

Improving the Patent Notice System: Replacing the Duty to Mark with a Unified Patent-Product Database

Dylan Nguyen*

ABSTRACT: The U.S. patent system is deficient in giving the public proper notice of what technologies are under patent protection. The current system relies on patent marking, which involves imprinting products with patent information that cover the product, to give constructive notice to the public. Recent data indicates that marking products with a website—called virtual marking—is not widely used. The problem lies with the overall costs, risks, and impracticability of marking certain products. Given the already dubious nature of constructive notice, the lack of virtual marking is a sign that patent law should improve its notice system. The lack of notice contributes to innocent infringement and an overall high societal cost that cuts against innovation. This Note argues that a unified patent-product database would improve notice to inventors to prevent infringement and generally encourage innovation. The database could borrow ideas from an effective database like the Food and Drug Administration’s “Orange Book,” a well-established drug database for the pharmaceutical industry. This Note also looks into how other components of the Patent Notice System would be improved, including the current U.S. patent database and the patent disclosure system.

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* J.D. Candidate, The University of Iowa College of Law, 2021; B.A., University of California, Los Angeles, 2016.

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I. INTRODUCTION

On June 19, 2018, the U.S. Patent and Trademark Office (“USPTO”) issued its ten millionth patent since the first patent (under the current numbering system) was granted in 1836.¹ This milestone reflects the staggering number of patents issued annually.² From when the current numbering system started, it took 75 years for the USPTO to issue the one millionth patent in 1911.³ A century later, in 2011, the USPTO issued its eight millionth patent.⁴ And, by 2018, the USPTO had granted two million additional patents in just seven years.⁵

The sheer number of patents issued has been attributed to many different causes ranging from the rise of big technology companies like Google⁶ to an inadequate review process by the USPTO.⁷ Whatever the causes,

1. *United States Issues Patent Number 10,000,000*, U.S. PAT. & TRADEMARK OFF. (June 19, 2018), <https://www.uspto.gov/about-us/news-updates/united-states-issues-patent-number-10000000> [<https://perma.cc/XMW9-QLBV>].

2. *See U.S. Patent Activity: Calendar Years 1790 to the Present*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm [<https://perma.cc/ST8Q-VTU6>] (presenting yearly annual rate of issued patents with notable increases in recent years); Nilay Patel, *The US Patent Office Has Issued 10 Million Patents*, VERGE (June 19, 2018, 12:59 PM), <https://theverge.com/2018/6/19/17478898/uspto-utility-patents-10-million-issued> [<https://perma.cc/9C6M-JLK9>].

3. *Millions of Patents*, U.S. PAT. & TRADEMARK OFF. (Feb. 7, 2018, 7:03 PM), <https://www.uspto.gov/learning-and-resources/ip-motion/millions-patents> [<https://perma.cc/H8P8-A5PV>].

4. *Id.*

5. *See United States Issues Patent Number 10,000,000*, *supra* note 1.

6. *See generally* CB INSIGHTS, *THE ‘BIG 5’ PATENTS REPORT: PATENT ACTIVITY AND TRENDS ACROSS AMAZON, APPLE, FACEBOOK, GOOGLE, AND MICROSOFT* (2016), <https://www.cbinsights.com/reports/tech-patents-report.pdf> [<https://perma.cc/P52T-CJ2P>] (noting that patent applications have been on the rise).

7. MICHAEL D. FRAKES & MELISSA F. WASSERMAN, *HAMILTON PROJECT, DECREASING THE PATENT OFFICE’S INCENTIVES TO GRANT INVALID PATENTS* 5 (2017), https://www.brookings.edu/wp-content/uploads/2017/12/es_121317_decreasing_patent_office_incentives_grant_invalid_patents.pdf [<https://perma.cc/FSY8-NGZE>].

the growth of patents has led to a booming economy surrounding intellectual property.⁸ By 2012, a Commerce Department study concluded “that ‘intellectual property intensive industries support at least 40 million jobs and contribute more than US \$5 trillion to, or 34.8 percent of, US gross domestic product.’”⁹

As impressive as the numbers are, the quantity of patent information presents a challenge in educating the public about it all.¹⁰ U.S. patent law strives to balance rewarding innovation and promoting the public good.¹¹ Patents reward innovation by granting a limited monopoly, and it promotes the public good by making the patent public knowledge.¹² Promoting the public good, however, requires a robust system that allows the public to easily access patent information whenever it needs to.¹³ This is the patent’s “teaching function.”¹⁴

While an online database stores U.S. patents,¹⁵ the law depends on patentees to mark their products with patent information.¹⁶ The patentee does this by imprinting a patent number on a given product.¹⁷ Ideally, the patent marking educates the public about the patent, thereby preventing unintentional patent infringement. But in reality, there is no guarantee that the public will see the product or the marking.¹⁸ The law, however, considers the marking enough to notify the public.¹⁹ As a result, the system relies on “constructive notice,” a legal fiction that the public was notified regarding the existence of a patent, even if the public never received actual notice.²⁰ Constructive notice, by its nature, runs the risk of “notice failure,” allowing the public to infringe on patents without realizing it.²¹

8. See Mihai Lupu, Katja Mayer, Noriko Kando & Anthony J. Trippe, *Preface to the Second Edition*, in CURRENT CHALLENGES IN PATENT INFORMATION RETRIEVAL, at v, v (Mihai Lupu, Katja Mayer, Noriko Kando & Anthony J. Trippe eds., 2d ed. 2017).

9. *Id.*

10. See *id.* at vi.

11. See *infra* Part II.

12. See *infra* Part II.

13. See *infra* Part II.

14. See generally Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621 (2010) (discussing how patents can serve as technical literature that helps drive innovation).

15. *Important Notices Concerning the Patent Full-Text and Full-Page Image Databases*, USPTO PAT. FULL-TEXT & IMAGE DATABASE [hereinafter USPTO DATABASE], <http://patft.uspto.gov/netahtml/PTO/help/notices.htm> [<https://perma.cc/V3RM-27Q4>] (last updated Dec. 21, 2017, 12:34 PM).

16. See *infra* Section II.B.

17. See *infra* Section II.B.

18. See *infra* Section III.B.

19. See *infra* Section II.B.

20. *Notice*, BLACK'S LAW DICTIONARY (11th ed. 2019).

21. See *infra* Part III.

The problem worsens because federal courts evaluate patent infringement on a strict liability basis.²² So inventors who innocently infringe on patents can be held liable without a finding of intent.²³ Combine strict liability with a marked product, inventors can accidentally infringe a patent without the intent to infringe or actual knowledge of their infringement. The resulting societal costs, such as spending the time and money to search for related patents, can discourage innovation.²⁴

But the next issue is how to organize all this patent information—both pending and approved. Organizing patents involves storing, managing, analyzing, and accessing patent information with minimal costs.²⁵ Thankfully, modern technology has advanced drastically over the last two decades to allow for improved organization and information retrieval capabilities.²⁶ There are a variety of search platforms that offer different features,²⁷ but there is potential to improve the entire system.

