensure that the granted patent more accurately reflects what the inventor has invented and to provide better information to downstream inventors hoping to learn from the patent.[159] This approach would reduce, if not eliminate, so called "prophetic examples" in patents, in which a patent applicant includes hypothetical experiments or results in the patent specification without having actually performed or obtained them.[160] Janet Freilich and Lisa Ouellette have also recently called into question prophetic examples,[161] arguing that in addition to potentially supporting the grant of weaker patents,[162] they are unduly confusing

154. Menell & Meurer, *supra* note 66, at 32–33. *See also* Cotropia, *supra* note 116, at 1907–08 (arguing that patent claims should meet a written description requirement, distinct form the enablement requirement, in order to pass muster at the patent office).

155. Menell & Meurer, *supra* note 66, at 33–34.

156. *Id.*

157. *See id.* at 34.

158. Seymore, *supra* note 67, at 641–42; *see also* Kesan, *supra* note 14, at 770–76 (arguing that prior art disclosure requirements should be strengthened and the presumption of validity should be removed from patents that don't comply with these heightened rules); Liivak, *supra* note 69, at 1872–74 (arguing that if claims are properly understood as delineating what the patentee actually invented, the indefiniteness standard should be relatively high, requiring patentees to describe what they have invented with a "high level of precision").

159. Seymore, *supra* note 67, at 642–44.

160. *Id.* at 641.

161. *See generally* Janet Freilich, *Prophetic Patents*, 53 U.C. DAVIS L. REV. 663 (2019); Janet Freilich & Lisa L. Ouellette, *Science Fiction: Fictitious Experiments in Patents*, 364 SCIENCE 1036 (2019); Lisa L. Ouellette, *Freilich & Ouellette: USPTO Should Require Prophetic Examples to Be Clearly Labeled to Avoid Confusion*, WRITTEN DESCRIPTION (June 18, 2019), https://writtendescription.blogspot.com/2019/06/freilich-ouellette-uspto-should-require.html [https://perma.cc/S447-XKQQ].

162. Freilich, *supra* note 161, at 715–16.

and harm downstream innovation by preventing innovators from performing the real-life versions of the prophetic experiments.[163]

Additional solutions have been proposed as well. Lemley and Moore, for example, have argued that the process of continuations, whereby a patent applicant can add additional claims to a prior application, should be reformed because as currently structured it encourages gaming behaviors and allows more bad patents to make it through the PTO vetting process.[164] And Polk Wagner, like Lemley and McKenna, has suggested that the scope of a patent be set at a single, early point in time in order to combat the gaming that can occur when scope is considered at multiple points in a patent's lifespan.[165] Wagner argues that the scope setting should occur at an even earlier point than Lemley and McKenna, however—during patent prosecution rather than at a Markman hearing—and that the scope be set by the patent office rather than the courts.[166]

C. At the Patent Drafting Stage

The distinction made here between "patent drafting" and "patent prosecution" is perhaps a false one, since patent drafting is something that continues to occur in a back-and-forth fashion with input from the patent office as a patent is being prosecuted. But I make it to differentiate between the actions and requirements of the patent office (for example, its requirement that a patent application meet the written description and enablement doctrines) and the actions of the prospective patentee and her legal representation. In order to be successful, a patent applicant is in some sense constrained by the requirements of the patent office; however, as has been discussed, this has not prevented patent applicants and patentees from engaging in opportunistic behaviors and trying to capture as much scope as possible, all while following the letter of the PTO's law.[167] The suggestions made by scholars and discussed in this Section, therefore, are focused more on the behaviors of the patentee when she drafts her application and claims.

As discussed earlier, the sum total of scholarly proposals that deal with the behavior of the patent applicant is somewhat smaller than those that focus on the patent office or the courts.[168] This is not entirely surprising given that the incentives to claim as broadly as possible, for both the patent applicant and her legal representation, are so strong that it can be hard to contemplate what—beyond the threat of rejection or invalidation wielded by heightened requirements and scrutiny by the patent office and courts—could be done to curtail this impulse.[169] Indeed, Chiang argues that the incentives of patent applicants to claim as broadly as possible are to be expected, and even embraced to some extent—both because

163. *Id.* at 688–90; Ouellette, *supra* note 161.
164. *See* Lemley & Moore, *supra* note 14, at 76, 93–94.
165. Wagner, *supra* note 14, at 2165–68.
166. *See id.* at 2166.
167. *See* discussion *supra* Part II.
168. *See* discussion *supra* Part IV.
169. *See supra* notes 19–20 and accompanying text.

having the applicant draft claims is preferable to the alternatives of having the PTO or courts make the first attempt to set the scope of the invention, and because applicants' impulses to overclaim are constrained by courts' later evaluation of the claims.[170]

Yet focusing on getting claims right at the drafting stage has significant advantages as compared to later-stage interventions. For one thing, it has the potential to preserve government resources as the PTO and the courts are spared much of the work involved in evaluating and setting appropriate patent scope.[171] Getting claim scope right (or at least closer to right) from the outset also avoids the uncounted but potentially significant costs imposed by chilling, wherein parties unwilling to challenge a broad or vague patent are nevertheless discouraged by that patent from legitimately practicing an invention.[172] It also significantly reduces opportunities for trolling: trolls cannot leverage broad and vague patents to extract rents from practicing entities if these patents never come into being.[173]

