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A Program to Improve the Efficiency and Quality of Patent Examination

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A Program to Improve the Efficiency and Quality of Patent Examination

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Abstract: In this article we suggest three novel amendments to U.S. patent law to increase efficiency and decrease costs. We first contend that while the assertion of invalid patents is detrimental because of anticompetitive effects, such competition concerns should place no duty upon applicants to disclose prior art at the outset. Additionally, we argue that to avoid resource waste, the USPTO should outsource prior art searches for certain applications, as in Japan. Finally, we propose a system where patentees have the option to elect to a patent box regime that reduces their taxes on patent profits substantially (e.g., from 21% to 5%), but requires patentees to pay the USPTO a modest percentage (e.g., 2%) of their profits annually, in lieu of flat periodic maintenance fees. Implementing these changes, or suitable alternatives based on the underlying principles of these changes, will help the USPTO issue deserving inventors more durable patent rights to compete in the global market.

Keywords: patents, prior art, patent box, duty to disclose, outsourcing, patent quality

JEL Classifications: O31, O34, O38

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I. INTRODUCTION

This paper contributes to the literature on innovation and patent policy. Our suggested changes should improve the quality and efficiency of patent examination, and mitigate the issuance of so-called “low-quality patents”. Certainly, for decades at the USPTO, low-quality patents have allegedly been a problem,¹ taking a toll on patent value.² Formally, a patent confers the right to exclude others from making or using an invention. But realistically today, a patent merely confers the right to *try* to exclude others by asserting the patent in court.³ Patents are issued as a necessary means to stimulate innovation, yet many patents are subject to invalidation, often due to oversights during the examination process. Low-quality patents have been said to “curtail future innovation, unnecessarily limit market activities and unduly create welfare reducing market power.”⁴ Additionally, low-quality patents purportedly lead to higher assertion rates by non-practicing entities (patent trolls).⁵ They generate excessive litigation costs and advantage those who can afford to pay such costs.⁶ Furthermore, when patent quality is perceived as low, the value of holding patents is as well.⁷ If low-quality patents continue to harm innovation, competition, and encourage bad-faith patent litigation, they will eventually become a pressing social issue.⁸

Although some commentators have become complacent with this reality, we are approaching it as a problem that can and should be solved, or at least mitigated substantially. As reports have recently emerged indicating that the U.S. lags behind other countries in innovation output, there is growing concern among innovators as well as Congress, that the USPTO needs to

¹ Compare Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1495 (2001) (reporting two decades ago in 2003, “The PTO has come under attack of late for failing to do a serious job of examining patents, thus allowing bad patents to slip through the system”); with Michael J. Meurer, *Patent Examination Priorities*, 51 WM. & MARY L. REV. 675, 677 (2009); Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 982 (2019) (“There is widespread belief that the Patent Office issues too many “bad” patents that impose significant harms on society.”)

² Beth Simone Noveck, *Peer to Patent: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J.L. & TECH. 123, 123 (2006) (“Low quality patents generate excessive litigation and confer the economic rewards of monopoly on patent holders while providing little benefit to the public.”).

³ See Mark Lemley & Carl Shapiro, *Probabilistic Patents*, 19 JOURNAL OF ECONOMIC PERSPECTIVES 75, 75 (2005).

⁴ See Vidya Atal & Talia Bar, *Prior Art: To Search or Not to Search* 28 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 507, 507 (2010).

⁵ See *id.*

⁶ See *id.*; The Impact of Bad Patents on American Businesses, House Committee on the Judiciary, Nadler, <https://www.youtube.com/watch?v=VaJpVmsLO6U> (articulating how bad patents “inject[] uncertainty into the market and imposes potentially huge costs on businesses and small inventors by requiring legal action to resolve claims of ownership” and arguing we must reduce the number of bad patents granted by USPTO).

⁷ See Vidya Atal & Talia Bar, *Patent Quality and a Two-Tiered Patent System*, THE JOURNAL OF INDUSTRIAL ECONOMICS 503, 504 (2014).

⁸ Charles A.W. DeGrazia, *Examination incentives, learning, and patent office outcomes: The use of examiner’s amendments at the USPTO*, 50 RESEARCH POLICY 1, 1 (2021); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763 (2002) (outlining social costs of bad patents as “(a) opportunistic licensing royalties/fees (including cross-licensing) collected from licensors who may rationally settle for a license instead of resorting to protracted litigation; (b) the disincentive to downstream innovation, i.e., the social cost of abandoned research activities by the patentee’s competitors who may fear infringement; (c) the cost of wasteful designing-around activities by competitors; (d) the cost of rent-seekers, such as venture capital financiers, who may choose to invest in start-up companies based on bad patents, thereby taking away resources from genuine entrepreneurs; (e) the social cost of supra-competitive pricing, in the absence of non-infringing product substitutes, based on bad patents; and (f) the filing and prosecution costs and the subsequent cost of having the courts fix the Patent Office’s oversights.”)

improve patent quality, and with a sense of urgency.⁹ As Congressman Russell Fry explained during the April 2023 House Committee Hearing on the Oversight of the USPTO, patents issued by the USPTO are proving to be increasingly less enforceable.¹⁰ Congressman Fry argued, therefore, that meaningful reforms are needed to “wake up [the U.S. patent system] and ensure the U.S. remains competitive with other countries”—especially China.¹¹ As of August 2023, there are approximately 750,000 unexamined utility, plant, and reissue (UPR) patent applications awaiting to receive a First Office Action by a USPTO examiner.¹² This is the highest pendency period in well over two years.¹³ Many have argued that the U.S. patent system is broken. We agree that improvements are necessary.

In this article, we propose three changes that should help improve the efficiency and quality of patent examination. Our suggestions focus on the following areas: (1) the patent applicant’s duty to disclose, (2) prior art searching, and (3) taxes and fees charged. Specifically, *we propose that applicants should be completely relieved of the duty to disclose prior art, or in other words, that Rule 56 should be abolished.* The rationale for this proposal, in a nutshell, is that the assertion of an invalid patent is harmful, in the end, because of its anticompetitive effects, but such competition concerns should place no duty upon a patent applicant at the outset. In addition, we outline several issues with the current prior art search system and *suggest the U.S. outsource prior art searches for certain applications*, as in Japan. The underlying rationale for this proposal is the efficiency goal: to construct the patent awarding process in a manner that avoids the waste of resources. Lastly, *we propose a novel tax and fee system where patentees have the option to elect to a patent box regime that reduces their taxes on patent profits from 21% to 5%, but requires the patentee to pay the USPTO 2% of their profits on a yearly-basis, in lieu of flat periodic maintenance fees.* In other words, our final proposal would introduce the principle of progressivity into the fee system for patents.¹⁴ Implementing these three changes, or some suitable approximations based on the underlying principles, will help the USPTO issue deserved inventors more durable patent rights that will withstand competition in the global market.

Our proposals can be distilled into some simple aphorisms that should be applied to the U.S. patent system. First: Do not attempt to draw blood from stones. The patent system is designed to encourage innovators to seek monopolies, and they will presumably do so with a strong desire for success. Given this, the patent system should not also assume that those patent applicants will take an objective approach to revealing the flaws of their own applications. Second: Do not attempt to mix oil and water. Antitrust is to patent law as water is to oil. The two legal regimes

⁹ Ian Clay & Robert D. Atkinson, *Wake Up, America: China Is Overtaking the United States in Innovation Capacity*, Innovation Capacity, Jan. 23, 2023, <https://itif.org/publications/2023/01/23/wake-up-america-china-is-overtaking-the-united-states-in-innovation-capacity/#>; Oversight of the U.S. Patent and Trademark Office, House Committee on the Judiciary (Apr. 27, 2023), <https://www.youtube.com/watch?v=Zu0x6GGRqbM>.

¹⁰ Oversight of the U.S. Patent and Trademark Office, House Committee on the Judiciary (Apr. 27, 2023), <https://www.youtube.com/watch?v=Zu0x6GGRqbM>.

¹¹ *See id.*

¹² Patents Production, Unexamined Inventory and Filings Data August 2023, USPTO, <https://www.uspto.gov/dashboard/patents/production-unexamined-filing.html> (last accessed Oct. 1, 2023).

¹³ *See id.*

¹⁴ Our proposal is based on Hylton, Keith N., A Patent and a Prize (February 8, 2023). Boston Univ. School of Law Research Paper No. 23-7, available at SSRN: <https://ssrn.com/abstract=4351974> or <http://dx.doi.org/10.2139/ssrn.4351974>, forthcoming in the *Review of Law and Economics*.

should be kept separate. Third: Do not attempt to “feed pearls to swine”.¹⁵ Rather than showering more rules and resources onto the existing patent examination process, try instead to infuse market incentives where possible to induce more efficient practices in the patent examination process. Fourth: Do not forfeit a pound to save a penny. The tax system can be optimized to enhance innovation incentives. Our custom is to look at the corporate tax as a source of revenue. But if we can lower in some instances and enhance the economy substantially as a consequence, we should do so. The patent box offers such an opportunity.

The paper proceeds as follows. In Part II we explain why patent applicants should be relieved of the duty to disclose prior art. We address why concerns about myopia should be dismissed, and why relieving the duty to disclose will reduce unnecessary costs, both at the front and at the back end by simplifying rules whose complexity generates litigation. In Part III, we argue that the USPTO should outsource prior art searches for a large subset of applications as this will allow better efficiency due to: (1) specialization coupled with the division of labor, and (2) the enhanced incentives within the private sector to adopt new technologies that improve efficiency. In Part IV, we argue that the U.S. should adopt a patent box, as other countries have, and a progressive maintenance fee system. The overall net welfare benefit from the patent system will increase due to the patent box, and the maintenance system will provide more opportunity for the USPTO to invest in several aspects of the examination process, as we will discuss. In Part V, we conclude.

II. RELIEVING PATENT APPLICANT’S DUTY TO DISCLOSE

Under 37 C.F.R. §1.56 (“Rule 56”), patent applicants have a duty of candor and good faith to disclose to the USPTO all material prior art known to them.¹⁶ Importantly, while Rule 56 requires applicants to disclose prior art that the applicant and their attorney are aware of, it does not impose a duty to search for prior art.¹⁷ The underlying policy for Rule 56 is that “the applicant is in the best position to have full knowledge of the art and disclosure of this information leads to higher quality examination,” which in turn benefits the public interest.¹⁸ The duty to disclose applies throughout the entire prosecution process. Thus, applicants must disclose material art they become aware of even after applying for a patent.¹⁹ The USPTO enforces Rule 56 by requiring applicants to submit an information disclosure statement (IDS). The IDS calls on the applicant to disclose all relevant prior art known to them and other information material to the patentability of their invention. If an applicant violates Rule 56 then the applicant may be susceptible later to inequitable conduct and antitrust counterclaims by accused infringers in court.

Applicants tend to approach Rule 56 through two different strategies, often depending on the industry in which they operate. In some cases, applicants react to Rule 56 in two extremes:

¹⁵ The quote refers to a verse from Jesus' sermon on the mount: Matthew 7:6 — “Do not give dogs what is sacred; do not throw your pearls to pigs. If you do, they may trample them under their feet, and turn and tear you to pieces.”

¹⁶ 37 C.F.R. § 1.56(a) (2006)

¹⁷ See Vidya Atal & Talia Bar, Prior Art: To Search or Not to Search 28 International Journal of Industrial Organization 507, 507-508 (2010).

¹⁸ Daniel Parrish, *Supplemental Examination and Inequitable Conduct: Protection and Pitfalls*, 4 Mitchell Hamline School of Law Cybaris 151, 157 (2013).

¹⁹ Christopher A. Cotropia & Mark Lemley, *Do applicant patent citations matter?* 42 Research Policy 844, 848 (2013).

(1) *burying* the examiner by disclosing excessive references to hide important ones among irrelevant ones and without explaining the significance of the references,²⁰ or (2) *remaining deliberately ignorant* and citing few or no references (in some cases, applicants fail to cite their own relevant patents).²¹ The former, burdens the examiner with an overwhelming volume of irrelevant art, makes patent examination more costly and time-consuming.²² The goal of burying is to disclose so much that the examiner will not be able to ascertain what references truly are material. By doing so, the applicant is less likely to violate Rule 56 because they included the material reference at issue, albeit among a large volume of immaterial references.²³ The Federal Circuit held in *Molins PLC v. Textron, Inc.* that burying a material reference is not strong evidence of intent to deceive the USPTO.²⁴ The latter strategy, that of deliberate ignorance, discourages inventors from understanding patent boundaries.²⁵

We argue that applicants should not have a duty to disclose prior art, period. The U.S. is one of the few countries with any type of disclosure duty, and there are multiple reasons to abolish Rule 56. The first is that Rule 56 doesn't make a material difference. Empirical research has shown that in most applications, examiners do not use applicant patent citations and instead rely almost exclusively on prior art they locate themselves.²⁶ While Rule 56 is based in the idea that patent applicants should assist the USPTO in performing its job of determining whether the invention disclosed in the application is patentable,²⁷ because examiners rarely rely on applicant-submitted citations anyway, requiring applicants to disclose prior art imposes an unnecessary burden of time and cost. This is inefficient, as these efforts ultimately do not contribute much to the ex parte examination of the applicant's patent.

Cotropia & Lemley (2013) find that examiners rarely rely on applicant-submitted prior art, and that examiners are also less likely to use prior art discovered by foreign examination authorities, despite this art likely being of high quality.²⁸ The authors credit this phenomena to "myopia," which occurs when people are more inclined to depend on what they do, or in this

²⁰ Bhaven N. Sampat, *When Do Applicants Search for Prior Art*, 53 J.L. & ECON. 399 (2010); Christopher Cotropia et. al, *Do applicant patent citations matter?*, 42 RESEARCH POLICY 844, 844 (2013); *Therasense*, 649 F.3d at 1289 ("With inequitable conduct casting the shadow of a hangman's noose, it is unsurprising that patent prosecutors regularly bury PTO examiners with a deluge of prior art references, most of which have marginal value."); *The Case for Eliminating the Inequitable Conduct Defense*, Columbia Law Review, <https://columbialawreview.org/content/the-case-for-eliminating-patent-laws-inequitable-conduct-defense/>; Robert Brendan Taylor, *Burying*, 19 MICH. TELECOMM. & TECH. L. REV. 99, 113–14 (2012) ("An applicant buries material prior art and reduces the likelihood that a USPTO examiner will read it by disclosing it with large quantities of immaterial prior art.").

²¹ Bhaven N. Sampat, *When Do Applicants Search for Prior Art*, 53 J.L. & ECON. 399 (2010).

²² Robert Brendan Taylor, *Burying*, 19 MICH. TELECOMM. & TECH. L. REV. 99, 101, 116 (2012).

²³ See generally Robert Brendan Taylor, *Burying*, 19 MICH. TELECOMM. & TECH. L. REV. 99, 101, 116 (2012).

²⁴ See *Molins PLC v. Textron, Inc.*, 48 F.3d 1172.

²⁵ See generally, James Bessen & Michael Meurer, *Patent Failure: How Judges, Bureacrats, and Lawyers Put Innovators at Risk* (2008).

²⁶ Christopher Cotropia et. al, *Do applicant patent citations matter?*, 42 Research Policy 844, 844 (2013) (discussing key role of prior art search and revealing inefficiency of current system that imposes burden on applicant to submit art as examiners rarely consult submitted art and instead rely on their independent findings); Bhaven N. Sampat, *When Do Applicants Search for Prior Art*, 53 J.L. & ECON. 399 (2010) (finding that "patent examiners did not use applicant-submitted art in the rejections that narrowed claims before these patents issued, relying almost exclusively on prior art they find themselves.")

²⁷ Jay Erstling, *Patent Law and the Duty of Candor: Rethinking the Limits of Disclosure*, 44 CREIGHTON L. REV. 329, 330 (2011); Paul M. Janicke, *Do We Really Need So Many Mental and Emotional States in United States Patent Law?* 8 Tex. Intell. Prop. L.J. 279, 292 (2000); Christopher A. Cotropia & Mark Lemley, *Do applicant patent citations matter?* 42 Research Policy 844, 844 (2013) (explaining that idea behind duty of disclosure is that "applicants should help patent examiners decide whether an invention is patentable by submitting what is likely to be the most relevant information.")

²⁸ Christopher Cotropia et. al, *Do applicant patent citations matter?*, 42 Research Policy 844, 844 (2013).

case, find, themselves.²⁹ They conclude that “if examiners discount submitted art in preference to ones they find themselves, it’s not clear that we even want applicants submitting key pieces of prior art; we may get a better examination if examiners find the art themselves.”³⁰ In addition to this compelling observation, we contend it is inefficient to impose upon applicants the burden of submitting an IDS when there is convincing evidence that it ultimately will not impact the outcome of their patent application. Searching for prior art is a particularly costly aspect of the prosecution process simply because it is very time intensive. Law firms will often pay third-party non-law firms to conduct prior art searches. This should be streamlined. As we will detail in Part III, it would be more efficient from both a cost and time perspective, for the USPTO to work directly with the many existing search firms as opposed to the current scenario.³¹

While the precise reason patent examiners tend to rely on their own search efforts rather than those of the patent applicant is not necessary for us to resolve in this paper, we believe that myopia – if it exists at all – is unlikely to be the key factor. The most obvious factor is the incentive structure of the patent system. Obviously, patent applicants want to be successful. The desire for success most likely impels them to view their own prospects for obtaining a patent with a favorable bias. Such a favorable bias is likely to infect every step of the patent application process. It is likely to cause patent applicants to lean toward dismissing prior art that seems to anticipate their innovative work. If there is uncertainty about whether the prior art really anticipates their efforts, they are likely to interpret it as falling short of anticipatory. This is all predictably human behavior. Patent examiners, realizing that applicants are likely to be biased in this manner, would rationally compensate for that bias by putting little weight on the submissions of the applicants. In other words, the tendency of examiners to rely on their own search efforts rather than those of applicants is a predictably rational equilibrium in the patent application process. In a similar vein, no rational tax authority would rely completely on the voluntary submissions of the taxpayer. To do so would incentivize every taxpayer to under-report their earnings. There is no need to rely on a concept such as myopia to explain why tax authorities attempt to discover through their own methods ways to determine the income reports of the taxpayers. Similarly, there is no need to rely on a concept such as myopia to explain why patent examiners tend to rely on their own search efforts.