That potential comes from a database called the “Orange Book.” The Food and Drug Administration (“FDA”) created the Orange Book to educate the public about approved drugs in the marketplace.²⁸ The database includes relevant patent information for each drug.²⁹ The effectiveness of the Orange Book lies in its easily accessible nature. The public can search using intuitive fields, such as applicant company and the drug name.³⁰ The current patent system could use a similar easy-to-use system.

This Note argues that the United States could improve the patent teaching function by establishing a unified patent-product database that allows patentees to update their patents with information regarding which products are using their patents. This database would replace the duty to mark products by allowing patentees to fulfill the same duty by contributing their patent and product information to the database. Part II of this Note will introduce the background behind the patent notice system, including current patent search technology and the patent disclosure and marking systems. Part III will look into the outstanding issues and problems of the notice system. Finally, Part IV will introduce a proposal to create a unified patent-product database: using the Orange Book as a template for the database.

22. See *infra* Section III.C.

23. See *infra* Section III.C.

24. See *infra* Section III.C.

25. See *infra* Section II.C.

26. Lupu et al., *supra* note 8, at vi.

27. See *infra* Section II.C.

28. See *infra* Section IV.A.

29. See *infra* Section IV.A.

30. See *infra* Section IV.A.

II. BACKGROUND: PATENTS, ITS DISCLOSURE, MARKING, AND DATABASES

The American patent system is secured by the U.S. Constitution: “The Congress shall have Power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”³¹ Thereafter, Congress codified the patent system under Title 35 of the U.S. Code.³² The Code established the U.S. Patent and Trademark Office as the agency in charge of administering the patent and trademark system.³³ For patents, the USPTO employs patent examiners to evaluate whether to grant patents.³⁴ In addition to enforcing Title 35, the USPTO also promulgates and enforces its own set of regulations, which fall under Title 37 of the Code of Federal Regulations.³⁵ As long as the regulations are “[]consistent with the statutes . . . [that] they are derived [from], [they] have the effect of law.”³⁶

Some of the regulations promulgated by the USPTO govern how patents are issued. The process starts once patent applications are filed. Then, the USPTO begins its evaluation. This is the “patent prosecution” process.³⁷ Substantively, USPTO examiners assess each patent on several basic requirements such as: (1) usefulness or utility;³⁸ (2) eligible subject matter;³⁹ (3) novelty;⁴⁰ and (4) meeting the statutory disclosure requirements.⁴¹ The law also requires patentees to submit all “prior art”⁴² they are aware of to ensure that USPTO examiners can make an informed decision as to whether the sought-after patent is novel and nonobvious (among other criteria).⁴³

31. U.S. CONST. art. I, § 8.

32. See 35 U.S.C. § 1 (2018).

33. *Id.*

34. *Patent Examiner: Everything You Need to Know*, UPCOUNSEL, <https://www.upcounsel.com/patent-examiner> [<https://perma.cc/UD9D-24UZ>] (explaining the role of patent office examiners in the patent system and where their authority and standards come from).

35. See 35 U.S.C. §§ 1–2; 37 C.F.R. §§ 1–501 (2019).

36. *Piel v. Falkner*, 426 F.2d 412, 415 (C.C.P.A. 1970) (explaining that Congress gave the power for the USPTO to promulgate the necessary rules for its functions); see 35 U.S.C. § 1.

37. See generally PRAC. L. INTELL. PROP. & TECH., PATENT APPLICATION PROSECUTION: OVERVIEW (maintained), Westlaw W-001-0679 [hereinafter PRACTICAL LAW] (explaining the various steps a person must complete in order to fill out a patent application).

38. 35 U.S.C. § 101.

39. *Id.* note (Historical and Revision Notes); see also *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (interpreting 35 U.S.C. § 101 to exclude certain subject matter like “laws of nature”).

40. 35 U.S.C. § 102.

41. *Id.* § 112.

42. PRACTICAL LAW, *supra* note 37.

43. See Walid Magdy, Patrice Lopez & Gareth J.F. Jones, *Simple vs. Sophisticated Approaches for Patent Prior-Art Search*, in ADVANCES IN INFORMATION RETRIEVAL 725, 725 (Paul Clough et al. eds., 2011); Doreen Alberts et al., *Introduction to Patent Searching: Practical Experience and Requirements for Searching the Patent Space*, in CURRENT CHALLENGES IN PATENT INFORMATION RETRIEVAL, *supra* note 8, at 3, 7–12.

Prior art is anything related to the patent claims.⁴⁴ It includes patents, market information, press releases, product brochures, scholarship and journal-grade literature.⁴⁵ USPTO examiners also conduct their own prior art research.⁴⁶

“The USPTO has a goal of responding substantively to a new patent application within 14 months [of] the application filing date.”⁴⁷ The actual response time varies. On average, it takes about 15.9 months for an initial response, and about 22.6 months for a final decision.⁴⁸ The USPTO allows applicants to apply for an expedited process.⁴⁹

The USPTO collects patent applications through its electronic filing process called EFS-Web,⁵⁰ where patentees can quickly and securely submit PDF files entirely online.⁵¹ The website also accepts payment and updates.⁵² Updates can include changing personal information or amendments to patent claims or ownership.⁵³

A. PATENT DISCLOSURE

The U.S. patent system presents a balancing act between encouraging innovation and advancing the public good. First, the law encourages innovation by granting a 20-year monopoly for patentees by giving “the right to exclude others from making, using, offering for sale, or selling the invention.”⁵⁴ The “‘monopoly’ provides . . . a competitive advantage,” allowing patentees to commercialize their patents through various methods, including manufacturing, selling, and licensing the contents of the patent.⁵⁵ To maintain this monopoly, patentees must pay maintenance fees at certain intervals.⁵⁶ Second, in return for the monopoly, the law requires patentees to publicly disclose the contents of the patent.⁵⁷ This disclosure requirement allows the public to benefit from the information, whether through

44. See Alberts et al., *supra* note 43, at 12.

45. See *id.*

46. Magdy et al., *supra* note 43, at 725.

47. PRACTICAL LAW, *supra* note 37.

48. WORLD INTELL. PROP. ORG., WORLD INTELLECTUAL PROPERTY INDICATORS 2017, at 27 (2017), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2017.pdf [<https://perma.cc/LJ5F-DC3D>].

49. PRACTICAL LAW, *supra* note 37.

50. See *About EFS-Web*, U.S. PAT. & TRADEMARK OFF. (Apr. 20, 2020, 2:00 PM), <https://www.uspto.gov/patents-application-process/applying-online/about-efs-web> [<https://perma.cc/2YFU-ZEUX>].