Further, one need not disagree with Chiang's assertion that patent applicants are in the best position to set the initial scope of claims to consider the ways in which patent applicants could be encouraged to draft claims that hew more closely to the actual invention from the outset. To this end, Menell and Meurer have proposed a variety of PTO drafting requirements to enhance patent clarity and achieve improved compliance with enablement and written description doctrines.[174] Some of these include requiring applicants to indicate whether embodiments of the invention described in the patent are meant to limit the claims, and to identify the support in the broader patent document for each claim limitation.[175] Along similar lines, Janet Freilich and Jay Kesan have argued that patent drafters should be encouraged (though not required) to use standard, industry-approved language when describing their inventions and have proposed the use of optional templates in the drafting process to reduce ambiguity over the scope of a patent's claims.[176] Harry Surden has also proposed various patent drafting innovations to help clarify claim scope, including requiring a patentee to act as his own lexicographer and clarify ambiguous terms up front.[177]

More directly, Liivak has argued that in cases where a patent applicant aggressively overclaims (for example, by using broad functional language to claim all possible methods of solving a problem without adequate supporting disclosure of particular embodiments) he and his representation should be threatened with criminal sanctions.[178] The basis for this threat is the inventor's oath, which all patent applicants must sign to represent that they are the "original inventor"

170. Chiang, *supra* note 13, at 515–16.
171. *See id.* at 517.
172. *See* discussion *supra* Subsection II.A.2.
173. *See* discussion *supra* Subsection II.A.4.
174. *See infra* note 175 and accompanying text.
175. Menell & Meurer, *supra* note 66, at 33.
176. Freilich & Kesan, *supra* note 16, at 234, 251–55.
177. Surden, *supra* note 16, at 1809–20.
178. Liivak, *supra* note 16, at 1419.

of the applied-for invention.[179] According to Liivak, if an inventor is egregiously overclaiming, she cannot truthfully attest that she is the "original inventor" of the invention disclosed in the overbroad patent because she has not actually invented the full scope of what she is trying to claim.[180] She should therefore be liable for making a false statement to the government under 18 U.S.C. § 1001, which prohibits such behavior.[181] Liivak makes clear that the ultimate goal of his proposal is not "mass incarceration of the patent bar."[182] Instead, it is to instill an appropriate sense of the seriousness of overclaiming and provide a necessary counterbalance to the strong incentives of patent applicants and their representation to claim as broadly as possible.[183]

Like the examples discussed in this Section, this Article deals with the patent applicant's behavior at the drafting stage. And like Liivak's proposal, it leverages the inventor's oath requirement.[184] But it differs from this proposal in that it is designed to encourage better drafting behaviors without making use of overt threats or incentives. Instead, it uses psychological insights to nudge patent drafters in the direction of clearer and more accurate claims.

V. SMART PATENT APPLICATIONS

Although not a universally accepted proposition, a subset of scholars have noted that having a patent's claims represent more closely what an inventor has actually invented would do much to improve clarity of claims, enhance the notice function of patents, and increase the efficiency of the patent system as a whole.[185] And there have been no shortage of proposals about how to achieve this goal—though, as noted above, many of these have focused on claim interpretation by the courts or PTO requirements, while fewer have centered on drafting behavior.[186] Here, I make use of insights from the social psychology literature to

179. *Id.* at 1420.

180. *Id.* at 1438–39.

181. *Id.* at 1420.

182. *Id.*

183. *Id.* at 1423.

184. *Id.* at 1447; *see infra* Section V.D.

185. *See, e.g.*, Cotropia, *supra* note 116, at 1886 (arguing that "the claim *is* [or should be] the invention"); Burk & Lemley, *supra* note 6, at 1762 (arguing that the ideal scope of patent claims should encompass only "the product that [the inventor] actually built or described . . ."); Liivak, *supra* note 69, at 1862, 1869–72 (arguing that interpreting claims as describing what the inventor has invented is more consistent with §112 of the Patent Act); Oskar Liivak, *Rescuing the Invention From the Cult of the Claim*, 42 SETON HALL L. REV. 1, 44 (2012) (arguing that claims should be interpreted to cover the "set of embodiments disclosed in the specification . . ."—in other words, what the inventor has actually invented and described in the patent document); Peter Lee, *Substantive Claim Construction as a Patent Scope Lever*, 1 IP THEORY 100, 104 (2010) (arguing that the interpretation of claims should focus on the claimed "invention's substantive technological contribution"); ROBERT P. MERGES & JOHN F. DUFFY, PATENT LAW AND POLICY 770 (6th ed. 2013) (arguing that claims should be interpreted so as to calibrate scope in line with "what the real merit of the alleged discovery or invention is"); Retractable Techs., Inc. v. Becton, Dickinson & Co., 653 F.3d 1296, 3111 (Fed. Cir. 2011) (Plager, J., concurring) (arguing that "the claims cannot go beyond the actual invention that entitles the inventor to a patent," and that "[f]or that we look to the written description").

186. *See* discussion *supra* Part IV.

propose reforms to the drafting process that could encourage patent applicants to claim more honestly and more in line with what they believe the invention to be.