The second reason for abolishing the Rule 56 duty to disclose is that eliminating the applicant’s duty to disclose would reduce unnecessary costs, both at the front end, by relieving patentees of the risk that an inadequate disclosure will cause them to face inequitable conduct and antitrust counterclaims later during litigation, and at the back end by simplifying rules whose complexity generates litigation.³² These claims effectively force the patentee, in litigation, into re-examination, a process plagued with cost and uncertainty.³³

²⁹ See *id.*

³⁰ See *id.* at 852.

³¹ Existing search firms include CPA Global, Clarivate Analytics, Cardinal IP, Babaria IP & Co., LexOrbis, DexPatent, Invn Tree, Menteso Inc., Synoptic IP, Sagacious IP, Prior Art Searchers, Stellarix, and IP Metrix.

³² As will be explained, relieving the duty to disclose will eliminate *Walker Process* claims, but *Handgards* claims will remain viable.

³³ See Christopher A. Cotropia, *Modernizing Patent Law’s Inequitable Conduct Doctrine*, 24 Berkeley Tech. L.J. 723, 740 (2009) (explaining that “litigation of inequitable conduct claims is particularly costly”).

It is important here to separate two types of cost associated with inequitable conduct and antitrust counterclaims. One type of cost is incurred upfront in the patent application process as a result of the applicant's fear of facing inequitable conduct and antitrust claims later. This fear will induce the applicant to alter his strategy in a manner that forces additional costs onto the patent examination process. For example, the strategy of burying forces additional costs onto the patent examination process. Similarly, the strategy of deliberate ignorance forces additional costs onto the patent examination process. These are costs borne in part by the patentee and in greater part by the public. The second type of cost incurred by the patent application arises later on with the initiation of inequitable conduct and antitrust counterclaims by defendants.

Let us consider these two types of counterclaim separately – first antitrust counterclaim costs, and second inequitable conduct counterclaim costs.

Antitrust Counterclaims

Regarding costs for antitrust counterclaims, such costs are largely independent of the disclosure conduct of the patent application. The antitrust counterclaim is, in essence, a claim that the patent is invalid, that the patentee knows that it is invalid, and that the patent is therefore being used by the patentee for the sole purpose of excluding competition rather than recouping the costs of genuine invention. This is a claim that applies directly to the patentee's infringement action, and not so much to the patentee's initial application, perhaps years in the past, for the patent award. Thus, the patent defendant's antitrust counterclaim really has almost nothing to do, at bottom, with the patentee's behavior before the patent authority. The patent defendant's counterclaim is equally valid in the case where the patentee acted with perfect rectitude in the application process, but the patent authority mistakenly granted the patent, and the patentee later became aware of the mistake but yet continued to assert the patent. Given this orthogonality between the patent defendant's antitrust counterclaim and the patentee's conduct before the patent board as an applicant, there is no reasonable basis for using antitrust law to attempt to regulate the patent applicant's conduct before the patent before. In short, antitrust law imposes and *should only impose* antitrust conduct duties. It should not impose patent conduct duties. We therefore contend that antitrust law should not concern itself with the conduct of the patent applicant.

Furthermore, the attempt to use antitrust law to regulate the conduct of the patent applicant creates unnecessary and entirely avoidable costs at the patent application stage, both for patent applicants and for the public (the taxpayer). Such costs may deter innovators—especially small businesses who cannot pay potential litigation costs—from utilizing patent protection.³⁴ Additionally, such litigation wastes time and resources that firms should spend in R&D and other more productive avenues.

To summarize our position, we are not saying that antitrust counterclaims to patent infringement suits should be abolished. Antitrust, as a mechanism for discouraging monopolization, is well entrenched in the law and can serve a socially valuable function. The knowing assertion of an invalid patent is certainly a method a monopolization, and therefore

³⁴ House Small Business Committee Hearings and Meetings, May 15, 2013, <https://www.congress.gov/committees/video/house-small-business/hssm00/hMAUGHBC2Iw>.

should be subject to the antitrust laws. However, the antitrust laws can effectively serve this socially valuable regulatory function without attempting to regulate the conduct of patent applicants. We consider more specifics of our argument next: the *Walker Process* counterclaim and the *Handgards* counterclaim.

Walker Process

Specifically, abolishing Rule 56 will forbid accused infringers from bringing *Walker Process* claims against patentees. A *Walker Process* claim is based in fraud and carries a heavier burden of proof than an inequitable conduct claim. Broadly speaking, a successful claim requires proof of the following: (1) the antitrust defendant enforced a patent that was obtained upon knowing and willful fraud on the USPTO; and (2) the antitrust plaintiff meets the Sherman Act's requirements for establishing an antitrust claim (they monopolized or attempted to monopolize the relevant market).³⁵ Courts apply the following four-factor test when presented with a *Walker Process* claim: "(1) the patentee obtained a patent by knowingly and willfully misrepresenting material facts to the PTO (or omitting to state material facts), (2) the patentee acted with intent to deceive the PTO, (3) the PTO justifiably relied on the misrepresentation or omission, and (4) the patent would not have issued but for the misrepresentation or omission."³⁶ Proving these elements establishes antitrust liability. Of course then, without antitrust protection, the patentee will no longer receive exemption from antitrust laws, as good-faith patent holders do. This will allow the opposing party to obtain treble damages under either or both sections four or sixteen of the Clayton Act. Since failure to establish inequitable conduct claims moots antitrust claims,³⁷ it is standard practice for courts to bifurcate under Rule 42(b) of the Federal Rules of Civil Procedure, first deciding the inequitable conduct defense first, and then if and only if, the accused infringer successfully asserts the defense, then addressing the antitrust claim.

Because prevailing on a *Walker Process* claim requires showing that the patentee committed fraud to the PTO, abolishing the applicant's duty to disclose prior art will eliminate the availability of *Walker Process* counterclaims to accused infringers. Asserting a successful *Walker Process* claim requires circumstantial evidence. This involves substantial discovery—the most expensive part of litigation.³⁸ This is money that could be spent on R&D and other more productive forms of spending. The jurisdictional rules of *Walker Process* claims remain fuzzy. Even sixty years after the Supreme Court decision that created *Walker Process* claims, the Federal Circuit and Fifth Circuit have yet to agree on whether jurisdiction of such claims belongs to the Federal Circuit or to other Courts of Appeal.³⁹ Especially in recent years, this has created a procedural headache for courts to sort out. Two cases in particular—*Xitronix Corp. v. KLA-Tencor Corp* and *Chandler v. Phoenix Services*—have brought this debate to light. And still,

³⁵ Gideon Mark & T. Leigh Anenson, *Inequitable Conduct and Walker Process Claims after Therasense and the American Invents Act*, 16 U. PA. J. Bus. L. 361, 397 (2014).

³⁶ See *id.* (citing *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1364 (Fed. Cir. 1998); accord *Nobelpharma*, 141 F.3d at 1069-70. These cases are examples of courts applying the four-factor test.

³⁷ Failure to successfully assert the inequitable conduct defense moots antitrust claims because the inequitable conduct analysis probes a lower standard for materiality and intent.

³⁸ Takenaka, & Takenaka, Toshiko. (2019). *Research handbook on patent law and theory* (Second edition.). Edward Elgar Pub., p. 392.

³⁹ Matthew Kraemer, "An Investigation of Jurisdictional Debates Concerning Walker Process Claims," AMERICAN BAR ASSOCIATION, May 25, 2023 https://www.americanbar.org/groups/antitrust_law/resources/newsletters/investigation-jurisdictional-debates-walker-process-claims/.

neither case settled the debate. As the Federal Circuit explicitly stated in the more recent *Chandler v. Phoenix Services* case, their decision did not mandate exclusive Federal Circuit jurisdiction over all cases involving a *Walker Process* claim. Abolishing the duty to disclose will alleviate courts from the burden of spending additional time and resources on this debate. Thus, relieving the duty to disclose eliminating *Walker Process* claims altogether will put to rest an area of law that never established jurisdictional footing.

Given the threat of treble damages based specifically on the conduct of the patentee when it went through the patent application process, the *Walker Process* counterclaim is likely to impart a strong biasing effect on the conduct of the patent applicant. Foreseeing the potential cost of treble damages down the road, the patent applicant is likely to be induced to adopt one of the two aforementioned strategies of burying the examiner or deliberately pretending ignorance. Again, both of these strategies impose costs on the patent examiner (and as a result, the public). Moreover, the potential costs may deter some patent applicants. Finally, the difficulty in the courts of managing *Walker Process* litigation clearly imposes significant costs on the public in post-patent-award stages when litigation actually breaks out. For all of these reasons, the *Walker Process* doctrine probably does more harm than good.

Handgards

Although eliminating the duty to disclose will make *Walker Process* claims no longer viable, it will not put an end to the threat of antitrust counterclaims against patentees. Specifically, eliminating the disclosure duty will not affect the viability of *Handgards* claims. The *Handgards* doctrine establishes the following set of rules. (1) *No market power*: If a patentee does not have market power (“power to set price above the competitive level without constraint of competition”),⁴⁰ and sues with an invalid patent, and the defendant is able to prove it, then two potential scenarios emerge. First, it is possible that the patentee was unaware their patent was invalid, so he simply loses his infringement claim. Second, it is possible the patentee knew its patent was invalid, so it lose its claim *and* is subject to tort damages for a bad faith lawsuit. (2) *Market Power*: However, if the patentee does have market power, then it will be subject to *Handgards* antitrust liability for treble damages. Additionally, state tort laws such as common law fraud, malicious prosecution, and related offenses will remain available. Therefore, even without *Walker Process* Claims, there will still be antitrust pathways by which petitioners can hold patentees accountable for misconduct.

One might question why we would make a distinction between *Handgards* and *Walker Process* liability. Aren’t they both the same sort of antitrust liability? No. The difference is that *Handgards* is just traditional antitrust liability based on current monopolizing behavior. *Walker Process*, by contrast, looks back to the conduct of the patentee at the patent application stage. This difference is crucial to our argument, because *Handgards*, as traditional antitrust liability, does not create the distortions in incentives created by *Walker Process* liability. Specifically, *Handgards* liability is unlikely to distort incentives of the patent applicant with respect to disclosure because *Handgards* liability is unconnected to the patentee’s disclosure conduct before the patent authority.

⁴⁰ See Keith Hylton & Ronald Cass, LAWS OF CREATION: PROPERTY RIGHTS IN THE WORLD OF IDEAS 187 (2013).

Another way of making the same point is to consider the incentives of the patent applicant under the *Walker Process* and under the *Handgards* doctrines. Under *Walker Process*, the patent applicant must worry that its failure to adequately disclose could be the basis of, or at least a key element in, the imposition of treble damages in the future. Under *Handgards*, the patent applicant knows that it may be subject to antitrust liability later, but that liability will be based largely on its conduct in the market later, not on its disclosure conduct before the patent authority today. Thus, *Walker Process* is likely to distort incentives before the patent authority, while *Handgards* is unlikely to impart such a distortive effect.

Walker Process liability, in contrast to *Handgards* liability, creates an unfortunate and largely unnecessarily conflict in incentives before the patent authority. On one hand, the patent laws encourage innovators to seek patents, and offer rewards (in the form of market exclusivity) for successful patent applicants. To procure such an award, the patent applicant presumably will do almost everything in its power to prevail. The patent applicant is likely to operate under an optimistic, self-serving bias in considering all of the facts regarding such matters as prior art. The likely result of this bias is to exclude some matters that might be regarded as prior art, or to bury such matters in a mountain that makes them hard to see. Such incentives are to be expected, even on the part of some reasonably-minded patent applicants. On the other hand, *Walker Process* liability punishes the applicant ex post for some instances that may have been the sort of error induced by the incentives created by the patent system.

Although *Handgards* liability is clearly superior to *Walker Process* liability given the considerations offered here, it is certainly possible that *Handgards* liability goes too far when viewed in isolation. The imposition of treble damages on a patentee for the assertion of an infringement claim is likely to discourage the assertion of infringement claims. Any factor that discourages the assertion of infringement claims will tend to weaken the enforceability of a patent. Weakening the enforceability of a patent reduces the expected reward from the patent, and hence the expected reward from innovation. Reducing the expected reward from innovation will tend to reduce the incentive to innovate. It follows that imposing treble damages on patent infringement plaintiffs may – and indeed is likely to – reduce innovation. Since innovation is important for the expansion of competitive markets, a policy of imposing treble antitrust damages on patent infringement plaintiffs may have the perverse effect of making markets less competitive and less efficient in the long run, harming consumers.

Perhaps the optimal level of liability in this setting is single damages rather than treble damages. This is an empirical question. However, it is not our goal to attempt to answer the optimal liability question here. Our point is to take the doctrine as it stands, and to offer reasonable modifications that can be implemented immediately.

Inequitable Conduct Counterclaims

In the same sense as just described, inequitable conduct liability creates a conflict in incentives. The patent applicant is likely to work assiduously toward obtaining the patent award, and that motivation may cause the patentee to view matters of prior art in a self-serving fashion.

That is to be expected even of some reasonable actors who wish to obtain patents. On the other hand, inequitable conduct liability threatens punishment for acting on the very motivations and beliefs encouraged by the patent system.

An applicant could be held liable for inequitable conduct if he or she intentionally withholds material art or intentionally submits materially false information to the USPTO during the prosecution of the patent.⁴¹ Specifically, this requires evidence that “(1) an individual associated with the filing and prosecution of a patent application made an affirmative misrepresentation of a material fact, failed to disclose material information, or submitted false material information to the PTO; and (2) did so with the intent to deceive the PTO.”⁴² In 2011, the Federal circuit in *Therasense* weakened the inequitable conduct doctrine by tightening the standards for intent and materiality. Post-*Therasense*, prevailing on an inequitable conduct claim requires the accused infringer to prove with clear and convincing direct or circumstantial evidence that the patentee acted with specific intent in deceiving the PTO. To show this, the accused infringer must show that the applicant: (1) knew about the reference, (2) knew it was material, (3) and then made a deliberate decision not to disclose the reference to the PTO. To prevail, the intent to deceive must be “the single most reasonable inference able to be drawn from the evidence,” so if there are multiple possibilities for why the applicant did not disclose the reference, no specific intent may be found. Furthermore, the Federal Circuit in *Therasense* elevated the materiality to a “but for” analysis.⁴³ This means that to prove a reference withheld by an applicant is material, the defendant must show by a preponderance of the evidence that had the USPTO been aware of the undisclosed reference, the USPTO would not have issued the patent.⁴⁴ Although, there is an exception to but-for materiality when a patentee engages in affirmative acts of egregious misconduct. Additionally, the unclean hands doctrine remains available to accused infringers, as a separate defense.

Proponents of the inequitable conduct doctrine argue that the doctrine “[protects] the integrity of the patent system by ensuring applicant candor, encouraging patent applicants to internalize costs of the patent system, avoiding patent monopolies that stem from inequitable conduct, and punishing patentees who behave inequitably toward the public during the patent acquisition process.”⁴⁵ But we are inclined to agree with critics who say that defendants are overusing the doctrine.⁴⁶ Prior to *Therasense*, an inequitable conduct claim was tethered to

⁴¹ Willkie Farr & Gallagher LLP, Federal Circuit Further Defines What is Required to Bring a Successful Walker Process Claim, https://www.willkie.com/-/media/files/publications/2007/04/federal-circuit-further-defines-what-is-required-/files/federalcircuitfurtherdefinespdf/fileattachment/federal_circuit_further_defines.pdf; Gideon Mark & T. Leigh Anenson, *Inequitable Conduct and Walker Process Claims after Therasense and the American Invents Act*, 16 U. PA. J. Bus. L. 361 (2014).

⁴² Gideon Mark & T. Leigh Anenson, *Inequitable Conduct and Walker Process Claims after Therasense and the American Invents Act*, 16 U. PA. J. Bus. L. 361 (2014).

⁴³ *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276; Gideon Mark & T. Leigh Anderson, *Inequitable Conduct and Walker Process Claims After Therasense and the America Invents Act*, 16 U. of Pennsylvania Journal of Business Law 361, 376 (“The Federal Circuit’s decision in *Therasense* imposed significant limitations on potential use of the inequitable conduct defense. These limitations included, but were not restricted to, the adoption of elevated standards for intent and materiality.”);

⁴⁴ *Therasense v. Becton, Dickinson and Co.*, 649 F.3d 1276; Arpita Bhattacharyya & Michael R. McGurk, *IDS Practice after Therasense and the AIA: Decoupling the Link between Information Disclosure and Inequitable Conduct*, 29 Santa CLARA COMPUTER & HIGH TECH. L. J. 605 (2012).

⁴⁵ Gideon Mark & T. Leigh Anderson, *Inequitable Conduct and Walker Process Claims After Therasense and the America Invents Act*, 16 U. of Pennsylvania Journal of Business Law 361, 364.