51. See *EFS-Web Guidance and Resources*, U.S. PAT. & TRADEMARK OFF. (Mar. 19, 2020, 3:58 PM), <https://www.uspto.gov/patents-application-process/applying-online/efs-web-guidance-and-resources> [<https://perma.cc/EGQ7-55ZW>].

52. See *id.*

53. See *id.*

54. 35 U.S.C. § 154(a)(1)–(2) (2018).

55. See Alberts et al., *supra* note 43, at 4.

56. See *id.*

57. See 35 U.S.C. § 112(a).

replicating the invention after the patent expires or making additional breakthroughs.⁵⁸ Other benefits for the public include helping avoid unnecessary duplication by keeping the public informed of an industry's innovative progress, allowing patent examiners to fairly evaluate a patent's merits, and determining if the patentee possesses enough information to indicate that he or she actually discovered the invention.⁵⁹ Patent disclosure also allows competitors to learn what inventions are already patented—or not—so they can adjust their strategy in creating new inventions rather than simply copying existing ones.⁶⁰ Patent disclosure helps limit the scope of patent claims⁶¹ by forcing the patentee to write down the exact claims they are making. This in turn prevents the patentee from claiming more than what is deserved.⁶² For example, when “the applicant has invented a four-legged chair [it] does not mean that she should necessarily receive the exclusive right to all chairs, no matter how many legs they have.”⁶³ Finally, disclosure “creates higher quality prior art.”⁶⁴ Patents themselves are prior art, and disclosure helps ensure that future inventors can easily determine if certain patents (as prior art) relate to their own inventions.⁶⁵

To properly disclose information, a patent must have a written description “in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.”⁶⁶ The description must also “set [out] the best mode contemplated by the inventor or joint inventor of carrying out the invention.”⁶⁷ Finally, the patent must have “one or more claims . . . pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.”⁶⁸

B. PATENT MARKING

Patent marking is another system that aids in the public disclosure requirement. Patent marking involves labelling commercialized products with their corresponding patent numbers in order to notify the public that the

58. Jeanne C. Fromer, *Dynamic Patent Disclosure*, 69 VAND. L. REV. 1715, 1717–18 (2016) (explaining the theoretical use of patent disclosure for the public).

59. See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1346–47 (Fed. Cir. 2010); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998); Fromer, *supra* note 58, at 1717–18.

60. See Fromer, *supra* note 58, at 1718; Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 549–50 (2009).

61. Jason Rantanen, *Patent Law's Disclosure Requirement*, 45 LOY. U. CHI. L.J. 369, 374 (2013).

62. *Id.*

63. *Id.*

64. *Id.* at 373.

65. *Id.* at 373–74.

66. 35 U.S.C. § 112(a) (2018).

67. *Id.*

68. *Id.* § 112(b).

products are patented.⁶⁹ At first, the American patent system featured no marking statute.⁷⁰ Patents were already in the public record, which was thought to be enough to put prospective patentees on constructive notice.⁷¹ But, to help further the goals of public disclosure and notice, the Patent Act of 1842 added the patent marking statute.⁷² The language of the statute remained mostly the same until 2011, when Congress amended the statute to require patentees to add physical markings to patented products.⁷³ Patentees now could not rely on constructive notice just by registering their patent.

Under the current marking system, the public can identify the patent in its commercialized form, whether competitor products are patented, and where to find the patent(s) in the public record—all of which help achieve: the underlying policy goals of public disclosure.⁷⁴ Ultimately, patent marking (1) discourages infringement; (2) aids the public in identifying whether an article is patented; and (3) encourages patentees to give constructive notice that an article is patented.⁷⁵

Constructive notice through patent marking is important because it maximizes the possible damages that a patentee may collect from an infringer. According to Section 287, “[i]n the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement” until the infringer is given actual notice of the infringement.⁷⁶ Often, actual notice takes the form of a cease and desist letter sent to the alleged infringer.⁷⁷ Still,

69. *Id.* § 287(a); see Corey McCaffrey, Comment, *The Virtues of Virtual Marking in Patent Reform*, 105 NW. U. L. REV. 367, 375–76 (2011); *id.* at 368 (“Patent marking is defined by the United States Patent Act as the act of physically labeling a product or its packaging with the identification numbers of patents that ostensibly protect the inventive ideas embodied in the product.”).

70. See McCaffrey, *supra* note 69, at 377 (“For decades, U.S. patent law did not contain any marking provisions, and patentees had no duty to mark products or give notice to potential infringers.”).

71. Christina Sharkey, Comment, *Strategic Assertions: Evading the Patent Marking Requirement*, 12 NW. J. TECH. & INTELL. PROP. 103, 105 (2014).

72. *Id.* at 105–06 (“Furthermore, notice is presumed when the patentee has marked in accordance with the statute.”).

73. 35 U.S.C. § 287(a) (“Patentees . . . may give notice to the public that the same is patented, either by fixing thereon the word ‘patent’ or the abbreviation ‘pat.’, together with the number of the patent In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter”).

74. See Fromer, *supra* note 58, at 1717.

75. See U.S. PAT. & TRADEMARK OFF., REPORT ON VIRTUAL MARKING 4–5 (2014), https://www.uspto.gov/sites/default/files/aia_implementation/VMreport.pdf [<https://perma.cc/D24K-MDNZ>].

76. 35 U.S.C. § 287(a).

77. James Yang, *What Are the Patent Marking Requirements and Its Benefits?*, OC PAT. LAW. (July 6, 2019), <https://ocpatentlawyer.com/patent-marking-requirements-benefits> [<https://perma.cc/HT9H-G4DA>] (“If you had to give actual notice, such as a cease and desist letter, to every alleged

the damages to a hypothetical lawsuit do not begin until the infringement is detected and the infringer receives the letter.⁷⁸ By marking, the patentees can claim all damages starting from the beginning of the infringement. As a result, patentees need not constantly scout the market to detect infringers if they mark their products.

Successful marking requires patentees to physically affix “patent” or “pat.” with the patent number to the product.⁷⁹ This requirement has several disadvantages, which includes when certain products may be covered by an unwieldy number of patents.⁸⁰ Trying to include every number on a product can be unrealistic, especially when the product (and its packaging) are too small.⁸¹

Generally, marking products may also provide a competitive advantage to patentees by giving the public the impression that the patentee’s products feature innovative properties.⁸² Congress prevents patentees who seek that competitive advantage without actually having a patent that covers their products. Under Title 35, Section 292 of the U.S. Code:

Whoever, without the consent of the patentee, marks upon, or affixes to, or uses in advertising in connection with anything made, used, offered for sale, or sold by such person within the United States, or imported by the person into the United States, the name or any imitation of the name of the patentee, the patent number, or the words “patent,” “patentee,” or the like, with the intent of counterfeiting or imitating the mark of the patentee, or of deceiving the public and inducing them to believe that the thing was made, offered for sale, sold, or imported into the United States by or with the consent of the patentee; or

Whoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word “patent” or any word or number importing that the same is patented, for the purpose of deceiving the public; or

infringer to impose liability of patent infringement, that notice might then be interpreted as a threat of litigation.”).