This proposal follows similar proposals in the tax literature for encouraging honesty in tax filing. Filing taxes and submitting a patent application have much in common.[187] Tax filers and patent applicants alike make representations to the government, often with professional assistance, with the aim of maximizing their personal benefit (either by obtaining the broadest possible scope of exclusive protection over an invention or by minimizing financial liability).[188] The incentives are therefore strong for applicants to make questionable representations that may cross the line into outright dishonesty.[189] In both cases, this fudging or dishonesty is costly for society.[190] But for both taxes and patents, the government has limited resources with which to evaluate the accuracy of the applicant's representations.[191] For the most part, applicants are held in check by the specter of negative consequences for overreach or dishonesty (in the case of taxes, criminal sanctions; in the case of patents, the threat of losing patent protection altogether through a finding of invalidity).[192] But despite these threats, overreach in both areas persists.[193] Indeed, the nature of the sanctions themselves may encourage applicants, especially when they have the help of sophisticated professionals, to come as close to the line of prohibition as possible without crossing it.[194]

A different approach for taxes would use nudges rather than threats. Joseph Bankman, Clifford Naas, and Joel Slemrod have argued that merely changing the structure and wording of tax returns can increase honesty among filers.[195] The authors rely on empirical findings from social psychology to support proposals along these lines.[196] With modification, similar proposals could be implemented in the patent application process to reduce strategic behaviors by patent owners and enhance the clarity of patent boundaries. Here, I explain how that could work.

A. Communicating What Is Expected of the Patent Applicant

With taxes, it is fairly clear to all involved what is expected of applicants. Tax filers are required to accurately report their income from various sources so the government can determine their tax liability.[197] If filers are eligible for any reduction in liability, they are required to make truthful representations in

187. *See* Liivak, *supra* note 16, at 1419–20 (noting the similarities between patent claiming and tax filing).
188. *See id.* at 1449–50.
189. *See id.*
190. *Id.* at 1419.
191. *Id.* at 1419–20.
192. *See id.* at 1419, 1425.
193. *See id.* at 1428–31.
194. *Id.* at 1423.
195. Bankman et al., *supra* note 5, at 465–66.
196. *See id.*
197. *See* Liivak, *supra* note 16, at 1420.

seeking these reductions while not claiming any reductions to which they are not legally and factually entitled.[198]

In contrast, the obligations of the patent applicant are less clear. As Liivak has pointed out, there is currently no consensus about what a patent applicant is (or is supposed to be) representing to the government when she drafts her claims.[199] Is she saying "I have invented the following things"; or rather, "I claim exclusive rights over the following things"?[200] As discussed, the first formulation is more desirable from a policy perspective because it reduces the potential for overclaiming and the adverse social effects that flow from this behavior.[201] But most applicants, guided by attorneys and agents bound to zealously advocate for their clients, are likely to adopt the second formulation as their guide in drafting claims.[202]

And there is nothing in the patent application process that stops or even discourages them from doing so.[203] Current instructions provided by the PTO to utility patent application filers do not adequately distinguish between the formulations or provide adequate guidance to inventors.[204] They state in part that

> [t]he claim or claims must particularly point out and distinctly claim the subject matter that the inventor or inventors regard as the invention. The claims define the scope of the protection of the patent. Whether a patent will be granted is determined, in large measure, by the scope of the claims.[205]

Although these instructions do refer to what "the inventor . . . regard[s] as the invention," it is not clear that the inventor must limit her claims to what she has actually invented.[206] If anything, these instructions, with their emphasis on the scope of protection, may privilege the less desirable alternative formulation ("I claim exclusive rights over the following things") at the expense of the more desirable one.

A better approach would be a set of instructions that clearly communicates to filers what is expected. For example, the instructions could advise filers that

> [t]he claim or claims must particularly point out and distinctly claim the subject matter that the inventor or inventors regard as the invention. The claims must be only as broad as what the inventor or inventors have invented and no broader. What the inventor has invented includes any embodiments actually reduced to practice by the inventor as well as

198. *See* Bankman et al., *supra* note 5, at 460.
199. *See* Liivak, *supra* note 69, at 1853–54.
200. *See id.* at 1854-55.
201. *See supra* Part III.
202. *See* Chiang, *supra* note 13, at 515.
203. *See* Liivak, *supra* note 16, at 1421.
204. *See id.* at 1423.
205. *Nonprovisional (Utility) Patent Application Filing Guide*, USPTO, https://www.uspto.gov/patents/basics/types-patent-applications/nonprovisional-utility-patent (last visited Oct. 9, 2022) [https://perma.cc/JU5N-R792].
206. *Id.*

embodiments in the inventor's possession constructively reduced to practice through an enabling description in the patent application.

This exemplar, though not intended to be perfect, would function as an improvement over the current instructions in several ways. First, it resolves the ambiguity identified by Liivak over what applicants are supposed to be claiming, giving notice to both applicants and their representation of what is required.[207] The notice to patent agents and attorneys is particularly important because it constrains their duty to zealously advocate for their clients within clear limits.[208] Without a clear statement from the government about what is expected from patent applicants, it might be malpractice for an attorney *not* to claim as broadly as possible.[209] With such a statement, it might be malpractice for her to do so.[210]

Second, it resolves this ambiguity in favor of narrower and clearer claims. As discussed above, I take the position advocated by other scholars that this reduced scope of claims brings with it social benefits.[211]

Third, it provides context for what it means to claim only what has been invented by referencing the written description ("possession") and enablement doctrines. This should help inventors and their attorneys understand the claiming standard. It also subtly shifts the responsibility of the applicant with respect to the enablement and written description eligibility requirements.[212] Rather than allowing the applicant to view these requirements as barriers to be snuck past without raising undue concern from the patent examiner—all the while hoping that the claims can be amended as minimally as possible if the examiner does raise the issue—the proposed instructions make clear that it is the applicant's responsibility to draft claims that largely comply with these requirements in the first instance. Because examiners are often overburdened and overbroad claims often do fail to attract their attention,[213] this shifting of responsibility, though subtle, is significant.