⁴⁶ John O. Curry, *Avoiding Responsibility: The Case for Amending the Duty to Disclose Prior Art in Patent Law*, 95 Wash. L. REV. 1031 (2020).

nearly every single patent infringement lawsuit.⁴⁷ Unlike other infringement defenses which require an analysis of each claim, inequitable conduct is a global defense, meaning that if a court finds that an applicant has engaged in inequitable conduct, they will declare the patent unenforceable for the rest of its term.⁴⁸ Sometimes, this finding can also invalidate other patents in the patent family.⁴⁹ Thus, it is no mystery as to why the Federal Circuit has referred to the inequitable conduct doctrine as an “atomic bomb.”⁵⁰ As opined by the *Therasense* majority, “Left unfettered, the inequitable conduct doctrine has plagued not only the courts but also the entire patent system.”⁵¹ Since *Therasense* heightened the burden of proving intent and materiality, it has become more difficult for accused infringers to prevail on the defense. Nonetheless, accused infringers continue to assert the defense because there is still strategic litigation value to bringing inequitable conduct claims after *Therasense* since “[t]he defense may still help many defendants achieve an off-the-merits victory, either by getting a plaintiff to accept a less favorable settlement in anticipation of swollen litigation costs or by tilting the factfinder against the plaintiff at trial by filling the air with allegations of dishonest behavior.”⁵² Furthermore, the value in bringing inequitable conduct claims was reinforced to some extent by the 2020 Federal Circuit decision, *GS CleanTech Corp. v. Adkins Energy LLC*,⁵³ which held four patents unenforceable due to inequitable conduct when the patentee failed to disclose information that would have implicated the on-sale bar.⁵⁴ The Federal Circuit reasoned that the patentee took affirmative steps to hide this fact from the USPTO and allowed its attorney to file a false affidavit.⁵⁵

Eliminating the applicant’s duty to disclose will further limit the inequitable conduct defense even more than it is post-*Therasense*.⁵⁶ We view this as a positive step, because it would reduce unnecessary costs in the same manner as elimination of the Walker Process doctrine. Indeed, the inequitable conduct doctrine and the Walker Process doctrine are essentially the same, except that inequitable conduct leads to the “atomic bomb effect”, while Walker Process leads to the imposition of treble damages. Both are probably excessive in their discouraging effect on innovation incentives.

Indeed, if one looks closely at the inequitable conduct doctrine, it is, in essence, an antitrust theory dressed up as a patent doctrine. Its aim is to avoid “patent monopolies that stem from inequitable conduct”.⁵⁷ The reason society should desire to avoid such monopolies is because

⁴⁷ Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1502 (2001) (“Virtually every patent infringement lawsuit includes a claim that the patent is either invalid or unenforceable due to inequitable conduct (or commonly both).”); *Therasense*, 649 F.3d at 1288–89 (“[T]he taint of a finding of inequitable conduct can spread from a single patent to render unenforceable other related patents and applications in the same technology family.”).

⁴⁸ Jay Erstling, *Patent Law and the Duty of Candor: Rethinking the Limits of Disclosure*, 44 CREIGHTON L. REV. 329, 330 (2011); <https://ipwatchdog.com/2019/04/03/inequitable-conduct-unclean-hands-difference-matter/id=107897/>

⁴⁹ *See id.*

⁵⁰ *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276

⁵¹ *See id.* at 1289.

⁵² *See* Eric E. Johnson, *The Case for Eliminating Patent Law's Inequitable Conduct Defense*, 117 COLUM. L. REV. ONLINE 1, 16 (2017).

⁵³ *GS CleanTech Corp. v. Adkins Energy LLC*, Case Nos. 2016-2231, 2017-1838 (Fed. Cir. 2020).

⁵⁴ *See id.*

⁵⁵ *See id.*

⁵⁶ John O. Curry, *Avoiding Responsibility: The Case for Amending the Duty to Disclose Prior Art in Patent Law*, 95 WASH. L. REV. 1031, 1032 (2020) (explaining how removing applicant’s duty to disclose prior art will decrease number of inequitable conduct claims).

⁵⁷ Gideon Mark & T. Leigh Anenson, *Inequitable Conduct and Walker Process Claims after Therasense and the American Invents Act*, 16 U. PA. J. BUS. L. 361, 364 (2014).

they are harmful to consumers, and presumably, because of their inequitable origin, not necessary to induce innovation. In our view, all of our arguments against *Walker Process* apply to the inequitable conduct doctrine.

It should be noted that one reason why the inequitable conduct defense has been deemed necessary by its proponents is that challenging patent validity was in the past not as accessible in the U.S. compared to other countries such as Japan and the EU.⁵⁸ While we take no position here on whether that is good or bad, with the emergence of the PTAB after the AIA, access to challenging patent validity is just as, if not more, accessible than foreign counterparts. Additionally, empirical research has shown that even before *Therasense*—before the materiality condition was raised even higher—the inequitable conduct defense was rarely successful.⁵⁹ Thus, the costs parties accrue in generating discovery coupled with its unlikely success suggests the inequitable conduct defense has primarily hindered patent enforcement litigation.

Critics of eliminating the duty to disclose may argue that eliminating the duty will weaken the presumption of validity that issued patents have. However, scholars have argued that even with the duty to disclose in force as it currently stands, patents enjoy a much stronger presumption of validity than they ought to.⁶⁰ And patents do not in fact have a presumption of validity at the PTAB. However, we should note that since applicants will no longer face the duty, nor the opportunity to disclose prior art, the patent citation research field will be impacted to some extent. Patent citation research relies on patent citation information in file wrappers to derive insights about two key areas: (1) how patent citations link inventions, inventors, and assignees across time and space, and (2) how citations are indicators of patent value.⁶¹ Since 2001, patent wrappers indicate whether the cited references were identified by the examiner or the applicant. This is thought to strengthen the first area of research because isolating applicant-identified art may speak to the behavior among inventors in terms of how prior art functions as building blocks for future inventions. While this may be true in some cases, empirical work has come to question the assumptions underlying this research.⁶² Thus, the benefits of eliminating the duty to disclose likely outweigh the impact doing so will have on this subset of patent research.

III. OUTSOURCING THE PRIOR ART SEARCH

Introduction

Technology has evolved immensely since the USPTO opened its doors nearly two centuries ago. Then, patentable subject matter primarily addressed agricultural technology and

⁵⁸ Gideon Mark & T. Leigh Anenson, *Inequitable Conduct and Walker Process Claims after Therasense and the American Invents Act*, 16 U. PA. J. Bus. L. 361, 397 (2014).

⁵⁹ Lee Petherbirdge, Jason Rantanen & Ali Mojibi, *The Federal Circuit and Inequitable Conduct: An empirical Assessment*, 84 S. Cal. L. Rev. 1293, 1295 (2011) (explaining that between 1983 and 2010 Federal Circuit only found proof of inequitable conduct 2.5 times per year on average).

⁶⁰ Lemley et. al., *What to Do about Bad Patents*, REGULATION 10, 12 (2005).

⁶¹ Juan Alcáer et. al., *Applicant and examiner citations in U.S. patents: An overview and analysis*, 38 Research Policy 415 (2009); David Abrams & Bhaven Sampat, *What's the Value of Patent Citations? Evidence from Pharmaceuticals* (June 9, 2017).

⁶² Christopher A. Cotropia & Mark Lemley, *Do applicant patent citations matter?* 42 Research Policy 844, 845 (2013).

simple everyday products.⁶³ Now, the possibilities for what qualifies as patent eligible subject matter have expanded tremendously.⁶⁴ Consequently, the prior art catalogue—which is essentially comprised of all materials in the history of the world that have ever been publicly disclosed prior to the application submission date—has inevitably expanded and will only continue to do so.⁶⁵ U.S. patent literature alone grows by over a million patents every two to three years.⁶⁶ Yet, examiners’ tools and processes for assessing prior art have not kept up. Applications flood the USPTO—much to the detriment of examiners.⁶⁷ Each application must be considered in light of existing prior art. This is a crucial task, as it involves locating and assessing materials that in the case of some patents—the economically significant ones—other parties will be doggedly searching for to invalidate the issued patent in future litigation, either in district court or at the Patent Trial and Appeals Board (PTAB).⁶⁸

The prior art search is the most time-consuming step in the examination process.⁶⁹ The primary goal of the search is to assure the disclosed invention is novel and non-obvious, two of the most important qualifications for an application. It creates the database the examiner will reference to decide whether the disclosed invention is patentable. During the search, oversights—instances where the examiner has failed to identify existing prior art that would invalidate the patent—can happen, and too often at the USPTO, they do. Oversights are significant because they contribute to “low-quality” patents that can later be invalidated through costly procedures in court or at the PTAB.

⁶³ <https://www.ipmall.info/content/patent-history-materials-index-brief-history-united-states-patent-office-its-foundation-1790#:~:text=The%20American%20patent%20system%20was,and%20the%20exclusive%20privileges%20that>; Robert P. Merges, *As Many as Six Impossible Patent before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 585 (1999) (remarking how during founding fathers’ lifetime “[a]gricultural and machinery was almost synonymous with ‘patents’” and patentable technology was epitomized as something that “had substance, and moving parts, and did something out in the practical world of farming or manufacturing”).

⁶⁴ Robert P. Merges, *As Many as Six Impossible Patent before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 579 (1999) (explaining how after business methods and software became patent eligible subject matter, “[f]or better or for worse, whole new landscapes have been opened to the possibility of patents”); <https://scholarship.law.ufl.edu/cgi/viewcontent.cgi?article=1152&context=jtlp>; Nancy Gallini, *The Economics of Patents: Lessons from Recent U.S. Patent Reform*, 16 Journal of Economic Perspectives 131, 133-34 (2002).

⁶⁵ Oversight of the United States Patent and Trademark Office, House Committee on the Judiciary, (May 22, 2018), <https://www.youtube.com/watch?v=rP4OZM5o48g> (former USPTO director Iancu explaining how over past couple of decades there has been “an explosion of prior art publications and how despite general public’s increased access to said publications, examiners are limited to finding no more than a few “key references” and therefore the job becomes “increasingly more difficult” based on the “sheer numbers” alone.)

⁶⁶ Oversight of the U.S. Patent and Trademark Office, House Committee on the Judiciary, (Apr. 27, 2023), <https://www.youtube.com/watch?v=Zu0x6GGRqbM>.

⁶⁷ Douglas G. Lightman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45, 51 (2007) (explaining how rising volume of patent applications has overwhelmed patent examiners); <https://www.peertopatent.org/wp-content/uploads/sites/2/2013/11/First-Pilot-Final-Results.pdf> (“Patent examiners...are struggling under a massive backlog of more than one million applications.”); Michael J. Meurer, *Patent Examination Priorities*, 51 WM. & MARY L. REV. 675, 677 (2009); Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 979 (2019) (explaining how reports commissioned by federal government reveal examiners view themselves as “‘fighting for their lives.’”).

⁶⁸ Christopher A. Cotropia & Mark Lemley, *Do applicant patent citations matter?* 42 Research Policy 844, 851 (2013) (“Evaluation of patents against prior art is crucial for ensuring that issued patents are not overly broad, and that claims are legitimately novel and non-obvious”); USPTO, Remarks by Director Iancu at the Prior Art Archive Launch Event, Oct. 3, 2018, <https://www.uspto.gov/about-us/remarks-director-iancu-prior-art-archive-launch-event> (“We all want high quality patents, and I think one of the most important touchpoints of quality is whether an issued patent withstands a fair challenge down the road. Surfacing the most relevant prior art during examination—and examining in light of that prior art—is critical to ensuring this level of quality for the patents that survive the initial examination.”)

⁶⁹ Intellectual Property: Patent Office Has Opportunities to Further Improve Application Review and Patent Quality [Reissued on September 21, 2016], GAO-16-883T, <https://www.gao.gov/products/gao-16-883t>.

Since the examination system was re-established in 1836, examiners have witnessed little change to the amount of time they are afforded to examine a single application.⁷⁰ It is uncontroversial that the overworked nature of examiners has contributed to poorer patent quality. It is also uncontroversial that examiner's search tools and processes are outdated.⁷¹ Unless search technology can keep up with the growing catalogue of prior art—and at the USPTO, it has not⁷²—expecting examiners to locate all, or even the majority of, relevant prior art will only become less and less realistic.

Here, we build on what some literature has mentioned in passing,⁷³ but that no publication has focused on exclusively: outsourcing the USPTO's prior art search to private firms.⁷⁴ Patent examiners are overwhelmed. There is no question that there is more than enough work to go around. Even critics of outsourcing admit that the government could not function without contracting out certain responsibilities.⁷⁵ We argue the prior art search is one of these responsibilities. Outsourcing the prior art search to private search firms will provide examiners with a better opportunity to evaluate the patent against a more robust prior art catalogue—a catalogue that was curated by a person, or a team of people, whose highest priority is to locate and assess prior art. We rely on empirical data showing that the Japanese Patent Office (JPO) has improved operational efficiency by outsourcing the prior art search.⁷⁶

The core argument for greater use of outsourcing is the efficiency gained by taking advantage of: (1) specialization coupled with the division of labor, and (2) the enhanced incentives within the private sector to adopt new technologies that improve efficiency. Specifically, where there are functionally separable tasks, efficiency can often be improved by

⁷⁰ Thom Tillis U.S. Senator for North Carolina, *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, <https://www.tillis.senate.gov/2022/8/tillis-and-leahy-introduce-bipartisan-legislation-to-improve-patent-quality> (“For decades there has not been a major change to the time afforded to patent examiners for the examination of patent application, yet the nature of the technology from which these patent applications are derived and the complexity of this technology have only increased. In addition, the proliferation of prior art, which patent examiners must search for and review in order to make patentability determinations, has only increased and it has done so at a rapid pace.”); USPTO, “Remarks by Director Iancu at the Prior Art Archive Launch Event,” <https://www.uspto.gov/about-us/remarks-director-iancu-prior-art-archive-launch-event> (Oct. 3, 2018) (PTO director stating, “However, uncovering the most relevant prior art during examination has become an increasingly more difficult task; especially with non-patent literature. This is because over the past couple of decades we have been experiencing both a publication explosion and an accessibility explosion. The result is that the amount of published literature has been increasing exponentially. Yet, for any one patent application, there is generally still one examiner with a certain—necessarily limited—number of hours available for examining that application.”)

⁷¹ Oversight of the U.S. Patent and Trademark Office, <https://www.youtube.com/watch?v=Zu0x6GGRqbM> (Apr. 27 2023), 1:17:00.

⁷² Oversight of the U.S. Patent and Trademark Office, House Committee on the Judiciary, <https://www.youtube.com/watch?v=Zu0x6GGRqbM> (Apr. 27, 2023) (current USPTO director describing current USPTO search technology as “very outdated.”)

⁷³ Michael Abramowicz & John Duffy, *Ending the Patenting Monopoly*, 157 U. Pa. L. Rev 1541, 1543 (2009) (arguing that USPTO monopolization of patent examination has “almost certainly negatively affected the U.S. patent system, contributing to decreased productivity, low-quality output, and reduced incentives to adopt innovation for examination of patent applications).

⁷⁴ Robert P. Merges, *As Many as Six Impossible Patent before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 601 (1999) (“What is an outside party has better information about patentability characteristics of the invention? Under these circumstances, it would be wise to permit the PTO to subcontract patent search and examination procedures to outside firms that have better information, better search technologies, or that simply work more efficiently. These firms would be in effect, “private patent offices.” This would yield a better decision regarding the optimal expenditure on search and examination for each application.”)

⁷⁵ Paul R. Verkuil, *Public Law Limitations on Privatization of Government Functions*, 84 N.C. L. REV. 397, 401 (2006) (admitting that “the reality is that our government could not function without contracting out some of its services”).

⁷⁶ Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601 (2015).

separating the tasks and assigning them to different specialists. This point was established long ago in Adam Smith's discussion of the process of pin making.⁷⁷ Greater use of the private sector would be helpful because incentives within the private sector tend to be directed toward greater efficiency. Incentives within the government, by contrast, are often directed toward inefficient ends. By the term efficiency, we refer here simply to the ratio of output to cost. Put simply, outsourcing can result in more high-quality patents produced by the USPTO at a lower cost.

We will begin by reviewing the existing literature on prior art search reform. Next, we will articulate the roadblocks examiners often face while searching for prior art. Finally, we will explain our proposal to outsource the prior art search to private firms.

Related Literature

There is no shortage of proposals to amend how the USPTO should improve patent examination. In 2007 the agency attempted to shift the duty of the prior art search from examiners to patent applicants by issuing a new rule requiring applications with more than five independent claims to include an examination support document ("ESD") with a detailed prior art search statement written by the inventor.⁷⁸ This proved unsuccessful, as prior to enforcement, the United States District Court for the Eastern District of Virginia permanently blocked the USPTO from implementing the rule.⁷⁹ Given the incentives to view their own applications with favorable bias, a matter we discussed in the previous Part, the attempt to shift the duty of search to patent applicants was bound to be unsuccessful. As this section will detail, while plenty of external critics have proposed alternative solutions focusing on the prior art search, these proposals have been largely unsuccessful.