78. *See id.* (“The law allows those who are being threatened with litigation (i.e., alleged infringer), the option to be the first to go to court and ask the court to decide the rights and responsibilities between the parties.”); *see also* James W. Soong, *Patent Damage Strategies and the Enterprise License: Constructive Notice, Actual Notice, No Notice*, 4 DUKE L. & TECH. REV. ¶ 18 (2005) (“However, the notice letter is necessarily delayed at least until the infringement is detected, which often comes well after the onset of infringement.”).

79. 35 U.S.C. § 287(a).

80. U.S. PAT. & TRADEMARK OFF., *supra* note 75, at 5–6.

81. *Id.*

82. *See* Gaétan de Rassenfosse, *Notice Failure Revisited: Evidence on the Use of Virtual Patent Marking* 5 (Nat’l Bureau of Econ. Rsch., Working Paper No. 24288, 2018); Yang, *supra* note 77 (explaining the various competitive benefits and considerations behind marking products).

Whoever marks upon, or affixes to, or uses in advertising in connection with any article, the words “patent applied for,” “patent pending,” or any word importing that an application for patent has been made, when no application for patent has been made, or if made, is not pending, for the purpose of deceiving the public⁸³

Those who falsely mark with the intent to deceive may face a fine of \$500 per product that possesses the false marking. The fine can add up to huge judgments.⁸⁴ Before 2011, any private citizen could bring a civil action for the \$500 per product fine.⁸⁵ Civil suits could also involve expired patents.⁸⁶ This pressured patentees to remove markings as soon as their patents expired, or else risk liability. Unfortunately, removing patent markings is expensive because it involves changing the manufacturing process.⁸⁷

In 2011, Congress changed the false marking statute by prohibiting private citizens from bringing civil suits and disallowing suits against expired patents altogether.⁸⁸ The change helped cut costs for patentees who are no longer forced to spend the money to change their manufacturing process in order to unmark their products. Also in 2011, Congress added the ability to virtually mark products with a website:

Patentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented, either by fixing thereon the word “patent” or the abbreviation “pat.,” together with the number of the patent, or by fixing thereon the word “patent” or the abbreviation “pat.” *together with an address of a posting on the Internet, accessible to the public without charge for accessing the address, that associates the patented article with the number of the patent*⁸⁹

83. 35 U.S.C. § 292(a).

84. Still, courts have been willing to reduce the fine amount to be less than \$500. *See, e.g., King Tuna, Inc. v. Anova Food, Inc.*, No. CV07-07451, 2011 WL 839378, at *7 (C.D. Cal. Feb. 24, 2011).

85. 35 U.S.C. § 292(b) (2006) (“Any person may sue for the penalty, in which event one-half shall go to the person suing and the other to the use of the United States.”).

86. *See Pequinot v. Solo Cup Co.*, 608 F.3d 1356, 1361–62 (Fed. Cir. 2010) (holding that marking with expired patents can constitute a violation of the false marking statute).

87. *See Fasteners for Retail, Inc. v. Andersen*, No. 11 C 2164, 2011 WL 5130445, at *3–6 (N.D. Ill. Oct. 28, 2011) (accepting an argument that congressional legislative history indicated that Congress was concerned with the costs of removing expired patents from commerce or changing the manufacturing process to remove expired patents).

88. *See* 35 U.S.C. § 292(c) (2018) (“The marking of a product, in a manner described in subsection (a), with matter relating to a patent that covered that product but has expired is not a violation of this section.”).

89. *Id.* § 287(a) (emphasis added).

Now, instead of using a patent number, a patentee may use a weblink, that leads to a website which lists the patent(s) covering the product.⁹⁰ This marking option grants a host of advantages for patentees. For one, virtual marking eases the manufacturing process by allowing a weblink to replace a multitude of patent numbers.⁹¹ It erases the concern of having too many patents that might cover a single product, especially when the product is too small for multiple patent numbers. This also avoids ruining the aesthetic of a product by minimizing the applied text.⁹²

Additionally, virtual marking allows patentees to quickly update their websites with any changes to the patent, including when a patent expires.⁹³ Especially when a patentee mistakenly omits patent information or adds an inapplicable patent, a website allows the patentee to quickly fix those mistakes. On its own, this capability can greatly reduce the risk of being sued under Section 292.⁹⁴ Concurrently, virtual marking has led to a reduction of “predatory litigators” who simply tracked patent marking to determine if the patents had expired or if the patentee mistakenly marked their products.⁹⁵

C. PATENT SEARCHING

Before patentees can worry about marking, they must ensure that the USPTO accepts their patent application. Successful patent applications need a thorough “patentability search” to help ensure that the patent can withstand the patent prosecution process.⁹⁶ The search looks for various prior art, which can inform an applicant on the appropriate scopes of patent claims and the ultimate value of an approved patent to the applicant.⁹⁷ While prior art includes *anything* related to a patent, this Note is concerned with only the search for prior patents.

Over the past two decades, internet search technology as a whole has improved considerably,⁹⁸ which has included patent search technology.⁹⁹ Generally, patents are collected and organized relatively well compared to

90. *Id.*

91. See McCaffrey, *supra* note 69, at 376.

92. See Soong, *supra* note 78, ¶ 15.

93. See McCaffrey, *supra* note 69, at 369.

94. See Rassenfosse, *supra* note 82, at 6.

95. *Id.* (“This change significantly lowered the risk of being sued by eliminating ‘predatory litigators,’ composed of experienced litigation teams that systematically tracked false marking with a view of claiming damages.” (citation omitted)).

96. See PRACTICAL LAW, *supra* note 37.

97. *Id.*

98. See Lupu et al., *supra* note 8, at vi (“In the past 15 or 20 years, search technology in general and Web search engines in particular have made tremendous advances.”). See generally Frederic Baudour & Aalt van de Kuilen, *Evolution of the Patent Information World—Challenges of Yesterday, Today and Tomorrow*, 40 WORLD PAT. INFO. 4 (2015) (reviewing the recent advances in patent information searching technology).