B. Direct Questions

Empirical studies in social psychology and neuroscience have found that it is cognitively easier to tell the truth than to lie,[214] and that the difficulty of lying increases with the explicitness of the lie.[215] People also prefer to conserve cognitive capacity when possible. Taken together, these results suggest that truth

207. *See* Liivak, *supra* note 69, at 1854.

208. *See* Liivak, *supra* note 16, at 1418.

209. *See id.* (describing how "malpractice cases have been brought against patent attorneys who did not secure maximal protection for their client").

210. *See id.*

211. *See* discussion *supra* Part III.

212. *See* Liivak, *supra* note 16, at 1418.

213. *See, e.g.*, Frakes & Wasserman, *supra* note 138, at 978.

214. *See, e.g.*, van Veen et al., *supra* note 1, at 1472–73 (finding that additional brain regions are necessary to tell a lie); Gombos, *supra* note 1, at 197–99 (surveying research detailing the "increased cognitive effort associated with a lie").

215. *See, e.g.*, Trivers, *supra* note 2, at 383 (explaining how the "fully conscious effort to lie" imposes a greater cognitive load than indirect attempts at deception that can be more easily rationalized).

telling will increase when the only other alternative is telling an explicit lie. In other words, by forcing people to lie by commission rather than giving them opportunities to be dishonest by omission we increase the costs of dishonesty, leading more people to choose honest behaviors.[216]

Tax scholars have relied on this insight to propose that tax returns include direct questions whenever possible.[217] Direct questions force the filer to be honest or bear the cognitive costs of telling an explicit lie.[218] Further, the authors point out that direct questions signal to the filer that the questioner (here, the government) is interested in the response, and will respond commensurate with this interest to ferret out dishonest answers.[219] This enhances the psychological salience of detection and its consequences in the mind of the filer as he fills out his return, further increasing the costs of dishonesty.[220] One proposal along these lines suggests that tax filers be required to answer a yes-or-no question about whether they received any taxable gifts, rather than the current approach of relying on filers to affirmatively report any taxable gift.[221] The current approach makes it easier for filers to be dishonest by omission, while the direct question approach would force filers to affirmatively lie if they had any taxable gifts they were not reporting.[222] Similarly, a second proposal would expand the scope of yes-or-no questions to include reporting of income from work as an independent contractor or for an employer who did not provide the filer with a W-2.[223] Again, the current approach is to simply provide a line for filers to report this income.[224]

A similar direct questioning approach would be effective in the patent claiming context. When completing the patent application, the PTO could require the inventor to answer a series of direct yes-or no questions like those proposed for tax returns. In the patent context, the questions might look something like this:

- Do the above-drafted claims accurately represent what you, the inventor or inventors, believe to be the invention? As a reminder, the "invention" should encompass any embodiments of the invention actually reduced to practice by you, plus those embodiments in your possession which are described sufficiently in the patent application to enable a person having ordinary skill in the art to make and use them. **You must answer "yes" or "no."**

216. *See, e.g.*, Schweitzer & Croson, *supra* note 3, at 231 (finding that "subjects were less likely to lie when asked a direct question").

217. *See* Bankman et al., *supra* note 5, at 465–66.

218. *See id.*

219. *See id.*

220. *See id.*

221. *See* Jay A. Soled, *Homage to Information Returns*, 27 VA. TAX REV. 371, 384 (2007).

222. *See id.*

223. Bankman et al., *supra* note 5, at 469–72.

224. Under the proposal an example of the reporting would instead look like this:

8. Additional payments from employers

a. Did you receive cash or other compensation for part or full-time work from employers who did not provide you with a W-2? **You must answer "yes" or "no."**

If your answer to this question is "yes" complete 8b and 8c.

Id. at 471.

- If your answer is no, please describe how the claims could encompass subject matter that differs from what you have invented.
- Do you, the inventor or inventors, believe that the above-drafted claims encompass any subject matter that you have not invented, as described in Question 1? **You must answer "yes" or "no."**
- If your answer is yes, please describe the subject matter you have not invented that you believe may be covered by the claims as drafted.

Though clearly not perfect, an approach like this would accomplish two things. First, it reminds filers what is expected from the claims. Second, it requires inventors to think about what the claims do and do not encompass; if they are in fact drafting the claims broadly with the hope of capturing additional subject matter, it forces them to explicitly lie about it. The hope is that this lying would be too uncomfortable for many filers, thereby encouraging them to claim more narrowly and reducing the prevalence of this strategic behavior.

C. More Detailed Questions

The direct questioning approach advocated above is complicated somewhat in the patent context by the fact that patent claims (as explained) are notoriously hard to get a handle on. Unlike in the tax context, where there is often a binary or numerical answer to a question (*e.g.*, did you receive any additional income. and if so, how much); with patents, an applicant may not be entirely certain about what the drafted claims encompass.[225] It is thus somewhat less straightforward in the patent context to ask whether a patent applicant is overclaiming and to expect an honest answer when the applicant himself may not even be sure.