Most scholars agree that examiners are not given adequate resources to perform their job well.⁸⁰ But the first major divide in the literature concerns whether the USPTO should invest more in up-front aspects of patent examination during initial prosecution, or whether the agency should focus more on the post-grant process. Numerous scholars have proposed the USPTO hire more examiners or increase the amount of time examiners are given to review each application to improve patent quality.⁸¹ Mark Lemley on the other hand, in a much-cited article titled, *Rational Ignorance*, argues that investing more resources in examination is inefficient.⁸² According to Lemley, since very few patents are economically significant and therefore never asserted against a competitor, investing in resources to support more intensive validity determinations after

⁷⁷ See Jean-Louis Peaucelle, Adam Smith's use of multiple references for his pin making example, 16 THE EUROPEAN JOURNAL OF THE HISTORY OF ECONOMIC THOUGHT 489 (2006).

⁷⁸ Vidya Atal & Talia Bar, Prior Art: To Search or Not to Search 28 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 507, 507-508 (2010).

⁷⁹ See *id.* at 508.

⁸⁰ Roger Allan Ford, *Patent Invalidity Versus Noninfringement*, 99 CORNELL L. REV. 71, 87-88 (2013); Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 EMORY L.J. 101, 101 (2008) ("A growing chorus of voices is sounding a common refrain: the U.S. Patent and Trademark Office (PTO) is issuing far too many bad patents.").

⁸¹ E.g., Beth Simone Noveck, *Peer to Patent: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J.L. & TECH. 123, 123 (2006).

⁸² Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1496 (2001) (concluding that costs of doubling amount of time examiners are given to review applications outweighed benefits resulting from decreasing number of bad patents issued by USPTO).

issuance (or simply allowing courts to deal with it) makes more sense.⁸³ However, many experts, including Ghosh & Kesan (2004), and more recently, Frakes & Wasserman (2019), have rejected Lemley's conclusions, arguing that assumptions he made given the lack of data at the time, were false.⁸⁴ Frakes & Wasserman (2019) revisited Lemley's "rational ignorance" argument with their own cost-benefit analysis asking whether we should increase USPTO examination resources to increase patent quality, or whether we should forgo these marginal investments and rely more heavily on courts.⁸⁵ The authors conclude the opposite of Lemley, finding that "the savings in future litigation and prosecution expenses associated with giving examiners additional time per application more than outweigh the costs of increasing examiner time allocations."⁸⁶ We too reject the 'rational ignorance' thesis, but we do not argue that simply giving examiners more time is the optimal solution.

Much of the scholarship concerning patent reform agrees that insufficient access to prior art is at the heart of patent quality issues. Crowdsourcing the prior art search, and variations of such proposals emerged in the mid-2000s.⁸⁷ Most notably, Noveck (2006) proposed the USPTO institute a crowdsourcing program known as 'open patent examination' or 'Peer-to-Patent'.⁸⁸ The USPTO conducted two pilots of this initiative—one from July 2007 to June 2009, and another from October 2010 to September 2011. The pilots targeted business method and software patents and sought to improve the non-patent prior art available to examiners by "enlisting volunteers to search for and share relevant 'prior art' with examiners."⁸⁹ Volunteers were also permitted to annotate and rate other volunteers' submissions.⁹⁰ With this information in hand, the examiner then determined patentability.⁹¹ While the idea garnered widespread support, the results of the pilots were underwhelming.⁹² Studies show that the program did not significantly affect allowance rates, led to a higher volume of continued examination requests, and increased the examiner's search efforts measured by the number of search reports they filed and references

⁸³ Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1496-97 (2001); Lemley et. al., *What to Do about Bad Patents*, REGULATION 10, 12 (2005) (explaining how most patents will "never be licensed, never be asserted in negotiation or litigation, and thus spending additional resources to examine them would yield few benefits.")

⁸⁴ See Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 988 (2019); Shubha Ghosh & Jay Kesan, *What Do Patents Purchase - In Search of Optimal Ignorance in the Patent Office*, 40 HOUS. L. REV. 1219 (2004); Arti K. Rai, *Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform*, 103 COLUM. L. REV. 1035, 1081 (2003)

⁸⁵ Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 980 (2019).

⁸⁶ Michael J. Meurer, *Patent Examination Priorities*, 51 WM. & MARY L. REV. 675, 677 (2009); Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 976, 981 (2019).

⁸⁷ See e.g., Beth Simone Noveck, *Peer to Patent: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J.L. & TECH. 123 (2006); Alisa K. Kao, *Peer Review of Patents: Can the Public Make the Patent System Better?*, 2007 U. ILL. J.L. TECH. & POL'y 395 (2007); Daniel R. Bestor & Eric Hamp, *Peer to Patent: A Cure for Our Ailing Patent Examination System*, 9 NW. J. TECH. & INTELL. PROP. 16 (2010); Roya Ghafaele & Benjamin Gilbert, *Crowdsourcing patent application review: leveraging new opportunities to capitalize on innovation?* 3 Intellectual Property Quarterly 23 (2011); Susan Walmsley Graf, *Improving Patent Quality through Identification of Relevant Prior Art: Approaches to Increase Information Flow to the Patent Office*, 11 LEWIS & CLARK L. REV. 495 (2007).

⁸⁸ Beth Simone Noveck, *Peer to Patent: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J.L. & TECH. 123 (2006).

⁸⁹ Michael J. Meurer, *Patent Examination Priorities*, 51 WM. & MARY L. REV. 675, 677 (2009); <https://obamawhitehouse.archives.gov/open/innovations/Peer-to-Patent>;

⁹⁰ The Ctr. for Patent Innovations at N.Y. L. Sch., *Peer to Patent First Pilot Final Results*, 10 (June 2012), <http://www.peertopatent.org/wp-content/uploads/sites/2/2013/1/1/First-Pilot-Final-Results.pdf>.

⁹¹ Beth Simone Noveck, *Peer to Patent: Collective Intelligence, Open Review, and Patent Reform*, 20 HARV. J.L. & TECH. 123 (2006).

⁹² Lisa Larrimore Ouellette, Pierson, *Peer Review, and Patent Law*, 69 VAND. L. REV. 1825 (2016).

they added after the first office action.⁹³ Furthermore, while the ceiling for the number of participating applications was 400, the first pilot attracted only 226 applications.⁹⁴ Additionally, volunteers only contributed an average of 2.66 prior art references per application.⁹⁵ In addition to the low opt-in rate, another apparent weakness of Peer-to-Patent and other potential crowdsourcing programs is that it is relying on volunteers—people who are not being paid anything or can provide any consideration to be held accountable. The USPTO and its issued patents, which shape industries by granting twenty-year monopolies, should not be reliant on volunteers. As the largest economy in the world,⁹⁶ the U.S. certainly must have a better solution than calling on volunteers to address shortcomings in this critical economic activity.⁹⁷

More recently, in 2018, in collaboration with the USPTO, a conglomerate of entities including MIT, Google, Cisco launched the “prior art archive” to improve the prior art search. Born out of concern that too much non-patent literature was being overlooked during examiners’ prior art searching, and a belief that patent applications should be rejected based on industry documentation and other non-patent literature, the archive aimed to provide a platform for private firms to contribute to the repository. Proponents argued firms would be motivated to contribute to the archive out of their own self-interest. They theorized that putting their prior art in front of examiners would reduce the risk of examiners overlooking it and improperly granting a bad patent. When launched, the archive initially included documents from Cisco and AT&T and other entities including Microsoft, Intel, Salesforce, Dell, Facebook, and Amazon were being onboarded. PTO examiners, along with lawyers and inventors, can access the archive within the Scientific and Technical Information Center (STIC). The archive included a customized parser algorithm allowing examiners to use the system without additional training—examiners can use their routine search strings and operators to explore the archive. Additionally, backend API support and open standard allowed the PTO or another entity to develop new search tools and apply AI, machine learning, and deep learning technologies to re-use content to improve the prior art search process. While the archive’s forward-thinking approach to how the database could evolve and eventually work with AI is laudable, this solution suffers from the same issue as the Peer-to-Patent program—it relies on individuals, but more specifically entities, to voluntarily assist the USPTO in doing its job. The archive has not garnered attention since its launch and, based on publicly available information, it was unsuccessful.

Lisa Ouellette, observing that “patenting practices seem divorced from the standards for judging technical contributions in many fields, with patents looking more like research proposals than completed scientific papers,” contends that past peer-review proposals do not permit experts

⁹³ Jin-Hyuk Kim & Benjamin Mitra-Kahn, *The unintended consequences of crowdsourcing prior art search*, 52 Applied Economics 2569 (2020).

⁹⁴ Lisa Larrimore Ouellette, Pierson, Peer Review, and Patent Law, 69 VAND. L. REV. 1825 (2016); Naomi Allen et al., The Ctr. for Patent Innovations at N.Y. L. Sch., Peer to Patent First Pilot Final Results, 10 (June 2012), <http://www.peertopatent.org/wp-content/uploads/sites/2/2013/11/First-Pilot-Final-Results.pdf>.

⁹⁵ Lisa Larrimore Ouellette, Pierson, Peer Review, and Patent Law, 69 VAND. L. REV. 1825 (2016); Naomi Allen et al., Peer to Patent: First Pilot Final Results (2012), <https://www.peertopatent.org/wp-content/uploads/sites/2/2013/11/First-Pilot-Final-Results.pdf>.

⁹⁶ <https://www.forbesindia.com/article/explainers/top-10-largest-economies-in-the-world/86159/1>

⁹⁷ Marla Page Grossman, Short Term Pain for Long Term Gain: Why Congress Should Stop Diverting U.S. Patent and Trademark Office User Fees, June 2011, 1 https://www.acslaw.org/wp-content/uploads/2018/04/Grossman_PTO_Fees_0.pdf (describing patents as “absolutely crucial to fostering invention, innovation, and investments, all of which are essential to the core strength of our nation’s competitiveness in the global economy.”)

to discuss enablement issues.⁹⁸ Recognizing that “patent examiners are ill-equipped to determine when an application really is just a research plan for which ‘undue experimentation’ is still required,” Ouellette argues that experts—which she describes as “persons of extraordinary skill”—should be brought into the examination process because “while patents are supposed to enable researchers of ordinary skill in the art to recreate the invention without undue experimentation, it typically takes extraordinary skill in the art to spot enablement problems based merely on reading a patent document.”⁹⁹ Ouellette’s enablement-focused critique of the examination system can work in harmony with our proposal, but we suggest that experts hired to assess patentability focus specifically on just that—patentability. In other words, experts should not take into their own hands the task of locating prior art. As we will discuss in Part IV, our proposal concerning fees and taxes will help the USPTO both pay for these experts, as well as hire more qualified examiners.

Examination Process Overview

The patent examination process is lengthy and complex. The USPTO has eight Technology Centers (TCs) comprised of art units who specialize in various technologies.¹⁰⁰ After the USPTO receives a patent application, the first step is for a Supervisory Patent Examiner (SPE) to classify the application under a specific art unit. Each art unit consists of 8-15 examiners.¹⁰¹ Once an application reaches its designated art unit, an SPE within the art unit then assigns the application to an examiner for review.¹⁰² SPEs are given significant discretion in how they assign applications—some SPEs assign applications randomly, whereas others push for technological specialization for the examiners in their unit.¹⁰³

On average, patent examiners spend just eighteen hours over a three-year period examining a patent application.¹⁰⁴ Several intensive tasks are packed into this short timeframe. First, the examiner will review the application, which typically encompasses closely reading the specification and claims. At this stage, the examiner may find that the application does not meet the requirements for patentable subject matter or utility. If that is the case, the examiner may draft an office action, which here would explain the grounds for rejection and objection made by the examiner, requiring a response from the applicant for prosecution to proceed. Additionally, the examiner must decide whether the claims are properly enabled, and whether they satisfy the written description and definiteness requirements. Importantly, since all patents are presumed valid, the examiner bears the burden to find a reason *not* to issue the patent. Thus, as this section articulates later, this likely contributes to why examiners are more inclined to grant patents than deny them, especially when they are short on time.¹⁰⁵

⁹⁸ Lisa Larrimore Ouellette, Pierson, Peer Review, and Patent Law, 69 VAND. L. REV. 1825, 1828 (2016).

⁹⁹ Lisa Larrimore Ouellette, Pierson, Peer Review, and Patent Law, 69 VAND. L. REV. 1825, 1827, 1836 (2016).

¹⁰⁰ Cesare Righi & Timothy Simcoe, *Patent examiner specialization*, Research Policy 137, 138 (2019).

¹⁰¹ Mark Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 Rev. Econ. Stat. 817, 818 (2012); Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1, 2 (2020).

¹⁰² S. Sean Tu & Mark A. Lemley, *What Litigators Can Teach the Patent Office about Pharmaceutical Patents*, 99 Wash. U. L. REV. 1673, 1678 (2022).

¹⁰³ Cesare Righi & Timothy Simcoe, *Patent examiner specialization*, Research Policy 137, 138 (2019).

¹⁰⁴ Lemley et. al., *What to Do about Bad Patents*

¹⁰⁵ Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 982 (2019).

Until this point, the examiner's review is typically confined within the four corners of the document. This changes when the examiner begins the more substantive phase of examination, starting with the prior art search. The goal of the prior art search is to identify "all relevant technological information publicly known at the time of filing of the patent application or when applicable, at the time of the priority filing" to determine whether the invention is both novel and non-obvious.¹⁰⁶ During the search, the examiner will consult databases of U.S. patents and patent applications, foreign patents, and more importantly for some industries such as software and business methods, nonpatent literature. The steps involved in the prior art search can be summarized as followed:

- Examining the *claims* and identifying terms/possible keywords,
- Distilling what the defining part of the invention is and forming a *search statement*,
- Identifying the most relevant *classifications* based on keywords and examiner's background knowledge,
- *Optional background search* to identify the most suitable terms and synonyms,
- Forming *search queries* using keywords, classification codes and Boolean functions,
- Finding the patents that are *likeliest* to be relevant to the application,
- *Sifting through* the retrieved documents, using color coded high-lights, drawers and sticky notes, to identify the most relevant patents,
- Further *narrowing down* the search results, often using figures and manual disambiguation of concepts, to identify close conceptual similarities,
- *Optional search* for published research/online materials.
- *Forming a conclusion* (judgement) about the novelty and inventiveness of the application.¹⁰⁷

The above list shows that the prior art search is complex. Privatizing the prior art search could serve the public interest by creating a more efficient patent system, through the use a specialized private workforce. Outsourcing the prior art search would allow examiners to focus on making patentability determinations by assessing the art more closely. Additionally, civil servants will oversee the imitative to ensure private search firms meet expectations. And because private firms will be motivated under the proposed system to produce high quality searches, examiners will be better poised to make such determinations than they often are currently. This will strengthen the presumption of validity. Challengers will face a more significant burden in proving patents invalid, and this should disincentivize bad-faith litigation.

Problems with the USPTO's Current Approach to Prior Art Searching

¹⁰⁶ Vikram Singh et. al., *Patent Database: Their Importance in Prior Art Documentation and Patent Search*, 21 Journal of Intellectual Property Rights 42, 42 (2016); ¹⁰⁶ https://talía-baruconn.edu/wp-content/uploads/sites/1683/2016/03/Bar2010_IJO.pdf; Kanishka Vaish et. al., *Artificial Intelligence Reducing the Intricacies of Patent Prior Art Search*, 2023 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), https://www.researchgate.net/profile/Kapil-Joshi-5/publication/372568925_Artificial_Intelligence_Reducing_the_Intricacies_of_Patent_Prior_Art_Search/links/64beb732b9ed6874a5421919/Artificial-Intelligence-Reducing-the-Intricacies-of-Patent-Prior-Art-Search.pdf, 978 ("A prior art search is conducted to know whether there is any existing invention already published in any specific domain and the novelty of the proposed invention or to be patented"; "the objective of [the prior art search] is to test the novelty, industrial application, utility, inventive step, and legal use of any invention.")

¹⁰⁷ Rossitza Setchi, *Artificial intelligence for patent prior art searching*, 64 World Patent Information 1,1 (2021).

Based on the number of patents invalidated at the PTAB by newly surfaced prior art (but that was, to be clear, published before the application date)¹⁰⁸ it is indisputable that the PTAB, which involves a more time-intensive prior art review by the petitioner, is often working with a more robust catalogue of relevant prior art than the examiner is during initial prosecution. This is likely because parties involved in PTAB litigation have conducted a much more thorough prior art search, either in-house or by hiring a private search firm.

a. Examiners are Equipped with Outdated Technology

For the most part, plans to improve prior art search technology within the USPTO have not come to fruition. When a former USPTO examiner was asked during a House Committee on the Judiciary, what congress can do to improve the USPTO's worldwide Chamber of Commerce Ranking, he responded by explaining how extremely dated the agency's prior art search technology is, and articulating how improvements to technology infrastructure and accessibility to prior art should be the number one priority.¹⁰⁹ That was in 2017. In 2018, when in a House Committee meeting addressing oversights at the UPTO, Congressman Tom Marino asked then USPTO director Andrei Iancu whether the USPTO has the best technology available. Iancu explained they are *working* on improving technology for the initial prior art search because it is "critically important" to patent quality and the "predictability" of patents.¹¹⁰ In this same year, Iancu lectured that "[a]mong other things we need tools to collect the relevant art in concentrated locations in order to reduce the time and resources needed to hunt it down, and tools to search that art efficiently and effectively."¹¹¹ In 2023—five years later—we know they are still only working on addressing this 'priority', as incumbent USPTO director Kathi Vidal told Congress essentially the same statement: the USPTO "critically needs to move to more innovative systems" as its "technology is very outdated."¹¹² This helps explain why today, it is still the case that in virtually every case brought before the PTAB, prior art is presented that was not considered by the examiner who initially prosecuted the patent—the technology and processes to identify all of the relevant art simply is not there internally at the agency.¹¹³

This section details how examiners are undercut by a lack of resources throughout the process and how this contributes to the issuance of questionable patents.¹¹⁴ Director Vidal has claimed the agency is "looking at" incorporating AI into the prior art search as a tool to help issue stronger patents. Given how immensely AI has developed in recent years, we find it underwhelming that the USPTO is still at the "looking into" stage of AI even five years after

¹⁰⁸ Citation needed

¹⁰⁹ The Impact of Bad Patents on American Businesses, House Committee on the Judiciary, Nadler, <https://www.youtube.com/watch?v=VaJpVmsLO6U>

¹¹⁰ Oversight of the United States Patent and Trademark Office, House Committee on the Judiciary, (May 22, 2018), <https://www.youtube.com/watch?v=rP4OZM5o48g>, 1:12:00.