99. Baudour & Kuilen, *supra* note 98, at 5.

other forms of prior art.¹⁰⁰ The uniformity of format is consistent through each document.¹⁰¹ Every patent includes “extensive bibliographic information, a title and abstract, a set of claims specifying the claimed scope of the invention,” and inventor and owner information.¹⁰² All this data is consolidated into metadata assignments so that the public can sort by certain types of information like year, inventor, and “classification.”¹⁰³

By “classification,” patent offices around the world organize patents “according to their technical application, structural features, intended use or the resulting product produced by a process.”¹⁰⁴ The United States uses the U.S. Patent Classification System (“USPC”), which assigns each patent with a class code followed by a hierarchy of subclass codes.¹⁰⁵ For example, class 62 is for refrigeration technologies, and subclass 3.63 holds refrigerator icemaker technology.¹⁰⁶ The USPTO creates new codes as needed when new technologies are patented.¹⁰⁷

For searching to be effective, documents must undergo optical character recognition (“OCR”), which scans patent documents to read their content so that electronic searches can detect them.¹⁰⁸ All patents today undergo OCR, but older patents that precede OCR technology are usually only scanned pictures without detectable fields.¹⁰⁹ Full-text searching is only guaranteed from 1976 and onward.¹¹⁰ Also, automatic OCR technology can still generate errors.¹¹¹

In terms of search platforms, patenting authorities like the USPTO offer free searching.¹¹² Still, these authorities only include patents within their jurisdiction.¹¹³ The USPTO’s search platform, which is called PatFT, is separately maintained from its EFS-Web system.¹¹⁴ Other free searching

100. Alberts et al., *supra* note 43, at 7–8.

101. *Id.*

102. *Id.* at 8, 23.

103. Dario Bonino, Alberto Ciaramella & Fulvio Corno, *Review of the State-of-the-Art in Patent Information and Forthcoming Evolutions in Intelligent Patent Informatics*, 32 WORLD PAT. INFO. 30, 31 (2010).

104. Alberts et al., *supra* note 43, at 16.

105. *Id.* at 16–17.

106. U.S. PAT. & TRADEMARK OFF., CLASS 62 REFRIGERATION 62-1 (2006), <https://www.uspto.gov/web/patents/classification/uspc062/schedo62.pdf> [<https://perma.cc/E8VS-XDWX>].

107. Alberts et al., *supra* note 43, at 17.

108. See Bonino et al., *supra* note 103, at 31.

109. *Id.*

110. See USPTO DATABASE, *supra* note 15.

111. Bonino et al., *supra* note 103, at 31.

112. Alberts et al., *supra* note 43, at 9; *Patent Full-Text Databases*, U.S. PAT. & TRADEMARK OFF., <http://patft.uspto.gov> [<https://perma.cc/6EYV-JCHC>] (last updated May 1, 2015).

113. Alberts et al., *supra* note 43, at 9.

114. See *Patent Full-Text Databases*, *supra* note 112.

platforms include Google Patents,¹¹⁵ The Lens: Patent Search,¹¹⁶ and FreePatentOnline.¹¹⁷ These platforms have their own pros and cons, including coverage of different databases, cost, and frequency of updates.¹¹⁸ Despite the wide availability of patent search platforms, “complete coverage of all patent documents . . . worldwide”—past and present—has not been achieved.¹¹⁹

No matter the search platform, any given patent search is only as good as the skill of the patent searcher. Patent searching experts leverage their skills by having an “[e]xhaustive usage of synonyms,” “[e]ffective use of Boolean operators, proximity operators and truncation operators [like and, or, around]” while “[c]ombining saved search queries,” among other skills.¹²⁰ Experts also prefer to use advanced functionalities that feature more freedom and control over search parameters.¹²¹ Inexperienced searchers, however, prefer “simpler commands, with complexity hidden under a simplified front-end.”¹²² Nonetheless, to ensure that an inventor is maximizing their search results, many inventors hire patent search experts for a fee. The fee can range anywhere between \$100 to \$3,000 depending on the invention and searching expertise.¹²³

Different patent searches have different objectives, including: (1) “state-of-the-art search,” which provides a review of the “of advancements in a certain” field or technology;¹²⁴ (2) validity search, which “determine[s] if a patent already granted for an invention is valid” and “measure[s] . . . the strength of a patent” by going through older patents;¹²⁵ (3) “freedom-to-operate search,” which ensures “that one does not infringe upon . . . [an active] patent;”¹²⁶ and (4) patentability search, which determines how all relevant prior art impacts the likelihood of a patent application’s success.¹²⁷

115. GOOGLE PATENTS, <https://patents.google.com> [<https://perma.cc/B2WK-ZU9A>].

116. *New Patent Search*, LENS.ORG, <https://www.lens.org/lens/new-search?type=PATENT> [<https://perma.cc/4B55-S9VG>].

117. *Search*, FREE PATENTS ONLINE, <http://www.freepatentsonline.com/search.html> [<https://perma.cc/5J4B-S5HY>].

118. Alberts et al., *supra* note 43, at 9.

119. WORLD INTELL. PROP. ORG., WIPO GUIDE TO USING PATENT INFORMATION 11 (2015), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1434_3.pdf [<https://perma.cc/EW6V-JFB8>].

120. Alberts et al., *supra* note 43, at 22.

121. Bonino et al., *supra* note 103, at 34.

122. *Id.*

123. *Patent Search Cost: Everything You Need to Know*, UPCOUNSEL (July 13, 2020), <https://www.upcounsel.com/patent-search-cost> [<https://perma.cc/8WDY-YV6L>].

124. *Id.*; see also Magdy et al., *supra* note 43, at 725 (“Relevant [search returns] . . . include patents that can invalidate the novelty of the invention . . .”).

125. Alberts et al., *supra* note 43, at 13.

126. *Id.*

127. *Id.* at 12.

Successful Patent searchers are aware of the issues surrounding the complexity of research on corporate entities, inventors, and other patentees. As this Note will explain, patent ownership can change without notice to the USPTO.¹²⁸ Company subsidiaries change frequently, and individual business units are bought and sold regularly. Further, searching only for a parent company name may not necessarily capture all company subsidiaries. Other problems include:

[1] Company suffixes (e.g. Co., Inc.) vary wildly and must be accounted for[;]

[2] Inventor names are commonly spelled in a wide variety of fashions, with and without suffixes, with or without initials, or completely misspelt altogether[;]

[3] Patents are very often not printed with assignment data upon issuance such that the owner files assignment data after printing[; and]

[4] Correspondence address information can sometimes be used to approximate the ownership of patents.¹²⁹

III. THE PROBLEM WITH THE CURRENT NOTICE SYSTEM

Congress and the USPTO have done an admirable job of keeping the patent system up to date with the internet age. Despite that, there are some outstanding issues that need to be addressed including disclosure, marking, and innocent infringement.