This is not an intractable problem, however. First, by making it clear that the claims should encompass only those embodiments actually reduced to practice or constructively reduced to practice through an enabling description that meets the written description requirement, many of the sources of ambiguity around patent claims discussed in the literature are resolved.[226] For example, the ambiguity around the purpose of patent claims described by Chiang, Solum, and Liivak[227] disappears because policymakers have explicitly chosen and communicated a particular conception of the purpose of claims. And Freilich's sequence of information problem is largely resolved because, under this chosen conception, the degree of after-arising technology encompassed by claims will necessarily be limited.[228]

Of course, one of the sources of ambiguity not resolved by a simple clarification of the correct scope of claims is the confusion introduced by deliberate obfuscation and overclaiming. And this source of ambiguity arguably *can* be addressed through the types of direct questions discussed above. If a patent applicant or her attorney knows she is attempting to claim more than what she is

225. *See* Liivak, *supra* note 69, at 1854.
226. *See id.* at 1870.
227. *See generally* Chiang & Solum, *supra* note 6; Liivak, *supra* note 69.
228. *See* Freilich, *supra* note 12, at 151–52.

entitled to based on the actual invention, then she should be able to answer the direct questions about overclaiming accurately. And the hope is that the direct questioning approach will nudge her to do so more honestly.

Additionally, more detailed questions can help clarify the correct standard for claiming and make any dishonesty more obvious and salient to the patent applicant and her representation. For example, the applicant could be required to identify which of the claimed embodiments she has actually reduced to practice, and conversely, the general universe of embodiments for which she is relying on an enabling disclosure. The applicant could then be required to point to the sections of the specification she believes to be enabling of those not-yet-reduced-to-practice embodiments.

Though this requirement may seem draconian in theory, in practice it need not be so. Consider, for example, a pharmaceutical genus claim that claims a class of chemicals useful for treating a particular disease. The patentee could be asked to identify the particular embodiments of the genus she has actually reduced to practice:

> Have you actually reduced to practice any embodiments of the invention you are claiming? **You must answer "yes" or "no."**
>
> If your answer is yes, please indicate which embodiment(s) of the invention you have actually reduced to practice, and indicate where in the specification these embodiment(s) are described.

These questions should be fairly straightforward to answer, as the applicant can point to the sections of the specification where the chemical entity or entities actually created and tested are described.

Next, the applicant can be asked about what other embodiments she believes to be encompassed by the claim:

> Do you believe that other embodiments of the invention not actually reduced to practice by you are encompassed by the claim as drafted? **You must answer "yes" or "no."**
>
> If your answer is yes, please describe the general class of inventions you believe to be encompassed by the claim. If this class is described in the specification, you may indicate where in the specification it is described.
>
> If your answer is yes, please indicate the portions of the specification that provide the necessary information to enable a person having ordinary skill in the art to make and use the class of inventions.

Again, for our example of a genus of chemical entities, answering these questions should be a fairly straightforward task for the applicant. To answer the first follow-up question, the applicant need only describe the general class of chemicals she is claiming—information that is likely already included in the specification. And to answer the second, the applicant need only point to the enabling disclosure in the specification.

Importantly, to answer these questions honestly, an applicant need not have identified or even thought of every embodiment within the claims. If the general class is described and a process for finding additional claimed embodiments is

clearly laid out in the specification, this should suffice. Far from being overly stringent, then, this approach would actually represent a scaling back from the Federal Circuit's current approach as described by Karshtedt and colleagues, where the court has been appearing to require a patentee to identify every species within a genus in order for a genus claim to be upheld.[229]

D. Swearing an Oath

Reminding individuals of the moral dimensions of their actions can also increase honest behaviors, if done correctly. A series of studies conducted in the early 2010s suggested that these reminders were most effective when they took place before a participant engaged in an action rather than after the behavior had already occurred.[230] Recent work has called this finding into question, however, and suggests that *when* the reminder takes place is likely less relevant than the simple presence or absence of such a reminder.[231]

The content of such moral reminders, however, does appear to be relevant. Psychologists have found that appeals to morality are most effective when they target the personal character of the subject rather than the undesirable behavior.[232] For example, while the appeal to "please don't cheat" had no significant effect on cheating behaviors in experimental treatments, the entreaty to "please don't be a cheater" significantly deterred cheating.[233] This finding is consistent with broader work in moral psychology examining the role of an individual's perceived identity in decision-making.[234]

Based on these findings, tax scholars have proposed specific changes to tax returns. Currently, tax filers are required to sign a statement of honesty after they have completed filling out their returns.[235] Based on the earlier research about beginning- versus end-signing, Bankman and colleagues suggest that instead,

229. *See* Karshtedt et al., *supra* note 110, at 4.

230. Lisa L. Shu, Nina Mazar, Francesca Gino, Dan Ariely & Max H. Bazerman, *Signing at the Beginning Makes Ethics Salient and Decreases Dishonest Self-Reports in Comparison to Signing at the End*, 109 PNAS 15197, 15200 (2012).

231. *See generally* Ariella S. Kristal et al., *Signing at the Beginning Versus at the End Does Not Decrease Dishonesty*, 117 PNAS 7103, 7104 (2020) (explaining that in a series of experiments the authors failed to replicate their original 2012 result, but citing real-world evidence that the addition of a moral reminder where one previously did not exist increased honesty).

232. Christopher J. Bryan, Gabrielle S. Adams & Benoît Monin, *When Cheating Would Make You a Cheater: Implicating the Self Prevents Unethical Behavior*, 142 J. EXPERIMENTAL PSYCH.: GEN. 1001, 1001 (2013).