¹¹¹ <https://techcrunch.com/2018/10/03/mit-google-cisco-and-uspto-create-prior-art-archive-for-better-patents/>, 0:37:00.

¹¹² Oversight of the U.S. Patent and Trademark Office, <https://www.youtube.com/watch?v=Zu0x6GGRqbM> (Apr. 27 2023), 1:17:00.

¹¹³ The Patent Trial and Appeal Board After 10 Years: Impact on Innovation and Small Business, House Committee on the Judiciary, June 23, 2022, https://www.youtube.com/watch?v=JHVR_8dAgnE.

¹¹⁴ The Impact of Bad Patents on American Businesses, House Committee on the Judiciary, Nadler, <https://www.youtube.com/watch?v=VaJpVmsLO6U> (explaining how under "difficult circumstances" the USPTO does the best job it can, but that "poor patents sometimes slip through the cracks" in part due to "pressure to quickly reduce the backlog of applications without having sufficient resources to properly evaluate each claim").

former director Iancu also told congress the USPTO was doing just the same.¹¹⁵ The agency's most recent Strategic Plan mentions incorporating AI into the examination process as a goal.¹¹⁶ But the USPTO has arrived at this goal too late. Private search firms have been incorporating AI into their search processes for years. Today, as a quick google search will show, there is a robust network of search firms to choose from.

Giving examiners "flawed and obsolete tools" for conducting prior art searches especially effects their ability to identify non-patent prior art.¹¹⁷ Non-patent prior art includes materials such as journal and magazine articles, books, manuals, catalogues, websites, conference proceedings, and scientific papers. And for some industries such as business methods and software, non-patent prior art comprises a large portion of the relevant prior art. As Ho and Ouellette explain, "Innovation often occurs outside the patent system, so the ability to locate novel scientific findings that are disclosed in scientific journal articles and other non-patent publications is critical for making an accurate determination of novelty."¹¹⁸ Yet, for several reasons USPTO examiners often fail to locate relevant non-patent literature.¹¹⁹ This is likely because (1) it is particularly time consuming to find non-patent literature, and examiners are short on time, and (2) examiners are not given proper tools to find non-patent art.¹²⁰ This has been an issue since courts made it affirmatively clear technologies such as business methods and patents were patent eligible subject matter.¹²¹ And more than two decades later, this is still a

¹¹⁵ Oversight of the United States Patent and Trademark Office, House Committee on the Judiciary, May 22, 2018, <https://www.youtube.com/watch?v=rP4OZM5o48g>.

¹¹⁶ Oversight of the U.S. Patent and Trademark Office, House Committee on the Judiciary, <https://www.youtube.com/watch?v=Zu0x6GGRqbM> (Apr. 27, 2023).

¹¹⁷ A.B. Jaffe & J. Lerner, *HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT*, NJ: Princeton University Press (2004), 101; Naomi Allen et al., *Peer to Patent: First Pilot Final Results* (2012), <https://www.peertopatent.org/wp-content/uploads/sites/2/2013/11/First-Pilot-Final-Results.pdf> ("While patent examiners have access to some non-patent literature, they do not have the same degree of access to much of the non-patent prior art literature that exists, such as published articles, software code, and conference presentations.").

¹¹⁸ Daniel E. Ho & Lisa Larrimore Ouellette, *Improving Scientific Judgments in Law and Government: A Field Experiment of Patent Peer Review*, 17 J. EMPIRICAL LEGAL STUD. 190 (2020).

¹¹⁹ Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 Berkeley Technology Law Journal 763, 763 (2002) ("It is widely recognized that the Patent Office grants overly-broad patents because it has deficient knowledge of the relevant prior art, especially in high technology areas with significant nonpatent prior art."); Christopher Cotropia et. al, *Do applicant patent citations matter?*, 42 Research Policy 844, 844 (2013) ("Examiners are much more active in citing patented relative to nonpatented prior art, both absolutely and compared to applicants."); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305 (2001).

¹²⁰ Peter S. Menell, *A Method for Reforming the Patent System*, 13 Michigan Telecommunications and Technology Law Review 487, 504 (2007) (stating that "time and database constraints severely limit the ability of examiners to search non-patent prior art."); Intellectual Property: Patent Office Should Strengthen Search Capabilities and Better Monitor Examiners' Work, <https://www.gao.gov/products/gao-16-479> (June 30, 2016); <https://www.peertopatent.org/wp-content/uploads/sites/2/2013/11/First-Pilot-Final-Results.pdf>, 4 ("[p]atent examiners conduct their research in a limited database...while patent examiners have access to some non-patent literature, they do not have the same degree of access to much of the non-patent prior art literature that exists, such as published articles, software code, and conference presentations."); Andrew M. Riddles & Brenda Pomerance, *Software Patentee Must Conduct Own Search: Prior-Art Searches Made by the Patent Office Often Are Not Thorough Enough To Be Trusted*, Nat'l L.J., Jan. 26, 1998, at C19; A.B. Jaffe & J. Lerner, "How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It," NJ: Princeton University Press (2004), 103 ("The patent office has search tools that allow it to efficiently search U.S. patents for prior art. But when little of the knowledge is in the form of patents, the quality of the searches is likely to suffer.")

¹²¹ Robert P. Merges, *As Many as Six Impossible Patent before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 589 (1999) (reporting that in 1999, soon after business method patents emerged as patentable subject matter, it was disturbing that although patents had only recently become available to this technology, business method patent applications contained fewer than five prior art citations, and on average applications contained two non-patent citations and therefore it was likely that many business method patents issued overlooked highly relevant art).

problem, despite significant advances in technology and private search firms showing that these advances can be leveraged to improve prior art searching.¹²²

The fundamental reason for stagnancy within the USPTO with respect to the technology applied to prior art search is the existence of a traditional public-sector incentive structure. Within the private sector, a technology that could greatly improve the efficiency of some process would be evaluated on a benefit-cost basis, and adopted quickly if the benefit-cost ratio is sufficiently high. A firm that failed to do so would lose out to rivals who adopted the efficient process more quickly. In the USPTO process, however, there is no immediate or foreseeable profit lure to induce the agency to move quickly on adopting and integrating technological improvements.

b. Existing Examiner Incentives Do Not Encourage High-Quality Prior Art Searches

Institutional incentives should be examined as they can affect examination quality.¹²³ We observe that even if the USPTO could improve search technology internally, years of data have shown the agency's culture is not well-suited for encouraging high quality prior art searches. Prior literature has criticized the USPTO's 'performance-based' quota and bonus system for incentivizing examiners to grant weak patents.¹²⁴ Examiners are expected to meet quotas, which are determined by their position in the general schedule (GS) pay system and complexity of the art unit field.¹²⁵ Additionally, examiners can receive bonuses based on a count system.¹²⁶ An examiner receives "1.25 counts for a non-final rejection, 0.75 counts for an allowance or final rejection after the initial non-final rejection, 0.75 counts if the applicant abandons the application after the first action, or the full 2 counts for a first action allowance."¹²⁷ The bonus system does not provide counts for executing other tasks, such as conducting the prior art search, compelling additional amendments after the first office action, and issuing final rejections.¹²⁸

The USPTO count system is an outcome-driven system. It incentivizes examiners with bonuses based on how many applications they process.¹²⁹ It creates a bias toward granting

¹²² Kanishka Vaish et. al., *Artificial Intelligence Reducing the Intricacies of Patent Prior Art Search*, 2023 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), https://www.researchgate.net/profile/Kapil-Joshi-5/publication/372568925_Artificial_Intelligence_Reducing_the_Intricacies_of_Patent_Prior_Art_Search/links/64beb732b9ed6874a5421919/Artificial-Intelligence-Reducing-the-Intricacies-of-Patent-Prior-Art-Search.pdf.

¹²³ Yee Kyoung Kim & Jun Byoung Oh, *Examination workloads, grant decision bias and examination quality of patent office*, 46 Research Policy 1005, 1006 (2017).

¹²⁴ Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1496 footnote 3 (2001) ("[T]here are strong structural and psychological pressures on examiners to issue patents rather than reject applications, no matter how weak the alleged invention seems.")

¹²⁵ Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1, 3 (2020).

¹²⁶ Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1, 3 (2020).

¹²⁷ Charles A.W. DeGrazia et. al., *Examination incentives, learning, and patent office outcomes: The use of examiner's amendments at the USPTO*, 50 Research Policy 1, 2 (2021) (citing Marco, A.C., Toole, A.A., Miller, R., Frumkin, J., 2017. USPTO Prosecution and Examiner Performance Appraisal).

¹²⁸ Mark Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 Rev. Econ. Stat. 817, 818 (2012).

¹²⁹ A.B. Jaffe & J. Lerner, "How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It," NJ: Princeton University Press (2004).

patents, and doing so quickly along the prosecution timeline. It takes less time to grant patents than to deny patents because rejecting an application requires the examiner to find evidence that the claimed invention is not novel or is obvious to a person skilled in the art.¹³⁰ This is in-part because patents are presumed valid, so while examiners are not required to include a written justification for why an application is accepted, they are required to explain why they have denied an application. Making this determination is complicated—prior art is expansive and most of the time, the examiner is not a person skilled in the art of the invention. Although after the AIA created PTAB, examiners now have the power to finally reject applications, applicants can still go back and forth with the examiner an unlimited number of times until the examiner has grounds to finally reject the application (as opposed to non-finally rejecting the application).¹³¹ Because examiners do not receive counts for additional amendments after the first office action, examiners might be more inclined to accept an application. As Jaffe and Lerner state clearly, “[The bonus] scheme creates an obvious incentive for examiners to ‘go easy’ on applicants and allow their patents to be granted.”¹³²

With an incentive scheme that tends to reward the granting of patents by examiners, one should not be surprised to discover that the process generates some questionable or low-quality patents. Of course, no process for awarding patents is perfect, even if perfection could be defined in the first place. The problem at bottom is one of choosing the optimal balance in “false acquittals” and “false convictions”. In the patent award system, a false acquittal is an erroneous grant of a patent, and it has an attendant “false acquittal cost”. The false acquittal cost would consist of the litigation and crowding-out effects of bad patents. On the other hand, a false conviction is an erroneous rejection of a patent application. The false conviction has an attendant false conviction cost, consisting of the failure to appropriately reward innovation to the degree appropriate to create optimal innovation incentives. The USPTO’s process should be understood, therefore, as an award system that assumes that the false conviction cost is greater than the false acquittal cost generally. Whether this is true is an empirical question. The same incentive structure applies to the time management of examiners.

c. Time, Time Management, and Overseeing Examiners Falls Short

The time examiners are afforded is another roadblock to issuing strong patents. On average, examiners spend eighteen hours reviewing a single application.¹³³ An estimated 70% of

¹³⁰ Schuett, Patent Quality and Incentives at the Patent Office, 44 RAND J. OF ECON. 313, 328-29 (2013); A.B. Jaffe & J. Lerner, “How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It,” NJ: Princeton University Press (2004).

¹³¹ Mark A. Lemley, *Can the Patent Office Be Fixed?*, 15 INTELLECTUAL PROPERTY L. REV. 295, 296 (2011) (citing Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U.L. REV. 63 (2004) (Before the AIA, “Patent examiners [could] never finally reject a patent application; applicants dissatisfied with the outcome [could] come back an unlimited number of times to try again through various mechanisms.”); Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1,2 (2020) (explaining that when an examiner receives the applicant’s respond to an office action, they can: “(1) allow the patent to issue, (2) finally reject the application, or (3) non-finally reject the application.”) The AIA improved this process for examiners by allowing them to issue final rejections, forcing dissatisfied applicants to either file a repeat application or abandon the application and appeal to the PTAB.

¹³² A.B. Jaffe & J. Lerner, “How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It,” NJ: Princeton University Press (2004), 98.

¹³³ Michael J. Meurer, Patent Examination Priorities, 51 WM. & MARY L. REV. 675, 677 (2009); Michael D. Frakes & Melissa F. Wasserman, *Irrational Ignorance at the Patent Office*, 72 VAND. L. REV. 975, 982 (2019) (“[A] patent examiner that is not able to conduct a sufficient search of prior art and articulate a proper basis of rejection during their allotted review time is legally

examiners are given insufficient time to thoroughly review the applications before them.¹³⁴ Additionally, Jaffe and Lerner have highlighted anecdotal evidence from examiners claiming they have been criticized by supervisors for engaging in too much review of patents prior to issue and have been pushed to increase their first-action allowance rates.¹³⁵ Studies by Frakes & Wasserman and others have shown that when examiners are given less time to review an application, they are less active in searching for prior art and are more likely to grant patents, regardless of whether the application has merit.¹³⁶ As these authors explain, the time constraints examiners face contributes to the USPTO's patent quality problem by discouraging a thorough prior art search and ultimately granting the patent even when more time is needed to make a comprehensive patentability assessment.¹³⁷ A study at the National Bureau of Economic Research has reinforced this finding.¹³⁸

The agency has struggled to monitor examiner's time *management* skills. Examiners have been subject to investigation by the Government Accountability Office (GAO) for procrastination, evidenced by a high rate of end-loading application decisions until the end of their quota period.¹³⁹ The GAO has concluded that the "USPTO has not comprehensively assessed the time examiners need to perform high quality patent examinations, including prior art searches."¹⁴⁰ Several issues emerge here that are likely related to why examiners often conduct lackluster prior art searches: examiners are not given enough time to review applications, examiners are not held accountable for managing the time they do have, and specific expectations are unclear.

Empirical research highlights an interesting trend in examiner behavior—the more senior the examiner, the more likely they are to grant a patent application, and the higher their first-action allowance rate is.¹⁴¹ Lemley and Sampat show that more tenured examiners spend less

expected to allow the application...examiners who do not have enough time to properly evaluate applications are likely to grant invalid patents.")

¹³⁴ Government Accountability Office (GAO), 2016, Intellectual Property: Patent Office Should Define Quality, Reassess Incentives, and Improve Clarity.

¹³⁵ A.B. Jaffe & J. Lerner, "How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It," NJ: Princeton University Press (2004), 98.

¹³⁶ Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 Rev. Econ. & Stat. 550, 550 (2017); see also Ashleigh Hebert, *Expediting Green Patents: The Expedited Examination Programs' Contribution to Diminished Patent Quality*, 31 CARDOZO Arts & ENT. L.J. 249, 251 (2012) ("[p]atent quality...is diminished when the system encourages examiners to spend less time on each application.")

¹³⁷ Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, 99 Rev. Econ. & Stat. 550, 550 (2017); see also Ashleigh Hebert, *Expediting Green Patents: The Expedited Examination Programs' Contribution to Diminished Patent Quality*, 31 CARDOZO Arts & ENT. L.J. 249, 251 (2012).

¹³⁸ Brian Fung, Inside the stressed-out, time-crunched patent examiner workforce, Washington Post (July, 31, 2014), <https://www.washingtonpost.com/news/the-switch/wp/2014/07/31/inside-the-stressed-out-time-crunched-patent-examiner-workforce/>.

¹³⁹ Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1, 11 (2020).

¹⁴⁰ Intellectual Property: Patent Office Has Opportunities to Further Improve Application Review and Patent Quality [Reissued on September 21, 2016], GAO-16-883T, <https://www.gao.gov/products/gao-16-883t>.

¹⁴¹ Mark Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 Rev. Econ. Stat. 817 (2012). A first action allowance is when the examiner grants the application after just the first round of review. When issuing the first-office action, the examiner can either allow the patent or not allow it and provide reasoning for why it did not meet patentability standards.

time searching for prior art.¹⁴² The most obvious explanation for this is examiners are given less time to review applications as they become more senior at the agency.¹⁴³ The USPTO expects examiners to be more efficient overtime. This makes it more likely that they will grant patents on applications that patent offices in other countries reject.¹⁴⁴

The USPTO's attempt to qualitatively monitor examiners is minimal. Alongside the quota system, examiners are subject to performance appraisal reviews by supervisors and to independent quality reviews by the Office of Patent Quality Assurance.¹⁴⁵ However, whereas the quota system is tracked every two weeks, quality-based reviews occur on a limited basis. A 2015 report for example, showed that only four applications per year are drawn for qualitative review.¹⁴⁶ Furthermore, the USPTO does not currently reprimand examiners who issue patents that courts later invalidate.¹⁴⁷ Making a case for punishing examiners for oversights in the patent art search, given the overburdened and arguable low-compensated nature of the job, is hard. However, it is reasonable to hold employees at private search firms more accountable. Their sole job function would be to conduct comprehensive prior art searches to decrease the likelihood that a patent will later be invalidated based on prior art that *could* have been found, but was *not* found, during the initial prior art search.

Prior literature offers a plethora of reasons for why examiners often do not conduct a thorough enough prior art search.¹⁴⁸ And, despite the USPTO launching its "Enhanced Patent Quality Initiative," the GAO found that the USPTO "still faces limitations in assessing patent quality overall," singling out issues with the "thoroughness of examiners' prior art search for different technologies."¹⁴⁹ Here, we see that even when the agency reflects on criticisms it has faced and makes a deliberate effort to improve upon them, it still fails to find solutions within itself.