A. PATENT DISCLOSURE PROBLEMS

Patent disclosure requirements only apply to the initial filing of the patent.¹³⁰ There is no obligation to disclose after the initial filing.¹³¹ As a result, any improvements or changes to the patent claims are unlikely to be recorded after the initial filing. Not only do scholars debate whether the current statutory obligation is substantively effective,¹³² but they also wonder whether the law should demand further disclosure after the initial filing.¹³³ It does not help that the American patent system now gives priority to patentees

128. See *infra* Section III.A.

129. Alberts et al., *supra* note 43, at 25.

130. See 35 U.S.C. § 112 (2018); Fromer, *supra* note 58, at 1720 (“Given that patenting tends to happen very early on, it is often only much later that a patented invention makes its way to the marketplace.”).

131. See Fromer, *supra* note 58, at 1716, 1720.

132. See, e.g., Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 545, 567–70 (2012); Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 U. COLO. L. REV. 467, 485–87 (2008); Seymore, *supra* note 14, at 657–69.

133. See Fromer, *supra* note 58, at 1720–22.

who file their inventions first (as opposed to first-to-invent).¹³⁴ The first-to-file system implicitly incentivizes inventors to file as soon as possible.¹³⁵ Often, patentees who rush to file will only disclose the bare minimum required by the statutory rules, at the cost of effective public disclosure.¹³⁶

One argument for a continuing obligation to disclose after initial filing involves informing the public of additional innovation towards a patent's commercialization.¹³⁷ As part of their monopoly, patentees often use their patents for their products on the market to give them a competitive advantage. But orienting the contents of a patent to viable commercialization is a whole new process that involves further innovation.¹³⁸ Patentees often refine their inventions, allowing any changes to happen throughout the prototype, manufacturing, and marketing stages.¹³⁹ Unfortunately, without a continuing obligation to disclose, any and all innovation towards commercialization usually is not disclosed. This disclosure would theoretically further the goal of improving public knowledge of useful innovations.

Another major issue of patent disclosure is the fact that patentees do not have to update their patents if they assign their patents to a third party.¹⁴⁰ Currently, patentees can assign their interests without recording the transaction to the USPTO unless the parties want to protect "against any subsequent purchaser or mortgagee for a valuable consideration, without notice."¹⁴¹ As a result, unless the assignee sells or mortgages the patent to a third party, the assignee has no incentive to record the assignment to the USPTO. This prevents the public from gaining adequate notice on who may actually own a patent.

Still, requiring more disclosure obviously costs patentees more money to complete their patent applications.¹⁴² The increased cost would deter patenting activity, which is already an expensive endeavor.¹⁴³ The cost involved, for instance, may include an attempt to match all the possible

134. See *id.* at 1720; David S. Abrams & R. Polk Wagner, *Poisoning the Next Apple? The America Invents Act and Individual Inventors*, 65 STAN. L. REV. 517, 528–30 (2013).

135. See Fromer, *supra* note 58, at 1720.

136. See *id.* at 1720–21.

137. See *id.* at 1722–24 (proposing a continuing obligation to disclose would benefit the public by sharing commercialization information).

138. See *id.* at 1720.

139. See *id.* at 1720–21.

140. See 35 U.S.C. § 261 (2018) (updating ownership is required only if the assignee seeks protections against claims from subsequent purchasers and mortgagees).

141. *Id.*

142. See Fromer, *supra* note 58, at 1722.

143. See J.D. Houvener, *How Much Does a Patent Cost?*, BOLD PATS. (Jan. 16, 2019), <https://boldip.com/blog/patent-cost> [<https://perma.cc/5QNK-53TT>].

patents to a single product.¹⁴⁴ Some products may be covered by a multitude of patents and trying to narrow down every patent can be challenging, especially for entities with extensive patent portfolios.¹⁴⁵

B. PATENT MARKING PROBLEMS

Section 287 does not technically require patentees to mark.¹⁴⁶ So when a patentee fails to mark or give actual notice, the public has free reign to reproduce the products they see on the market.¹⁴⁷ Even though patents are in the public record, the courts have allowed the public to mistakenly infringe on patents when products are commercialized without marking.¹⁴⁸ The Court has even called the act of distributing unmarked products “decepti[ve].”¹⁴⁹ The argument goes that patentees might intentionally distribute unmarked products and pursue legal recourse against infringers who were actually innocent in their intentions. Ultimately, if patentees produce products with patent coverage, they need to mark them if they want to collect the maximum amount of damages.

The marking requirement, however, does not apply when: (1) the patentee is not producing products that use the patent;¹⁵⁰ and (2) the patent encompasses a “method.”¹⁵¹ A method “relate[s] to the performance of particular steps” to achieve a result.¹⁵² An example of a method is a manufacturing process.¹⁵³ Specifically, a pharmaceutical company can patent how they make a drug ranging from the compounds, their amounts, and how to synthesize the compounds.¹⁵⁴ In either scenario, failing to mark does not prevent the collection of damages. As an example of notice failure under the existing system, the loophole allows holders of a method patent to collect on

144. McCaffrey, *supra* note 69, at 369, 375–76 (“The major advantage of virtual marking is that it untangles marking from the manufacturing process. Physical marking is expensive, inflexible, and increasingly inapplicable . . .”).

145. See Rassenfosse, *supra* note 82, at 12.

146. See 35 U.S.C. § 287(a) (2018).

147. See *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162–63 (1989) (advancing the policy behind patent marking, which is to “limit[] the ability of the public to exploit an otherwise unprotected idea”).

148. See *Wine Ry. Appliance Co. v. Enter. Ry. Equip. Co.*, 297 U.S. 387, 398 (1936) (“Under the interpretation which we accept, [the patent marking statute] . . . provides protection against deception by unmarked patented articles, and requires nothing unreasonable of patentees.”).

149. *Id.*

150. *Id.* at 395 (holding that Congress did not intend to encompass “process patents and patents under which nothing has been manufactured”).

151. *Patent Marking*, FENWICK (Sept. 3, 2018), <https://www.fenwick.com/insights/publications/patent-marking> [<https://perma.cc/H6PT-XC96>]; see *Wine Ry. Appliance Co.*, 297 U.S. at 395.