233. *Id.*

234. *See, e.g.*, Christopher J. Bryan, Gregory M. Walton, Todd Rogers & Carol S. Dweck, *Motivating Voter Turnout by Invoking the Self*, 108 PNAS 12653, 12653 (2011); Susan A. Gelman, Michelle Hollander, Jon Star & Gail D. Heyman, *The Role of Language in the Construction of Kinds*, 39 PSYCH. LEARNING & MOTIVATION 201, 217–20 (2000); Benoît Monin & Alexander H. Jordan, *The Dynamic Moral Self: A Social Psychological Perspective*, *in* PERSONALITY, IDENTITY, AND CHARACTER: EXPLORATIONS IN MORAL PSYCHOLOGY 341, 341–42 (Darcia Navarez & Daniel K. Lapsley eds., 2009).

235. I.R.S., 2021 FORM 1040, https://www.irs.gov/pub/irs-pdf/f1040.pdf [https://perma.cc/J6WS-4LAL] ("Under penalties of perjury, I declare that I have examined this return and accompanying schedules and statements, and to the best of my knowledge and belief, they are true, correct, and complete. Declaration of preparer (other than taxpayer) is based on all information of which preparer has any knowledge.").

filers be required to sign this statement at the beginning of their returns, before they have answered any questions.[236] They also propose that the statement of honesty include a reference to the personal attributes of the filer ("please don't be a cheater"), or that, alternatively, a reminder focusing on the filer's character be included at the top of every page of the return.[237]

Similar suggestions could also be easily implemented in the patent filing context to counter strategic overclaiming behaviors. Inventors are already required to sign an Inventor's Oath or declaration in conjunction with a patent application.[238] Currently, the declaration requires a signatory to attest only that she is the inventor of the claimed invention.[239] It does not explicitly address the issue of overclaiming.[240] Further, the declaration is filed as a separate form and there is no requirement that it be filled out at any specific stage in the process, as long as it is filed with the rest of the application.[241]

To address undesirable overclaiming behavior, the declaration should be modified to explicitly reference overclaiming. In accordance with the insights discussed above, the reference should be worded to target the personal characteristics of the inventor. For example, a modified declaration could explain that "Claiming rights to what you have not invented or that are broader than what you have invented is lying. Please do not be a liar."

The declaration could then require the inventor to sign an attestation that the applied-for claims are only as broad as what she believes she has invented and no broader. Although requiring the oath to be signed at the beginning versus the end of the patent application process may not make a significant difference in increasing the honesty of filers, it could still be helpful to require applicants to sign the oath immediately before or immediately after drafting their claims simply to tie the oath more explicitly to the claim drafting process. Further, to increase salience, similar identity-invoking reminders could be included not only with the oath but at various stages during the application process, for example, in the initial instructions.

E. Recording Examiner Interviews

In thinking about how policymakers might improve the patent claiming process and reduce strategic behaviors, Menell and Meurer and others have suggested that all interviews between patent examiners and an applicant or his

236. Bankman et al., *supra* note 5, at 466–69.

237. *Id.* at 474–75.

238. 35 U.S.C. § 115 ("[E]ach individual who is the inventor or a joint inventor of a claimed invention in an application for patent shall execute an oath or declaration in connection with the application." The oath must attest that "(1) the application was made or was authorized to be made by the affiant or declarant; and (2) such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application."); *see also* USPTO, MANUAL OF PATENT EXAMINATION AND PROCEDURE § 602.01(a) (9th ed., rev. 10, 2020) (describing the oath requirement).

239. 35 U.S.C. § 115(b)(2).

240. *See id.*

241. *See id.*

representation be recorded.[242] This suggestion dovetails well with the suggestions I make above.[243] As scholars promoting this reform have noted, providing a record of statements and representations made to the PTO will make it more difficult for applicants to game the system by making one (usually narrowing) statement that works to their advantage at an earlier point in time, and then later making a contradictory (usually broadening) statement.[244] But in addition to this, the very fact of recording should increase honesty among applicants by signaling to the filer that the government cares about the representations the applicant is making and is taking steps to track any dishonesty.[245] As with direct questions, this signal of interest makes the possibility of detection—and the costs that come with it—more salient in the mind of the applicant, making dishonesty more risky and less appealing.[246] For example, examiners could explicitly ask in interviews, in handling an applicant's response to a rejection, whether the applicant is explicitly disclaiming scope to address the rejection and obtain an issued claim. If the interview is recorded, applicants will know that the government takes the answer seriously and that the applicant will be held to her representations in the future. This should reduce the motivation to game and make clear to the applicant that what she represents as the claim scope during prosecution will be the accepted claim scope going forward.

VI. PRACTICAL CONSIDERATIONS

The suggestions I make in the previous Part could do much to enhance clarity and honesty in patent claiming.[247] But as with any proposals for reform, there are practical considerations to be taken into account. In this Part, I explore some of the challenges involved in implementing these reforms, along with suggestions for how policymakers might think about and address them.

A. Implementing Changes

The biggest challenge for any type of reform is in the implementation. What would be involved in implementing these particular suggestions for reform? Is it a feasible proposition?

The answer is yes. Because the process for filing patent applications is dictated by the PTO, the agency is free to make changes to this process without need for legislative action.[248] Although agency action is not necessarily a straightforward or simple proposition, removing Congress from the equation streamlines things greatly and enhances the chances for actual reform.