In light of the foregoing, outsourcing the prior art search warrants consideration. USPTO's most recent strategic plan suggests the agency should task itself with developing and implementing new prior art search technology.¹⁵⁰ We disagree, as private firms will have

¹⁴² Mark Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 Rev. Econ. Stat. 817 (2012).

¹⁴³ *See id.*

¹⁴⁴ *See id.*; see also Charles A.W. DeGrazia et. al., *Examination incentives, learning, and patent office outcomes: The use of examiner's amendments at the USPTO*, 50 Research Policy 1, 2 (2021). We acknowledge empirical work offering a more optimistic perspective. DeGrazia (2021) argues that one possible reason that more senior examiners having higher first-action allowance rates is that as examiners become more senior, they more frequently leverage an examination tool called the 'examiner's amendment'. The examiner's amendment serves to expediate the examination process, allowing examiners to communicate and negotiate with applicants in real time.¹⁴⁴ DeGrazia (2021) shows that this is associated with a 56% decrease in post-action pendency, without degrading patent quality.

¹⁴⁵ Michael D. Frakes & Melissa F. Wasserman, *Procrastination at the Patent Office?*, 183 Journal of Public Economics 1, 3 (2020).

¹⁴⁶ *See id.* at 2 (citing OIG, 2015).

¹⁴⁷ Michael Abramowicz & John Duffy, *Ending the Patenting Monopoly*, 157 U. Pa. L. Rev 1541, 1544 (2009).

¹⁴⁸ Intellectual Property: Patent Office Has Opportunities to Further Improve Application Review and Patent Quality [Reissued on September 21, 2016], GAO-16-883T, <https://www.gao.gov/products/gao-16-883t> (noting that amount of time examiners are given to review each application may affect examiners' ability to ensure USPTO-issued patents are high quality").

¹⁴⁹ Intellectual Property: Patent Office Has Opportunities to Further Improve Application Review and Patent Quality [Reissued on September 21, 2016], GAO-16-883T, <https://www.gao.gov/products/gao-16-883t>.

¹⁵⁰ USPTO 2022-2026 Strategic Plan ("The USPTO will also provide new tools for patent examiners to use to search enormous and growing global databases of technical information--including publicly available sources maintained by the FDA--to determine whether similar innovations already exist")

incentives to search efficiently, including developing new technology for search.¹⁵¹ Private firms, which have a strong profit motive, tend to be more effective at measuring employee performance than public firms.¹⁵² Moreover, we live in an age where search technology is ripe for technological integration, especially Artificial Intelligence (AI) solutions. Experts have deemed many traditional search methods still used by the USPTO—including using “Boolean logic, keywords, synonym-selection, classifiers, multilingualism, and other techniques”—inefficient.¹⁵³ AI can improve prior art searching by “suggesting search keywords, retrieving relevant documents, ranking them, and visualizing their context.” In doing so, AI can “reduce the time and cost involved in sifting through many patents”¹⁵⁴ These improved strategies, which private firms are better suited for developing and implementing, will make oversights less likely.

2. The Solution: Outsource the Prior Art Search to Private Firms

There is no general doctrine mandating that government perform all traditional government functions. However, lines obviously must be drawn when constitutional or national security matters arise. We do not attempt to engage in an in-depth discussion regarding these lines. U.S. law permits outsourcing to private sector contractors when the work is not *inherently governmental* in nature. And thus, we proceed under what we contend is a reasonable assumption: that prior art searching in patent applications is not inherently governmental.¹⁵⁵

The concept of outsourcing USPTO activities is not new. Outsourcing the prior art search was considered in 2003, as part of the *21st Century Strategic Plan*.¹⁵⁶ The plan, released under former USPTO director James Rogan, included several proposals to combat increasing pendency times and poorer patent quality. A significant aspect of this plan was “competitive sourcing to the

¹⁵¹ Michael Abramowicz & John Duffy, *Ending the Patenting Monopoly*, 157 U. Pa. L. Rev 1541 (2009); <https://www.mckinsey.com/industries/public-sector/our-insights/how-to-create-win-win-public-outsourcing-contracts>; <https://www.jstor.org/stable/10.7249/j.ctt6wq8hc.13?Search=yes&resultItemClick=true&searchText=au%3A&searchText=%22Heather+Krull%22&searchUri=%2Fopen%2Fsearch%2F%3Fpage%3D1%26amp%3Bso%3Drel%26amp%3Btheme%3Dopen%26amp%3Bsi%3D1%26amp%3BQuery%3Dau%253A%2522Heather%2BKrull%2522&seq=2>

¹⁵² Michael Abramowicz & John Duffy, *Ending the Patenting Monopoly*, 157 U. Pa. L. Rev 1541 (2009); <https://www.mckinsey.com/industries/public-sector/our-insights/how-to-create-win-win-public-outsourcing-contracts>; <https://www.jstor.org/stable/10.7249/j.ctt6wq8hc.13?Search=yes&resultItemClick=true&searchText=au%3A&searchText=%22Heather+Krull%22&searchUri=%2Fopen%2Fsearch%2F%3Fpage%3D1%26amp%3Bso%3Drel%26amp%3Btheme%3Dopen%26amp%3Bsi%3D1%26amp%3BQuery%3Dau%253A%2522Heather%2BKrull%2522&seq=2>

¹⁵³ Kanishka Vaish et. al., *Artificial Intelligence Reducing the Intricacies of Patent Prior Art Search*, 2023 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), https://www.researchgate.net/profile/Kapil-Joshi-5/publication/372568925_Artificial_Intelligence_Reducing_the_Intricacies_of_Patent_Prior_Art_Search/links/64beb732b9ed6874a5421919/Artificial-Intelligence-Reducing-the-Intricacies-of-Patent-Prior-Art-Search.pdf.

¹⁵⁴ Kanishka Vaish et. al., *Artificial Intelligence Reducing the Intricacies of Patent Prior Art Search*, 2023 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), https://www.researchgate.net/profile/Kapil-Joshi-5/publication/372568925_Artificial_Intelligence_Reducing_the_Intricacies_of_Patent_Prior_Art_Search/links/64beb732b9ed6874a5421919/Artificial-Intelligence-Reducing-the-Intricacies-of-Patent-Prior-Art-Search.pdf (highlighting importance of human-in-the-loop methods and need for better tools that support human-centered decision-making in prior art searching)

¹⁵⁵ John A. Jeffery, *Preserving the Presumption of Patent Validity: An Alternative to Outsourcing the U.S. Patent Examiner's Prior Art Search*, 52 CATH. U. L. REV. 761 (2003). In response to the 21st century plan, this author asserts (1) that “the prior art search function [is] so closely intertwined with the examiner’s quasi-judicial patentability determination so as to preclude its separation from the patentability determination, and (2) that “the prior art search, like the ultimate patentability determination, [is] such an inherent government function as to prevent its outsourcing.” We disagree, although the prior art search is indeed an important function, search firms will not be permitted to assess patentability. That is strictly the role of the USPTO examiners.

¹⁵⁶ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 283 (2003).

private sector of prior art search functions for international and national patent applications.”¹⁵⁷ Proponents of this plan expected outsourcing to deliver substantial benefits to the USPTO and its stakeholders by allowing examiners to focus on patentability determinations as opposed to prior art searching.¹⁵⁸ Additionally, proponents expected the quality of the prior art search would improve since contracted firms would be in a better position to allocate more time and resources to identifying prior art.¹⁵⁹ We agree with these assumptions. But if a proposal to outsource already failed, why then, should we revisit an outsourcing proposal? The answer to this question is two-fold.

First, the 2003 proposal included that the prior art search be outsourced for all applications. We propose a more nuanced approach, where the USPTO outsources only prior searches for ‘simple’ as opposed to ‘complex’ applications. A main point of opposition to outsourcing was that the USPTO would lose the ‘synergy’ in an application examination process. Our proposal follows empirical work showing that there is a difference between ‘simple’ and ‘complex’ applications.’ Complex and simple applications are distinguishable in that complex applications involve a higher number of claims prior art references. This tends to increase the number of hours examiners must spend to adequately review the application.¹⁶⁰ Accordingly, we argue the prior art search should not necessarily be outsourced for complex applications as, indeed, there is no research to reject the argument that synergy does not matter. However, it should be outsourced for simple applications where synergy is not so great a concern.¹⁶¹ Second, in the past two decades, prior art has only become more expansive, and the technology only more capable of improving the process. Now, more than ever before, the market for developing AI to improve search technology is ripe for competition. Another key difference between our proposal and the 21st Century Plan is that the Plan proposed that the search be contracted to either commercial search entities *or* government search entities, and we propose that the USPTO partner only with private firms.¹⁶² Additionally, we are not suggesting that the USPTO outsource prior art searching to an international patent office, such as how countries including Turkey, Singapore, Iceland and the UK have outsourced prior art searching to the Danish Patent and Trademark Office. As we explain below, outsourcing to private firms is optimal as private firms are more incentivized to complete work efficiently and develop more innovative tools. They will need to do so to remain competitive against other firms vying for contracts.

Of course, not every private firm should be considered eligible to compete for the prior art search business. For example, private firms controlled by governments that are hostile to the interests of the U.S. should not be among eligible bidders. Such hostile actors might use access

¹⁵⁷ See *id.*; Andrew Chin, Search for Tomorrow: Some Side Effects of Patent Office Automation, 87 N.C. L. REV. 1617, 1624 (2009) (“The plan expressly allows for the performance of prior art search by various parties other than the patent examiner, including contractor search services, foreign patent offices, and patent search and examination agencies acting on applications filed under the Patent Cooperation Treaty (“PCT”).

¹⁵⁸ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 283-84 (2003)

¹⁵⁹ See *id.*

¹⁶⁰ See Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1602.

¹⁶¹ See *id.* at 1601.

¹⁶² Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 284 (2003) (“The contractor may be a commercial search entity or a government search entity with demonstrated expertise and search skills.”)

to the search process as means of monitoring technological innovation in the U.S., in order to scoop or to thwart domestic businesses.

The evidence suggests room for improvement through outsourcing. Research shows that the JPO's approach to the prior art search results in stronger patents than those issued by the USPTO.¹⁶³ The JPO has been outsourcing the prior art search for decades. It made a strategic decision to outsource prior art searches to reduce pendency times and maintain quality patent examination when faced with an increase in patent applications for years.¹⁶⁴ Investing in outsourcing allowed the JPO to leverage external knowledge and capabilities to improve examination quality and speed. As a result, examiners have processed more applications each month and the JPO has thus lowered pendency times.¹⁶⁵ Therefore, we argue the USPTO should outsource the prior art search similarly to how the JPO outsources the prior art search.

The JPO conducts two different types of prior art outsourcing: (1) *dialogue-type* outsourcing, which is “a way of outsourcing by which the patent examiner receives a report on the prior art search result from the searcher, not only in writing but together with an oral presentation by the searcher based on the report,” and is utilized to “raise the understanding of the examiner on the details of the invention and prior art documents,” and (2) *paper-type* outsourcing, which is “a way of outsourcing by which the results of prior art document searches are reported by only providing applicants paper-based search reports.”¹⁶⁶ In either case, the examiner still makes the patentability determination, and if necessary, the examiner sometimes supplements the search results with his or her own searching.¹⁶⁷ Thus, the prior art search conducted by the contractor should be viewed as a tool for the examiner—the search becomes a valuable asset that helps examiners determine patentability more efficiently and with more information than they likely would have had they conducted the search themselves.¹⁶⁸ This allows examiners to focus more on the substantive part of examination—determining whether the invention is in fact patentable.

Importantly, the JPO does not outsource the prior art search in every application. Rather, they outsource roughly 65% of all examined applications.¹⁶⁹ Examiners tend to outsource the prior art search for less complex inventions, and to conduct the search for more complex

¹⁶³ See Toshiko Takenaka, *The Role of the Japanese Patent System in Japanese Industry*, 13 UCLA PACIFIC BASIN LAW JOURNAL 25 (1994).

¹⁶⁴ See Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1601.

¹⁶⁵ See *id.* (reporting that “the average number of monthly examinations per examiner increased from 13.6 to 16.0 between 1999 and 2007 as the rate of outsourcing increased from 30% to 70%.”)

¹⁶⁶ IP5SR_2012, https://english.cnipa.gov.cn/module/download/download.jsp?i_ID=178462&colID=2967.

¹⁶⁷ Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1602.

¹⁶⁸ The rationale behind this is that the contracted party should perform more comprehensive searches as that is their specialty, as opposed to an examiner who is responsible for many other tasks besides the prior art search, and is working under strict time constraints. This is supported by the “search scope view,” which holds that “outsourcing of prior art search enhances the efficiency of the examination process since the examiner can take advantage of the search ability of the searchers specialized in prior art identification and thus he/she can expand the potential search scope.” Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1602.

¹⁶⁹ Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1601.

examinations themselves.¹⁷⁰ Examiners do not outsource the prior art search for complex applications when the examiner is socially driven or motivated by intrinsic rewards such as career implications.¹⁷¹ The *synergy view* holds that the “quality and the speed of examination become higher if the same examiner conducts both prior art search and substantive examination” and that such integration can “also save the time necessary for communication and coordination between two individuals, examiners, and searchers, if the two tasks were divided.” Empirical research shows that outsourcing has substantially helped the JPO improve pendency times and efficiency.¹⁷² Currently, the Scientific and Technical Information Center within the USPTO helps some examiners with prior art searching.¹⁷³ Additionally, within the Science and Technical Information Center there is an Electronic Information Center which employs “professional contracted searchers to assist examiners in locating prior art, mainly non-patent literature.”¹⁷⁴ Furthermore, the majority of gene sequence searches are performed by contractors who then deliver the results to examiners.¹⁷⁵ Thus, the notion that contracting with private firms to conduct prior art searches should be prohibited because it would interrupt the *synergy* in the examination process is overstated—examiners are already familiar with such a dynamic. The key difference is that examiners would be working with information located by an individual or team that is employed by a private firm, as opposed to another civil servant.

One might argue that examiners conducting the prior art search themselves aids in their understanding of the technology involved in the invention. As illustrated by the JPO’s model, this matters more in ‘complex’ as opposed to ‘simple’ applications. This is because substantive examination is more intensive, and communication and coordination with the application is likely more involved. Following this model should also help the USPTO mitigate one other potential cost of outsourcing—“forgetting”—which is the idea that if you stop performing a certain activity, you will lose the skill and the learning opportunity.¹⁷⁶ In this case, outsourcing some prior art searching to private firms will not result in examiners losing prior art search skills. They will still practice these skills, but their utilization of the skillset will be reserved for simple applications.

The key difference between how the JPO outsources its prior art searches and how we propose the USPTO outsources theirs is that the JPO contracts with what is essentially a quasi-governmental agency called the “Industrial Property Cooperation Center” (IPCC).¹⁷⁷ This relates to the fact that the JPO created the outsourcing agency out of necessity as it faces a budgetary

¹⁷⁰ Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1612.

¹⁷¹ *See id.*

¹⁷² For example, in 2012, increasing dialogue-type outsourcing accelerated examinations by 20.1 months on average. https://english.cnipa.gov.cn/module/download/down.jsp?i_ID=178462&colID=2967

¹⁷³ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 284 (2003).

¹⁷⁴ *See id.*

¹⁷⁵ *See id.*

¹⁷⁶ Markus Reitzig & Stefan Wagner, *The Hidden Costs of Outsourcing: Evidence From Patent Data*, 31 Strat. Mgmt. J. 1183 (2010). This study exclusively focuses on firms themselves outsourcing prior art searches for market research, not patent offices outsourcing.

¹⁷⁷ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 284 (2003).

ceiling on the number of civil servants they are permitted to employ.¹⁷⁸ In contrast, under our proposed system, private firms would be invited to compete for the opportunity to contract with the USPTO. An agency contracting officer would select private search firms bidding competitively for the contract. We envision outsourcing at the USPTO would operate similar to A-76 competitive sourcing, which permits executive agencies to identify commercial-type activities that are best provided by the private sector, and to then allow the private sector, government employees, and other agencies through a fee-for-service agreement to compete amongst each other for contracts. But unlike A-76 competitive outsourcing, our proposed system would not extend an invitation to the government (in this case, the USPTO) to compete for the contract. The USPTO should enable competition by inviting private firms to compete for the contract to drive down costs. However, one firm should not be given a monopoly on the service.

Overcoming Potential Setbacks

There are several potential setbacks that may need to be addressed for this proposal to be successful. The first concerns ensuring that the USPTO does not violate any laws by outsourcing to the private sector. Outsourcing is permissible so long as the activity is classified as a “commercial activity” under the A-76 guidelines. A commercial activity is defined as:

“[A] recurring service that could be performed by the private sector and is resourced, performed, and controlled by the agency through performance by government personnel, a contract, or a fee-for-service agreement. A commercial activity is not so intimately related to the public interest as to mandate performance by government personnel. Commercial activities may be found within, or throughout, organizations that perform inherently governmental activities or classified work.”¹⁷⁹

Furthermore, the activity must not be considered an “inherently governmental” activity. Such activities involve:

- (1) Binding the United States to take or not to take some action by contract, policy, regulation, authorization, order, or otherwise;
- (2) Determining, protecting, and advancing economic, political, territorial, property, or other interests by military or diplomatic action, civil or criminal judicial proceedings, contract management, or otherwise;
- (3) Significantly affecting the life, liberty, or property of private persons; or
- (4) Exerting ultimate control over the acquisition, use, or disposition of United States property (real or personal, tangible or intangible), including establishing policies or

¹⁷⁸ Isamu Yamauchi & Sadao Nagaoka, *Does the outsourcing of prior art search increase the efficiency of patent examination? Evidence from Japan*, 44 RESEARCH POLICY 1601, 1602.