152. Timothy R. Holbrook, *Method Patent Exceptionalism*, 102 IOWA L. REV. 1001, 1003 (2017).

153. See generally *id.* (describing different processes that are able to be patented).

154. See *id.* at 1005 & n.6.

damages for manufacturing processes even when the infringer had no prior notice of the patent.¹⁵⁵

There are some types of products that make it hard to mark, such as software and nanotechnology. Software products present a unique challenge in that users are only licensees, not owners of the software.¹⁵⁶ Even so, in the past, patentees sold software physically on a CD or another storage medium.¹⁵⁷ But nowadays, software predominantly possesses no physical form because consumers—or licensees—can simply download software through the internet.¹⁵⁸ In response to this change, patentees may mark their software on the user interface of the software, such as on the launch screen.¹⁵⁹ Marking can also take place in a supplemental folder (e.g., a drop box) with other legal information when downloading software.¹⁶⁰ Marking through this method, however, becomes problematic when software is directly shipped from the patentee to the licensee, like through shipping a new desktop computer that contains software that cannot be found in any other way.¹⁶¹ In situations like this, non-licensees may find it difficult to receive notice of the software when they cannot see the marking through any other means.¹⁶² Supplemental “marking [also] does not help [non-licensees] prevent innocent infringement” in these sorts of scenarios.¹⁶³ As a result, the chances of innocent infringement increases, lowering the value of marking for patentees.¹⁶⁴

The law is also currently unclear on how patentees *should* mark their software.¹⁶⁵ Although Section 287(a) technically allows for marking on a product’s packaging when marking on the actual product cannot be done, case law has refused to allow marking to be done on CD labels or other places when those places contain other printings, such as company name and copyright notice.¹⁶⁶ Combine this legal risk with the minimal benefits of software marking, and patentees have less incentive to mark their products. It

155. See Sharkey, *supra* note 71, at 104.

156. Soong, *supra* note 78, ¶¶ 26–27, 27 n.67 (explaining that patentees of software only give the right to use software, as opposed to owning the software, which would imply the ability to re-sell and reverse engineer).

157. See *id.* ¶ 8.

158. See *id.*

159. See *id.*

160. See *id.*

161. See *id.* ¶ 9.

162. Roger D. Blair & Thomas F. Cotter, *Strict Liability and Its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799, 812–21 (2002) (explaining the totality of the circumstances that lead to manufacturers who avoid marking).

163. Soong, *supra* note 78, ¶ 9.

164. *Id.* Logically, if patent marking in software is not effective at preventing infringement, then the value of patent marking decreases.

165. See *id.* ¶¶ 12–14.

166. See *id.* ¶¶ 8, 12; see also Rutherford v. Trim-Tex, Inc., 803 F. Supp. 158, 162–64 (N.D. Ill. 1992) (balancing public policy of what should consider compliance with the marking statute, between marking on packages and marking on the product).

is unclear if marking software by launch screen or supplemental folder is legally sufficient to put the public on constructive notice. Alternatively, even if marking is successful, the effect of deterring innocent infringers is minimal.¹⁶⁷ In addition, physically marking software can harm the product's aesthetic because legal notices create an appearance of complexity, which may deter users who seek "simplicity and user friendliness."¹⁶⁸ Similarly, the costs of acquiring a large number of patents to sufficiently cover their product may further discourage inventors from even applying for patents, much less marking.¹⁶⁹

Another reason a patentee may avoid proper marking is the risk of violating the false marking statute.¹⁷⁰ While Congress recently lessened the legal risk of falsely marking by eliminating most private suits and claims against expired patents, the danger still exists for accidentally marking a product with a patent.¹⁷¹ Especially when a multitude of patents could cover a product, a mistake in any one of the patents could cost a patentee a great deal of money in fines.¹⁷²

Even though Congress lightened the burden of marking by introducing virtual marking, marking is still not perfect. Some issues include requiring an internet connection for the public to access.¹⁷³ Internet access may not be freely accessible to everyone.¹⁷⁴ For example, internet access may be limited, or altogether absent in geographically isolated areas.¹⁷⁵ In addition, the virtual marking, as it stands now, needs the patentee to maintain the website.¹⁷⁶ A patentee can suddenly intentionally or accidentally cut access to their website, whether permanently or temporarily; undercutting the effectiveness of the virtual mark.¹⁷⁷ While there is a general lack of empirical data on the costs of creating and maintaining a website for patent marking, the USPTO vaguely estimated that patentees could pay up to tens of thousands of dollars to create

167. See Soong, *supra* note 78, ¶¶ 9–10.

168. See *id.* ¶ 15. ("The sheer length of marking verbiage may detrimentally impact product aesthetics, perhaps an important marketing consideration. Legal notices may add to apparent product complexity, the hallmark of a doomed offering in an industry increasingly committed to simplicity and user friendliness.")

169. See Neel U. Sukhatme, *Regulatory Monopoly and Differential Pricing in the Market for Patents*, 71 WASH. & LEE L. REV. 1855, 1877–86 (2014) (discussing the expensive and inflexible prices of patents).

170. See *supra* Section II.B.

171. See *supra* Section II.B.

172. See *supra* Section II.B.

173. See U.S. PAT. & TRADEMARK OFF., *supra* note 75, at 13–14 ("While the only way for the general public to access patent numbers for a virtually marked article is by way of the Internet, the lack of Internet availability may be a barrier to public access to the patent information." (footnote omitted)).

174. See *id.* at 14.

175. See *id.*

176. See *id.* at 9.

177. See *id.* at 13–14.

the website and then pay monthly operating costs.¹⁷⁸ The costs and other factors may convince patentees to briefly stop maintaining the website or stop hosting the website entirely. As a result, there is no guarantee that the public can actually access patent information from the patentee through virtual marking.

Another concern for the public, specific to virtual marking, is privacy. Section 287 merely requires that the public can access the website without charge.¹⁷⁹ Nothing in the statute prevents patentees from maintaining a patent website that tracks user activity.¹⁸⁰ Patentees could require visitors to submit personal information—such as names, emails, phone numbers, and addresses¹⁸¹—for their commercialized and competitive use and to monitor whether competitors are accessing the site.¹⁸²

In addition, there is no uniformity in how these virtual marking websites are organized.¹⁸³ The statute offers no rules or guidance on how websites should present patent information.¹⁸⁴ In its report on virtual marking, the USPTO reviewed patent webpages.¹⁸⁵ In its survey, it found the different ways that websites organized patent information. None of the web pages listed only a single model or product, and the web pages adopted a wide variety of approaches in how they listed products and patents.¹⁸⁶ The methods included:

- [1] Listing each product's model identifier and the patents associated with that model identifier;
- [2] Listing only the patent numbers, without any model identifier;
- [3] Listing different product types with their associated patent numbers;
- [4] Listing the patent numbers with the associated Universal Product Code (UPC) of the product;
- [5] Listing the patent numbers and hyperlinks to PDF documents of the patents associated with the product; and
- [6] Listing the patent numbers according to any of the above configurations, with or without information indicating when the listing was last updated.¹⁸⁷

178. *See id.* at 10–11.

179. *See* 35 U.S.C. § 287(a) (2018).

180. *See id.*

181. *Id.*

182. *Id.*

183. *See* U.S. PAT. & TRADEMARK OFF., *supra* note 75, at 21–23.

184. *See* 35 U.S.C. § 287(a).

185. *See* U.S. PAT. & TRADEMARK OFF., *supra* note 75, at 22–23.

186. *Id.*

187. *See id.* at 22.

This lack of uniformity among patentees' websites makes it very difficult for members of the public to find the information they seek.