242. Menell & Meurer, *supra* note 66, at 33–34.
243. *See* discussion *supra* Section V.D.
244. *See, e.g.*, Menell & Meurer, *supra* note 66, at 33–34.
245. *See generally id.*
246. Bankman et al., *supra* note 5, at 462–63.
247. *See supra* Part IV.
248. 35 U.S.C. § 2.

Further, the reforms I suggest are relatively low cost and, even better, self-sustaining. The main cost would be the upfront expenditure involved in implementing the changes to the patent application process. Currently, the bulk of a utility patent application consists of the submission of the specification and claims, along with the fees, the Inventor's Oath, and an application data sheet containing information about the inventor(s), applicant(s), and application information.[249] Implementing the reforms suggested here would require restructuring the process somewhat to allow for the inclusion of questions about the invention and the signing of the Inventor's Oath at a particular point in the process (preferably, at a time proximate to the time of submitting claims).

One way this could be achieved would be by converting the application to an online form, where the applicant includes information and answers questions in a predetermined sequential manner. For example, after inputting initial information about the application, the applicant could be required to upload the specification and claims. She could then be asked to answer the series of questions about the claims and sign the Inventor's Oath before submitting her application.

This change to the process, once implemented, would require little ongoing resource commitment beyond the maintenance necessary to keep the online submission system functioning properly. Compared to investing resources in additional examiners, however, this commitment is relatively minor and yet should reap positive benefits.

B. Patent Owners and Patent Drafters

My proposals are complicated to some extent by the fact that it is often not inventors, but lawyers and patent agents, who actually fill out patent applications and draft patent claims.[250] How then can policymakers expect changes to the patent application to increase honesty among patent applicants, when the applicant herself is not filling out the application?

This reality might seem like a major impediment to the success of my suggested reforms. But in fact, this feature of the patent application process can be viewed as an opportunity to enhance the power of these proposals. Bankman and colleagues confront a similar situation in the tax context.[251] As with patent applications, intermediaries like accountants often do the actual work of filling out and submitting tax returns.[252] Instead of seeing this as a weakness in their proposal, however, these scholars consider it a strength.[253] Because their suggestions require direct answers or attestations from the taxpayer himself (rather than the accountant), in practice, accountants will be required to solicit the required

249. *Nonprovisional (Utility) Patent Application Filing Guide*, USPTO, https://www.uspto.gov/patents/basics/types-patent-applications/nonprovisional-utility-patent#heading-4 (last visited Oct. 11, 2022) [https://perma.cc/H85W-24HL].

250. *See* 37 C.F.R. § 1.46(d).

251. *See* Bankman et al., *supra* note 5, at 475–78.

252. *Id.* at 475.

253. *Id.* at 477–79.

responses and signatures from taxpayers.[254] As the payer must respond directly to a human accountant rather than having the option of simply leaving a line on a government form blank, Bankman and colleagues postulate that their suggestions will in fact be more effective in those cases where an intermediary is preparing and submitting tax forms.[255]

The same holds true for patent applications. Patent lawyers and agents must work with inventors while drafting patent applications. Application requirements can be modified so that drafters must seek explicit answers and signatures from inventors at key times during the application process. For example, the inventor should be required to be present (either in person or remotely via technology) while the application is being submitted through the online form proposed above. The agent could be required to read the questions to the inventor and solicit answers, along with an attestation of the Inventor's Oath. Making clear to both drafters and inventors what is required and including questions and statements that increase the cognitive costs of strategic behaviors should make it more difficult for parties to overclaim, regardless of who actually drafts and submits the patent application.

C. Corporations Versus Individual Applicants

Another related complication arises from the fact that many patent applicants are corporations rather than individuals. The majority of inventors in the patent system are employees at innovative companies who have signed employment contracts assigning their intellectual property to their employers.[256] Though I don't have comprehensive data, my understanding (obtained through informal conversations with employed inventors) is that companies often try to shield their inventors from the patent application process to help them stay focused on their main task of innovating. Thus, in a typical scenario, an employed inventor might hand over her invention to the company's legal department, after which she has little involvement in the patent application process. In fact, the America Invents Act of 2011 (the most recent major reform of the patent statute) facilitates this dynamic by allowing a company to sign the Inventor's Oath on behalf of the inventor in certain circumstances.[257]

Although this strategy might be an efficient one for companies, from the perspective of ensuring clearer patents of appropriate scope, it is wrong. Inventors should be required to spend time with the legal department—at least to the extent necessary to understand the scope of claims being requested—and to sit with the patent attorney, answering questions about claim scope and signing the Inventor's Oath while the application is being submitted. The changes to the application process proposed above would necessitate this change. Similarly, the

254. *Id.*

255. *Id.*

256. Stephanie Plamondon Bair, *Innovation, Inc.*, 32 BERKELEY TECH. L.J. 713, 721 (2017).

257. *See* 37 C.F.R. § 1.46(d); Leahy-Smith America Invents Act of 2011, Pub. L. No. 112-29, 125 Stat. 284 (codified as amended at 35 U.S.C. § 118).

provision of the America Invents Act allowing for companies to sign the Inventor's Oath on behalf of their inventors should be repealed.[258] Inventors should be required to make that attestation on their own behalf. Requiring greater interaction between inventors and patent attorneys is a recipe for claims that more closely represent the actual invention.