¹⁷⁹ OFFICE OF MGMT. & BUDGET, EXECUTIVE OFFICE OF THE PRESIDENT, OMB CIRCULAR A-76, at A-2, available at http://www.whitehouse.gov/omb/circulars/a076/a76_incl_techcorrection.pdf.

procedures for the collection, control, or disbursement of appropriated and other federal funds.¹⁸⁰

Therefore, to ensure the USPTO complies with these rules, we recommend the agency screen all patents to rule out any that would fall into any of the four scenarios above. And of course, contracted firms will be required to comply with all U.S.C. provisions including 35 U.S.C. §181 pertaining to the secrecy of certain inventions and protocols for when the patent application involves national security interests. In addition to being legally and technically competent, private search firms will need to confirm no conflict of interest exists between the firm and the searches it handles and will need to abide by strict confidentiality standards.¹⁸¹ Additionally, contracted firms should be required to state in writing that they will not misuse any government information they acquire during the partnership. These requirements can easily be made self-enforcing, to some degree, by ensuring that a private firm would be debarred from bidding for prior art search and subject to private or even criminal liability for breaches.

The second potential issue concerns motivating examiners to utilize the outsourcing mechanism. Currently, a Supervisory Patent Examiner (SPE) assigns applications to non-SPEs. Not only will SPEs need to be given clear criteria and adequate training for properly classifying applications, but incentives for SPEs to classify applications accurately will likely be necessary. Discussions of privatizing government functions often yield concern that government employees will lose jobs. If USPTO employees are dissatisfied with outsourcing the prior art search, incentives will be necessary for the agency to categorize applications that are simple, as simple, as opposed to complex. When the application reaches the USPTO, someone must be responsible for making this determination. One way of incentivizing SPEs to classify applications accurately could be to hire several external reviewers (non-civil servants) to make their own determinations of whether a randomly selected group of applications is simple or complex. The average breakdowns of these groups would then be calculated and then compared to the breakdowns of the SPEs overall breakdowns concerning whether an application was simple or complex. If the SPEs averages are within a pre-determined boundary of the averages of the external reviewer, then the SPE is awarded additional points that will ultimately grant them a higher year-end bonus. However, this is just one example—many possible programs could incentivize SPEs to accurately classify applications. For example, the compensation of SPEs could be arranged to give them a personal stake in outsourcing prior art search in simple cases.

The third potential issue relates to the psychological tendencies of examiners. There is research suggesting that the reason why examiners do not rely on applicant-submitted prior art is because they did not find the art themselves. Cotropia and Lemley comment that while “examiner worksharing suggests it may be possible for training to raise the salience of outside prior art in the minds of examiners, and hence cause them to pay more attention to that art,” “strong evidence that training will work” is necessary before investing significantly in the prior art search.¹⁸² The authors base this proposition in their hypothesis that cognitive bias is one reason why their empirical research showed that examiners do not rely on applicant-submitted

¹⁸⁰ OFFICE OF MGMT. & BUDGET, EXECUTIVE OFFICE OF THE PRESIDENT, OMB CIRCULAR A-76, at A-2, available at http://www.whitehouse.gov/omb/circulars/a076/a76_incl_techcorrection.pdf.

¹⁸¹ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 283, 283 (2003).

¹⁸² Christopher A. Cotropia & Mark Lemley, *Do applicant patent citations matter?* 42 Research Policy 844, 851 (2013)

prior art.¹⁸³ As the authors explain, “people tend to think more highly of things they do themselves than things others provide to them.”¹⁸⁴ One solution to this problem could be the following: if an examiner is responsible for a simple application in which the prior art search has been outsourced, then the examiner should be prohibited from searching for prior art. If an examiner has reason to believe the search firm’s results have under-delivered, she should need to go through an appeal process in which she describes the grounds for her belief, and then upon the discretion of the SPE, the examiner may be permitted to search for additional prior art. But this is only one of many possible solutions.

We are somewhat reluctant to go down the path of searching for psychological reasons for examiner behavior, when almost all of their behavior can be explained by straightforward incentives under the system. Another solution to the problem of examiners preferring to do the search themselves is to give them a direct reward based on the efficiency gains from outsourcing. A decision to cancel those efficiency gains by conducting a second search would then be a decision to cancel the private reward.

3. Implementing the Solution

The 21st century plan already provided some framework for how the USPTO could implement outsourcing. The 21st century plan included details on how the agency may ensure that contracted search services would conduct high quality searches.¹⁸⁵ This involved the USPTO “perform[ing] a proof of concept pilot using international (PCT) applications as the foundation for competitively sourcing search activities,” which would enable the USPTO to determine “the feasibility of competitively outsourcing prior art searches across a myriad of technologies.”¹⁸⁶ For the outsourcing initiative to be successful, strong public management by the USPTO will be necessary. Thus, as the 21st century plan included, the USPTO should use methods such as “in-process review procedures, separate searches performed by experienced patent examiners, and independent reviews of comparative results” to assess the work product of contractors.¹⁸⁷

In terms of phasing in the outsourcing initiative, we suggest that the USPTO refrain from a pilot that relies on volunteers from applicants. As Lisa Ouellette has highlighted in her work, the USPTO has a history of approaching pilots in this way, and this has made it hard to draw meaningful conclusions.¹⁸⁸ Thus, we suggest the USPTO introduce the outsourcing initiative by classifying each newly received application as either simple or complex, and then from there, randomly selecting a set number of simple applications to outsource to a private search firm. Because empirical data on outsourcing complex applications is non-existent, we would also encourage the USPTO consider experimenting with outsourcing complex applications down the road.

¹⁸³ See *id.*

¹⁸⁴ See *id.* (citing Christopher Buccafusco & Christopher Sprigman, *Valuing Intellectual Property: An Experiment*, 96 CORNELL L. REV. 1 (2010))

¹⁸⁵ Edward R. Kazenske, *The Future of Prior Art Searching at the United States Patent and Trademark Office*, 25 World Patent Information 284 (2003).

¹⁸⁶ See *id.*

¹⁸⁷ See *id.*

¹⁸⁸ See Lisa Larrimore Ouellette, Pierson, Peer Review, and Patent Law, 69 VAND. L. REV. 1825 (2016).

IV. ADOPTING A PATENT BOX AND A PROGRESSIVE MAINTENANCE FEE SYSTEM

Introduction

Here we offer a two-part proposal to amend how taxes and fees for patents are determined – that is, how to fund the patent system. In the first subsection (A) we argue that the U.S. should implement a patent box. This will lower the taxes a company owes on their patent profits from the current 21% corporate tax rate to 5% (or any other lower rate that seems desirable). In the second subsection (B), we argue that the USPTO should implement a progressive maintenance fee system where instead of paying set flat rates at three points along the patent’s lifespan, the patentee pay the USPTO 2% of their patent profits on a yearly-basis. These two policy changes will bring several benefits which include encouraging R&D, keeping profits domestic, and, as we are primarily concerned with, providing more funding to the USPTO. As we will outline, this increase in revenue will allow the USPTO to improve operational efficiencies and issue stronger patents.

A. Implementing a Patent Box

Whether innovators should receive a patent or a prize is a simple and old question to which we answer, “both.”¹⁸⁹ Prior literature notes that tax incentives have been largely neglected in this debate.¹⁹⁰ Our proposed ‘prize’ takes the form of a preferential tax regime—patentees are given the opportunity to opt into a patent box. A patent box lowers the taxes on what businesses earn from their patents to a rate that is below the statutory corporate tax rate. And unlike existing tax credits, our prize is only awarded after the recipient has created a commercially successful product.

The U.S. would not be the first country to implement a patent box. Many countries in the EU, as well as China, India, Australia, and the United Kingdom, have introduced some form of a patent box, with varying income tax rates. For example, some countries such as Portugal and Poland have very low rates—3.15% and 5% respectively. Others such as Turkey and the UK have much higher rates—12.5% and 10% respectively. The point of the box is that it allows for entities to pay a lower tax rate on patent profits than the general corporate tax rate, which in the U.S. is 21%. These countries have adopted a patent box to incentivize companies to keep patent profits domestic and encourage firms to engage in more R&D directed toward patent-eligible products.¹⁹¹ Given how many countries have implemented a patent box, it is unsurprising that in the U.S there has been some congressional interest in introducing a patent box here. For example, there was the Feinstein proposal which provided a 15% tax rate on income from patents

¹⁸⁹ Hylton, Keith N., A Patent and a Prize (February 8, 2023). Boston Univ. School of Law Research Paper No. 23-7, available at SSRN: <https://ssrn.com/abstract=4351974> or <http://dx.doi.org/10.2139/ssrn.4351974>, forthcoming in the *Review of Law and Economics*.

¹⁹⁰ See Daniel J. Hemel & Lisa Larrimore Ouellette, *Beyond the Patents-Prizes Debate*, 92 TEX. L. REV. 303, 307 (2013) (explaining how “[e]ven highly sophisticated analyses of innovation policy levers omit any mention of tax law amid discussions of patents, prizes, and grants”).

¹⁹¹ Daniele Fabris, *To Open the Box Or to Close the Box: Patent Box Regimes in the EU between R&D Incentives and Harmful Tax Practices*, 11 AMSTERDAML.F. 33, 37 (2019) (“It is precisely to attract high-tech companies and R&D activities within their jurisdictions, and to prevent them from transferring their intangible assets abroad, that several countries in the last decade have enacted [patent boxes].”).

developed and used for manufacture in the U.S., the Boustany and Neal proposal and H.R. 2605 which produced a 10% rate by allowing a 71% deduction of income.¹⁹² As we will explain in further detail, our proposal differs from these previous proposals because it includes the caveat that if a firm opts in, it must pay the USPTO 2% of its profits. This novel aspect makes our version of the patent box more akin to a progressive tax system, as firms are required to pay a fee to the USPTO that reflects their patent profits.

Each firm will be responsible for creating a calculation for relevant patent profits. Examples of profits eligible for the patent box include income from direct sales of the product, licensing and royalties, and damages arising out of infringement suits. If the patentee opts into the patent box, it will receive a tax break on its patent profits. However, in return, the patentee will pay 2% of its profits to the USPTO in lieu of the standard maintenance fees. For patentees that have opted into the patent box, the USPTO will collect fees on a yearly basis, as opposed to collecting fees at 3.5, 7.5, and 11.5 years after issuance. Thus, by opting into the box, patentees will pay less in taxes, but more directly to the USPTO. Although this will result in fewer tax dollars overall, the patent box will bring several benefits to the economy that offset this loss in tax revenue.

First, because the U.S. lacks a patent box, many U.S. companies—especially those in highly profitable areas such as the pharmaceutical and technology industries—shift profits from patents developed in the U.S. to their foreign subsidiaries located in countries with more favorable tax treatment to patent profits. By doing so, the company can pay lower taxes on its patent profits. In this scenario, the U.S. government only receives taxes accumulated once the income is repatriated. A patent box will encourage companies to keep patent profits in the country, and consequently, the U.S. will retain this income instead of essentially donating it to a foreign jurisdiction. Thus, a patent box will help the U.S. mitigate the ongoing issue of base erosion. Second, by lowering the tax rate for patents, the patent box is an *ex post* incentive as firms do not enjoy a benefit until after their innovation is a demonstrated market success. The two most common types of *ex post* incentives are patents themselves, and prizes. However, when it comes to tax policy for patents, the U.S. has especially focused on *ex ante* incentives.

Ex ante incentives—incentives to engage in R&D and other innovative activities before a result is achieved—have several benefits. First, they improve the time value of money. A firm having more money today allows the firm to invest money in a manner that will lead to a deeper return in the long-run compared to a firm that does not have as much money on hand and will therefore lose out on a larger return on investment.¹⁹³ *Ex ante* incentives such as R&D grants and tax credits provided by state and federal governments and nonprofits such as universities and private foundations help U.S. firms gain a competitive advantage in global markets.¹⁹⁴ But because R&D is a risky endeavor with no guarantee of success, firms need many incentives to engage in it, whether it be via credits or grants. And grants provide opportunities for firms that would otherwise not be able to shore up the necessary capital for R&D in the first place. Therefore, between that and the time-value of money, *ex ante* incentives such as R&D tax credits

¹⁹² Jane G. Gravelle, *A U.S. Patent Box: Issues*, CRS Insight, Oct. 15, 2015.

¹⁹³ Kyle Beczkiewicz, *Weighing the Patent Box: An Evaluation of the Ex Post Tax Incentive of a Lower Tax Regime for Products That Incorporate Patents*, 25 Marquette Intellectual Property & Innovation Law Review 41, 44 (2021).

¹⁹⁴ Nirupama Rao, *Do tax credits stimulate R&D spending? The effect of the R&D tax credit in its first decade*, 140 Journal of Public Economics 1 (2016).

are necessary, especially in areas where projected revenue is low.¹⁹⁵ Furthermore, *ex ante* incentives such as research grants and grants and contracts with private research labs facilitate relationships, which *ex post* incentives simply are not directed towards doing.

Despite the benefits *ex ante* incentives can bring, they have several drawbacks. First, *ex ante* incentives are highly speculative. There is no guarantee that providing a tax break up front to a firm will result in the firm engaging in R&D that leads to a successful product or service.¹⁹⁶ Relying solely on these incentives is somewhat inefficient because without requiring that firms create a successful product or service, the incentive for them to succeed is lower, as well as the stakes of failure.¹⁹⁷ Thus, the granter of the *ex ante* incentive takes on more direct financial risk. And existing *ex ante* incentives such as the section 174 general Research and Experimentation Credit (R&E), are not immune from this problem. The R&E credit incentivizes firms to increase their research spending by providing a tax credit of up to 20% of their spending and allowing firms to deduct these expenses immediately as opposed to over a number of years. There is also section 41, which offers a tax credit for companies if they increase their R&D expenditures. Together, section 174 and 41 cost taxpayers billions each year.¹⁹⁸ Second, R&D tax credits are far larger in scope than the patent box, as they do not require the recipient to actually produce a successful product. Additionally, the spending need not relate to potentially patentable innovations only.

Our proposal will reward companies for developing innovations that are proven successful in the market. We are not suggesting that the government take away R&D credits. Patent boxes are a logical next step to R&D tax credits because while R&D credits incentivize activity often leading to innovation, patent boxes incentivize firms to keep profits domestic.¹⁹⁹ And unlike R&D tax credits which do not compensate the USPTO in exchange for the patentee's innovative activity, our novel requirement that firms must pay the USPTO 2% of their patent profits in lieu of maintenance fees will help offset the economic risk involved with the patent box. This is because although companies on the whole will pay less in taxes, most entities will be required to pay substantially more money to the USPTO than they are required to under the current regime. This is balanced approach—although firms will pay the USPTO more money if they make more money, firms will enjoy a generous tax break across all patent profits if they elect into the box.

¹⁹⁵ Kyle Beczkiewicz, *Weighing the Patent Box: An Evaluation of the Ex Post Tax Incentive of a Lower Tax Regime for Products That Incorporate Patents*, 25 Marquette Intellectual Property & Innovation Law Review 41, 44 (2021).

¹⁹⁶ *See id.*

¹⁹⁷ *See id.* (“Without a requirement for success in order to realize the benefits of an up-front reward, the incentive to succeed is lower and the stakes of failure are lower, making the incentive somewhat less efficient.”); Lisa Larrimore Ouellette, *Patentable Subject Matter and Nonpatent Innovation Incentives*, 5 UC IRVINE L. REV. 1115, 1127 (2015).

¹⁹⁸ Lisa Larrimore Ouellette, *Patentable Subject Matter and Nonpatent Innovation Incentives*, 5 UC IRVINE L. REV. 1115, 1132 (2015) (explaining that in 2014 section 174 and 41 cost U.S. taxpayers \$11 billion) (citing) STAFF OF THE JOINT COMM. ON TAXATION, 113TH CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2012–2017, at 30 tbl.1 (Comm. Print 2013), <http://www.taxpayer.net/images/uploads/JCT%20Tax%20Expenditure%20report%202013.pdf> [<http://perma.cc/6XCM-U3DK>].

¹⁹⁹ Daniele Fabris, *To Open the Box Or to Close the Box: Patent Box Regimes in the EU between R&D Incentives and Harmful Tax Practices*, 11 AMSTERDAML.F. 33, 37 (2019) (quoting J.M. Brown, ‘Patent Box Taxation: A Comparison of Four Recent European Patent Box Regimes and an Analytical Consideration of If and How the United States Should Implement Its Own Patent Box,’ in *The International Lawyer*, 2012-46, pp. 913 ff.

More importantly, the overall net welfare benefit from the patent system would increase as a result of the patent box. The reason is simple.²⁰⁰ Take the case where the patent generates a new product, and new market. Under the patent system, the patentee gets a monopoly with the corresponding “monopoly profit” in this new market. Thus, the benefit or reward to the patentee is equal to the monopoly profit. Consumers get the consumer surplus that is generated by this new market. Society as a whole gets the sum of the monopoly profit and consumer surplus. However, the fact that the patentee does not share in the consumer surplus means that its incentives are not as great as they should be. In other words, the patentee invests \$1 into R&D, he receives \$1 in profit and consumers receive \$1 in surplus. The patentee will never choose to invest more than the \$1 reward under this scheme – because investing more than \$1 and receiving only \$1 in return would be unprofitable. But since the total social reward is \$2, it would be ideal to have a system that permits the patentee to obtain more than \$1 in reward. Such a system would induce more innovation to the benefit of the entire society.²⁰¹ The patent box, in effect, approximates such a system. Thus, it necessarily enhances the wealth of the entire economy. Although it may seem that the government is giving up some tax revenue, both the government and the entire society gain more in return by increasing the total market value of goods and services in the economy. Because the total value of goods and service in the economy grows as a consequence, government makes more tax revenue overall.