Though companies initially might not appreciate this additional burden on their inventors' time, it might reap unexpected benefits. Inventors often cite the psychological and reputational benefits they enjoy from having patents in their name.[259] A patent signals both to the inventor herself and to those around her that she has accomplished something worthwhile.[260] Having the inventor more involved in the process of applying for and acquiring the patent may enhance these benefits by increasing the inventor's sense of ownership of, and investment in, her patented invention. Feelings of competence at work are known to inspire intrinsic motivation among employees, leading to even more accomplished and creative work.[261] Thus, while having inventors more involved in the patent application process may decrease productivity in the sense that it takes minutes away from inventors that might otherwise be spent innovating, it may more than make up for these lost minutes by boosting the motivation and creative force of employed inventors.

D. Burden on Small Entities

The reforms suggested here require a somewhat more involved initial application process. Attorneys or agents may have to spend more time with inventors soliciting responses to answers about claim scope. This additional investment might pose an outsized burden on individual inventors and small entities, for whom acquiring a patent is already a costly endeavor.

This burden can be mitigated, however. First, the PTO has instituted a program to assist individual inventors and small entities with some of the costs of prosecuting a patent—specifically, the filing fees.[262] While this program does not help with attorneys' fees, it does reduce the overall costs of applying for a patent for small entities.[263]

Moreover, it is entirely possible that these reforms end up lowering the average total cost of applying for a patent by reducing attorneys' fees overall. While an attorney or patent agent may spend more time upfront preparing the initial application, that time investment could be recouped many times over in the form of a less involved prosecution process. For example, if the patent applicant is

258. *See* 35 U.S.C. § 118.

259. *See* Bair, *supra* note 256, at 773.

260. *See, e.g.*, Jonas Anderson, *Nonexcludable Surgical Method Patents*, 61 WM. & MARY L. REV. 637, 669–77 (2020); Laura Pedraza-Fariña, *Constructing Interdisciplinary Collaboration: The Oncofertility Consortium as an Emerging Knowledge Commons*, *in* GOVERNING MEDICAL KNOWLEDGE COMMONS 259, 276, 283 (Strandburg, Frischmann & Madison eds., 2017).

261. Bair, *supra* note 256, at 734–35.

262. *See* 13 C.F.R. § 121.802(a).

263. *Id.*

prompted in the ways discussed to draft a claim with appropriate scope that meets the enablement and written description requirements, there will likely be less back-and-forth between the examiner and the applicant's attorney over whether the claims do in fact meet these requirements. A final determination of whether the claims meet other patentability requirements should be easier to come by as well. Because, for example, the prompts encourage patent drafters to explain what they are claiming with specificity, to the extent that the prompts are successful, the definiteness requirement will most likely be met. And because the applicant is required to point out exactly what embodiments she has invented (along with those she additionally lays claim to via enablement), it should be somewhat easier to determine whether these claimed embodiments are a non-obvious advance over the prior art. Thus, while a patent attorney may spend more time on an initial patent application, bumping up hourly attorneys' fees as compared to the current status quo, total attorneys' fees may be lower thanks to a smoother prosecution process and less negotiation with the patent office, thereby easing the financial burden on small entities.

E. How This Proposal Fits with Previous Calls for Reform

Perhaps the best feature of the suggestion for reform I have made here is the fact that it is compatible with many of the myriad previous proposals put forth in the literature for improving the scope and clarity of patent claims. As outlined above, scholars have suggested a number of mechanisms for doing so, including having courts consider validity at *Markman* hearings,[264] shifting more fact-finding power from the Federal Circuit to the trial courts,[265] devoting more resources to the patent office[266] and having that office enforce more stringent standards of patentability,[267] recording examiner interviews,[268] reforming the continuations process,[269] encouraging standardized language in patent drafting,[270] and even imposing criminal sanctions for overclaiming.[271] My suggested reforms to the application process could be implemented along with any or all of these. Indeed, the more good ideas are implemented, the closer policymakers will get to achieving the goal of reduced patent gaming and clearer, appropriately broad patents that effectuate the innovation-promoting function of the patent system.

264. Lemley & McKenna, *supra* note 13, at 2268–69.

265. Rai, *supra* note 9, at 1046–49.

266. Frakes & Wasserman, *supra* note 138, at 1020–21.

267. Menell & Meurer, *supra* note 66, at 33; Cotropia, *supra* note 116, at 1907–08; Seymore, *supra* note 67, at 642–43; *see also* Kesan, *supra* note 14, at 770–76; Liivak, *supra* note 69, at 1872–74.

268. Menell & Meurer, *supra* note 66, at 33–34.

269. Lemley & Moore, *supra* note 14, at 101–18.

270. *See* Menell & Meurer, *supra* note 66, at 33–34; Freilich & Kesan, *supra* note 16, at 240–58; Surden, *supra* note 16, at 1809–20.

271. Liivak, *supra* note 16, at 1419.

VII. CONCLUSION

When patent applicants overclaim and patent boundaries are unclear, society suffers. Many prominent IP scholars have proposed patent examination- and litigation-stage interventions to help remedy these problems. Here, I tackle the problem at an earlier point—when patent claims are drafted. Drawing from the recent work of social psychologists and tax scholars, I propose simple changes to the patent application process that should reduce strategic behaviors by patent owners, enhance the clarity of patent boundaries, and promote a more efficient patent system.