This argument is illustrated by the monopoly diagram shown in Figure 1. In the diagram, the top triangle denoted “Consumer Surplus” shows the additional wealth created by the patent that the patentee does not ordinarily share in. Because the patentee does not share in this additional wealth, its incentive to innovate is less than socially ideal. The patent box can enable the patentee to share in this portion of additional wealth.

²⁰⁰ Hylton, Keith N., A Patent and a Prize (February 8, 2023). Boston Univ. School of Law Research Paper No. 23-7 , Available at SSRN: <https://ssrn.com/abstract=4351974> or <http://dx.doi.org/10.2139/ssrn.4351974>, forthcoming in the *Review of Law and Economics*.

²⁰¹ *See Id.*

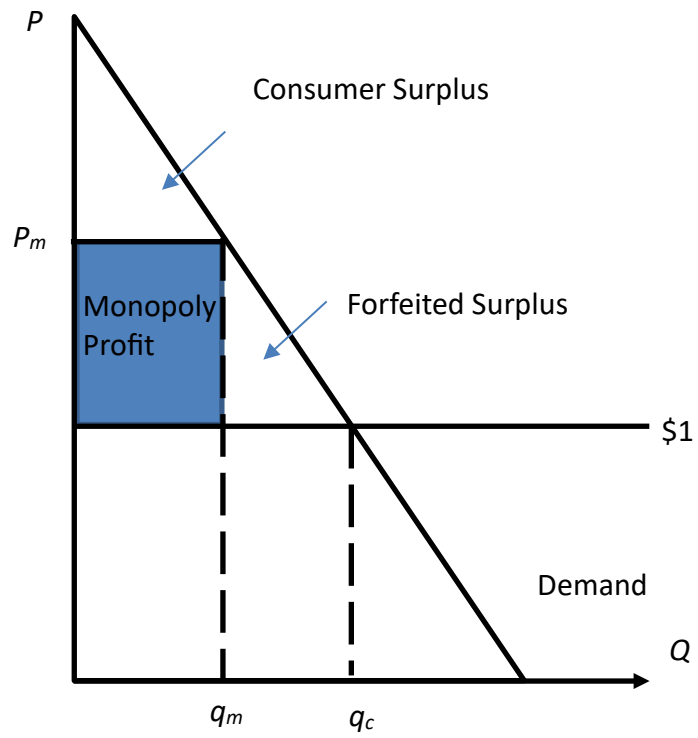


Figure 1: Patent Monopoly, showing Consumer Surplus, Profit, and Forfeited Surplus

Some considerations concerning fraud are in order. First, a large penalty for lying about patent profits should be in place to deter companies from being dishonest. Overtime, it is likely that companies will become more creative in finding ways to include income that isn't directly from a patented product. This brings up another important point. Companies could report income from a large project as 'patent income,' even if the product only includes one patented component.²⁰² Policymakers will need to decide whether this is worth policing. For example, the average smartphone may be protected by up to 250,000 patent claims.²⁰³ But some products only have one. Policing this may be unrealistic. Therefore, at least at the outset, it might be best to have a system where as long as the product contains a patent, it is patent-derived income. Lines could also blur in scenarios such as this: there is a single product, say a refrigerator that contains patented components, and add on products that do contain one or more patented components are sold separately. If the add-ons are not sold with the refrigerator in the same stock keeping unit, the company should not be permitted to claim the refrigerator itself as patent-derived income. In this case, if the add-ons, say a filter for the ice maker, are sold separately, then the company should only be permitted to claim those add-ons as profits eligible for the box. The refrigerator would be excluded because no patented components are embedded in it. If there is too much concern that creative strategies to include non-patent profits in the box, another option for protecting against this behavior could be to reduce patent box eligibility to certain industries only. For example, at least at the outset, only pharmaceutical drugs, could be eligible for the patent box.

B. Introducing a Progressive Maintenance Fee System

Fee setting and adjusting is governed by Section 10 of the AIA, which for the first time in history, granted the USPTO Director the authority to "set or adjust by rule all patent and trademark fees established, authorized, or charged under Title 35 of the U.S. Code and Trademark Act of 1946."²⁰⁴ The SUCCESS Act of 2018 amended the AIA to vest the USPTO with this authority for an additional 8 years.²⁰⁵ With this authority, the USPTO can implement our fee re-structuring proposal. Literature specifically addressing maintenance fee reform is limited. Locke (2023) proposes an annuity system where "yearly payments are made to the USPTO as annuities on the anniversary of the earliest U.S. non-provisional or PCT application within a patent family."²⁰⁶ While collecting fees on a yearly-basis is logical, our proposal is more complex.

²⁰² <https://www.americanprogress.org/article/patent-tax-dodge-why-the-patent-box-does-not-answer-americas-need-for-tax-reform/> ("But the long-term revenue loss could grow as companies find ways to include other income in the box, such as income related to a large product that includes one small patented part, a criticism raised over the U.K. patent box.").

²⁰³ See Nat Watkins, Inside Big Tech's Race to Patent Everything, WIRED, Mar. 15, 2022, <https://www.wired.com/story/big-tech-patent-intellectual-property/>.

²⁰⁴ Fee Setting and Adjusting, USPTO, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting> (last accessed Oct. 8, 2023).

²⁰⁵ H.R. 6758 Public Law 115-273, <https://www.congress.gov/115/plaws/publ273/PLAW-115publ273.pdf> (granting 8-year extension of USPTO's "authority to set the amounts for the fees it charges, and for other purposes.")

²⁰⁶ Scott D. Locke, Is It Time to Replace the U.S. Patent Maintenance Fee System with Annuities?, 63 IDEA 466, 478 (2023) (articulating how current patent maintenance fee framework is "at best a holdover from a twentieth, if not nineteenth century romanticized view of U.S.-based small entities and lone inventors being a sizeable percentage of patent applications and the benefits of spacing out their payments to the USPTO.")

The USPTO has a history of both raising and lowering fees over the years, depending on the agency's goals of incentivizing applications and improving operational efficiencies.²⁰⁷ The USPTO has expressed that shifting costs from the beginning of issuance, when value is uncertain, to later times when the patentee is in a better position to calculate its value, is a goal.²⁰⁸ Furthermore, the agency has discussed how "[i]ssue and maintenance fees from generated patents subsidize the cost of patent examination, including applications that ultimately are not allowed."²⁰⁹ Thus our proposal is well within the confines of existing USPTO fee-setting strategy. Although some might see the difference in maintenance fees some firms may owe under our proposed system and the current system as radical, when viewed alongside our other key provision—implementing a patent box—our approach is far more balanced than it seems. We will clarify this further in Subsection C, which offers a hypothetical showing what a firm might owe in taxes and fees under the current system compared to what they might owe under our proposed system.

The USPTO is entirely funded by user fees, which means the agency does not receive any taxpayer money.²¹⁰ The AIA enforces this by requiring that “patent fees be set so that prospective aggregate revenue recovers the prospective aggregate cost of patent operations—leaving a zero net cost to general taxpayers.”²¹¹ Furthermore, the aggregate revenue from patent fees may only recover the aggregate estimated operational costs.²¹² However, “Patent fees not used in support of current year operations are maintained as an operating reserve to mitigate the risk of uncertain demand and cash flow variability, and to maintain operations while recalibrating aggregate cost and revenue.”²¹³ Per section 10(b) of the AIA, as amended by the Unleashing American Innovators Act of 2022 (UAIA), proposed fees must include a 60% reduction for small entities and an 80% reduction for micro entities.²¹⁴ The UAIA increased these reductions from a previous 50% for small entities and 75% for micro entities.²¹⁵ The current fee schedule sets a \$2,000 maintenance fee due at 3.5 years after issuance, \$3,760 due at 7.5 years after issuance, and

²⁰⁷ Oversight of the United States Patent and Trademark Office, House Committee on the Judiciary, May 22, 2018, <https://www.youtube.com/watch?v=rP4OZM5o48g> (explaining how USPTO lowered trademark electronic filing fee to encourage electronic filings and thus improve operational efficiencies).

²⁰⁸ Olson, David S., Removing the Troll from the Thicket: The Case for Enhancing Patent Maintenance Fees in Relation to the Size of a Patent Owner's Non-Practiced Patent Portfolio (August 30, 2013). Florida Law Review, Vol. 68, No. 2, 2017, Boston College Law School Legal Studies Research Paper No. 303, Available at SSRN: <https://ssrn.com/abstract=2318521> or <http://dx.doi.org/10.2139/ssrn.2318521>.

²⁰⁹ Patent Fee Proposal Background Information, slide 7, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>.

²¹⁰ Oversight of the United States Patent and Trademark Office, House Committee on the Judiciary, May 22, 2018, <https://www.youtube.com/watch?v=rP4OZM5o48g>.

²¹¹ Patent Fee Proposal Background Information, slide 7, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>.

²¹² Fee Setting and Adjusting, USPTO, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting> (last accessed Oct. 8, 2023).

²¹³ Patent Fee Proposal Background Information, slide 6, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>.

²¹⁴ The definition for “smallly entity” and “micro entity” are provided in 35 U.S.C. § 41(h)(1) and Section 11(g) of the AIA, respectively. Fee Setting and Adjusting, USPTO, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting> (last accessed Oct. 8, 2023).

²¹⁵ Fee Setting and Adjusting, USPTO, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting> (last accessed Oct. 8, 2023).

\$7,700 due 11.5 years after issuance.²¹⁶ If the patentee fails to pay a maintenance fee, the patent will be considered abandoned six months after the fee due date.

Fee diversion, a controversial policy, requires the USPTO only keep its estimated operational costs—the rest of the money brought in by the agency is given to and controlled by congress to fund other government matters.²¹⁷ As of July 2023, throughout the past twenty-five years, over \$1 billion in patent fees have been diverted to other government agencies.²¹⁸ In the fiscal year 2022, the USPTO collected \$3,630 million in total patent fees.²¹⁹ Currently, there is approximately \$1.2-1.3 billion that the USPTO cannot access due to fee diversion.²²⁰ Opponents of fee diversion have stressed for decades that the policy “undoubtedly impairs the ability of the USPTO to invest strategically in the personnel and equipment needed to improve quality of examination and drive down pendency.”²²¹ The majority of congress wants fee diversion to remain in place, whereas the USPTO does not. The central purpose amending the fee system is so that the agency has more leeway to invest in several aspects of the examination process. Therefore, upon implementing this proposal, if fee diversion remains alive, congress should allow the USPTO to leverage this new revenue—the revenue should not bypass the USPTO and go towards general federal spending. Subsection D provides examples of potential changes and investments the USPTO should make.

C. Hypothetical

The following hypothetical illustrates the differences between how taxes and fees imposed by the current system differs than what our proposed system will impose. Suppose you are Samsung and profiting \$399 million dollars from the sale of your smartphones.²²² Under the current system, after the patent for this smartphone had been granted, the only money the USPTO will ever receive from the patentee is maintenance fees and applicable late payments of these fees. The maintenance fees are lower if the patentee is considered a ‘small entity,’ and even lower if they are considered a ‘micro entity,’ but for the sake of this exercise I will base my estimated totals on what a standard entity would owe.²²³ The maintenance fee schedule requires that for a standard entity to maintain an original or any reissue patent, they must pay \$2,000 due

²¹⁶ USPTO fee schedule, <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Maintenance%20Fee>.

²¹⁷ Intellectual Property Owners Association, Understanding Patent Fee Diversion and How It is Affected by Current Senate and House Patent Reform Bills, Sept. 6, 2011, https://ipo.org/wp-content/uploads/2013/03/Understanding.Patent.Fee_.Diversion.pdf.

²¹⁸ Senate Judiciary Committee Holds Hearing on Oversights of U.S. Patent and Trademark Office, July 26, 2023, 51:30, https://www.youtube.com/watch?v=5pnoH4q_0zA.

²¹⁹ These fees are derived from patent maintenance fees (52%), patent filing, search, and exam fees (25%), patent-post allowance fees (10%), Patent Cooperation Treaty fees (6%), patent extension of time fees (3%), PTAB fees (2%), and other patent fees (2%). Patent Fee Proposal Background Information, slide 29, <https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>.

²²⁰ Brian P'Shaughnessy, Diversion of USPTO user fees is a tax on innovation, May 17, 2016, IP Watchdog, <https://ipwatchdog.com/2016/05/17/diversion-uspto-user-fees-tax-innovation/id=69070/>; Senate Judiciary Committee Holds Hearing on Oversights of U.S. Patent and Trademark Office, July 26, 2023, 46:00, https://www.youtube.com/watch?v=5pnoH4q_0zA.

²²¹ Brian P'Shaughnessy, Diversion of USPTO user fees is a tax on innovation, May 17, 2016, IP Watchdog, <https://ipwatchdog.com/2016/05/17/diversion-uspto-user-fees-tax-innovation/id=69070/>;

²²² \$399 million is Samsung's entire profit from the sale of its smartphones that the Federal Circuit found to be infringing in *Apple Inc. v. Samsung Elecs. Co.*, 786 F.3d 983 (Fed. Cir. 2015). This example is a solely a hypothetical pretending that Samsung had in fact owned the infringing patent in its smartphones, and that Apple was not involved.

²²³ In 2023, small entities pay \$800, \$1,504, and \$3,080 at each fee milestone, and micro entities pay \$400, \$752, and \$1540 respectively.

at 3.5 years after issuance, \$3,760 due at 7.5 years after issuance, and \$7,700 due at 11.5 years after issuance.²²⁴ Additionally, profits from this patented device (if Samsung kept them in the U.S.) would be taxed at the standard 21% rate. Here we focus on two forms of outgoing payments owed by Samsung: fees and taxes. In terms of fees for the patented the smartphones, Samsung would only pay the USPTO \$13,460 (post-issuance) for a patent that went on to bring Samsung \$399 million dollars in revenue. Regarding taxes, since Samsung's profits would be subject to the standard 21% rate, they would owe roughly \$83.79 million in taxes. But our proposal will change these numbers, resulting in more revenue to the USPTO, and less to the IRS. Under our proposed system, Samsung, instead of paying flat periodic maintenance fees, would pay 2% of their patent profits each year. Thus, Samsung would pay \$7.98 million to the USPTO in fees. However, Samsung would only be *taxed* only 5% on the profits from their patented device. Thus, they would only pay \$19.95 million in taxes.

D. The USPTO Should Use the Increased Revenue to Engage a More Skilled Workforce and Improve Employment Retention Rates

The increased revenue from this proposal to lower taxes and increase fees will allow the USPTO to improve examination in at least two ways. First, the agency will be able to attract examiners with more advanced technical degrees by offering professional wages. Righi & Simcoe show that more specialized examiners “have a lower grant rate and produce a larger narrowing of claim-scope during the examination process.”²²⁵ However, only four percent of examiners have a Ph.D.²²⁶ Additionally, this revenue can be used to hire contracted technical experts that will improve the agency's ability to assess enablement in applications, as proposed by Ouellette (2016).²²⁷ Particularly in light of privatizing the prior art search, the USPTO should seek to improve significantly its most valuable asset: people. Determining patentability, even without searching for prior art, is a tall order. The agency should bring examiners with deeper backgrounds in their technical classes as well as invest in hiring contracted experts for applications dealing with more niche and difficult technology.

V. CONCLUSION

Under our proposed model, (1) applicants should not have a duty to disclose prior art (2) the USPTO should outsource prior art searches for ‘simple’ applications, but should conduct internal searches when the application is ‘complex’, as in Japan; and (3) the USPTO should implement a patent box and impose a progressive maintenance fee system.

Our suggested changes aim to improve the efficiency and quality of patent examination, which will help the USPTO issue stronger patents. Eliminating the applicant's duty to disclose will alleviate the inefficiency of applicants spending time and money on disclosing materials that ultimately go ignored by examiners. It will also strengthen patentees and lower litigation costs by

²²⁴ <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Maintenance%20Fee>

²²⁵ Cesare Righi & Timothy Simcoe, *Patent examiner specialization*, Research Policy 137, 138 (2019).

²²⁶ Ronald J. Mann, *The Idiosyncrasy of Patent Examiners: Effects of Experience and Attrition*, 92 TEX. L. REV. 2149, 2163 fig.2 (2014).

²²⁷ See Lisa Larrimore Ouellette, *Pierson, Peer Review, and Patent Law*, 69 VAND. L. REV. 1825 (2016).

eliminate the viability of *Walker Process* claims, but not *Handgards* claims. This will strike a fair balance between strengthening patent holder rights while still ensuring patent holders will be held accountable for egregious misconduct. Outsourcing should produce fewer oversights as private search firms will have incentives to search efficiently, including developing new search technology. The potential for this is particularly exciting as we are amidst a surge in AI capabilities. Moreover, outsourcing will allow examiners to specialize in evaluation, which will improve examiner workload and retention. Finally, implementing a patent box and progressive maintenance fee system will serve as a balanced approach to incentivizing innovation and providing the agency with funding to invest in improving its workforce. This may be accomplished by attracting more qualified examiners with professional wages, and creating a robust budget for contracting with experts to assess enablement in applications dealing with more niche or complex technologies.