Some websites, as a result, are also inconsistent in how user-friendly they are. Some people could navigate these websites well, but ideally, the websites should be as user-friendly as possible to accommodate people inexperienced with online technology. Still, virtual marking is relatively new, and the statute only requires the website to "associate" the patent to the product.¹⁸⁸ However, although the term "associate" has been recently refined by the courts, its exact requirements have not yet been fully delineated.

In *Manufacturing Resources International, Inc. v. Civiq Smartscales, LLC*, for instance, the District Court of Delaware granted summary judgment against a patentee's virtual marking scheme.¹⁸⁹ The scheme involved a marking that led to a website that "list[ed] all patents that could possibly apply to a product or all patents owned by the patentee."¹⁹⁰ The court held that the website does not sufficiently "associate" the marked product with its patents.¹⁹¹ Simply listing patents and indicating that those patents *may* cover a product is not enough.¹⁹² The court avoided recommending any specific means of providing an appropriate level of "association."¹⁹³ It only cited a case that marking should "provide[] a ready means of discerning the status of the intellectual property embodied in an article of manufacture or design."¹⁹⁴

The general lack of legal guidance on website organization is a logical reason why patentees avoid virtual marking.¹⁹⁵ In addition, lack of awareness of virtual marking may contribute to low levels of patentee users.¹⁹⁶ The USPTO noted in its report "that virtual marking is not widely used."¹⁹⁷ The USPTO mentioned that this could be an opportunity "to educate the public on . . . virtual marking and [its] advantages." However, the USPTO has not taken any extensive effort to do so.¹⁹⁸

Recently in February 2018, the National Bureau of Economic Research conducted an empirical study "suggest[ing] that about 12 percent of patent holders overall provide virtual marking information."¹⁹⁹ The study randomly drew 200 patent owners who had "at least one active patent on January 1st,

188. *Id.* at 22–23.

189. *Mfg. Res. Int'l, Inc. v. Civiq Smartscales, LLC*, 397 F. Supp. 3d 560, 571 (D. Del. 2019).

190. *Id.* at 577.

191. *Id.* at 578.

192. *Id.* at 577.

193. *Id.* at 578.

194. *Id.* at 577 (quoting *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162 (1989)).

195. See U.S. PAT. & TRADEMARK OFF., *supra* note 75, at 2–3.

196. *Id.* at 23.

197. *Id.*

198. *Id.*

199. Rassenfosse, *supra* note 82, at 1.

2017.”²⁰⁰ Of the patent owners, only 12 percent used virtual marking.²⁰¹ The study extrapolated the data to 150,000 unique patent owners, which indicated that about 18,000 of them provided virtual marking.²⁰² But “this figure is likely to be an inflated estimate,” so the study estimated that a figure between 5,000 to 10,000 would be more appropriate.²⁰³

Patents can already fail to give proper notice to the public, whether by being too vague²⁰⁴ or failing to indicate who actually owns the patent.²⁰⁵ Only 12 percent (at most) of patent owners provide virtual marking information, possibly suggesting a high-rate notice failure.²⁰⁶ Naturally, the failure to notify directly leads to “innocent infringement,” which is when the infringer is unaware that they have actually infringed upon a patent.²⁰⁷

C. INNOCENT INFRINGEMENT

Beyond the outstanding issues of disclosure and marking, innocent infringement itself may lead to drastic legal consequences due to the minimal state of mind required for a patent infringement suits. Patent infringement claims notably require only strict liability.²⁰⁸ This means that intent and state of mind are irrelevant.²⁰⁹ Courts look only to whether the alleged infringement falls within the scope of the patent.²¹⁰ Even though the infringer independently developed a technology without copying any patents, the infringer can still be found liable.²¹¹ Although strict liability simplifies infringement claims by avoiding the need to look at intent, the problem of “innocent infringement” arises.²¹² In fact, data indicate that the vast majority of patent infringement actions involve innocent infringement.²¹³ Part of the problem is inherent to intangible property as a whole.²¹⁴ Patents, similar to

200. *Id.* at 3.

201. *Id.*

202. *Id.* at 9.

203. *Id.*

204. *See supra* Section III.A; *see also supra* Section II.C (discussing the issues that arise during patent searches).

205. *See supra* Section III.A.

206. Rassenfossé, *supra* note 82, at 2–3, 16–18 (discussing notice failure and suggesting how virtual marking could reduce notice failure if improvements are made).

207. *See infra* Section III.C.

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

209. *Id.* at 1423.

210. *Id.* at 1423–25.

211. *Id.*

212. *Id.* at 1425.

213. *Id.* at 1451, 1458 tbl.4.

214. Patrick R. Goold, *Patent Accidents: Questioning Strict Liability in Patent Law*, 95 IND. L.J. 1075, 1087–90 (2020).

other intellectual property, face difficulties in attempting to describe inventions with words.²¹⁵

Patent owners called “patent assertion entities” (“PAEs”) often sue unsuspecting infringers for large judgments under strict liability.²¹⁶ PAEs do not produce any products, which excuses them from the patent marking duty.²¹⁷ Their primary source of income is licensing their patents to third parties.²¹⁸ But court judgments from infringement actions may provide for another source of income.²¹⁹ PAEs often wait several years before asserting an infringement suit.²²⁰ Waiting “allows [the] damages to accrue,” incentivizing PAEs to wait for more profitable litigation.²²¹ The societal costs of these judgments add up and can disincentivize inventors from innovating.²²² When faced with the risk of infringement suits, inventors often dedicate more time and money conducting patent searches.²²³ And even when inventors find relevant patents and believe they are operating outside the scope of these patents, they still can be found liable under strict liability.²²⁴ The innocent infringement problem worsens when patentees may want to draft their patent claims to be as broad as possible by using words to cover both their invention and more.²²⁵ By using broad language, patentees can increase the likelihood that their patents cover competitor technology.²²⁶

The problem of innocent infringement is exacerbated when the patent regime depends strongly on the current iteration of constructive notice. There needs to be improvement to the patent disclosure and marking systems to help prevent innocent infringement. One solution may be to abandon strict liability in favor of a more forgiving framework.²²⁷ Discussion on the merits of strict liability, however, goes beyond the scope of this Note.

215. *Id.*

216. Matthew K. Blackburn, *Address Abusive Patent Litigation by Reducing Innocent Infringement*, LANDSLIDE, July–Aug. 2014, at 38, 39.

217. Goold, *supra* note 214, at 1121.

218. *Id.*

219. Blackburn, *supra* note 216, at 39.

220. *Id.*

221. *Id.*

222. *Id.* at 40.

223. *Id.* (explaining how defending against PAE suits presents risks, increases prices charged to consumers, and takes away funds from research and development).

224. Goold, *supra* note 214, at 1085–86.

225. *See id.* at 1089.

226. *Id.* at 1090.

227. *See generally* Blair & Cotter, *supra* note 162 (arguing that the patent law regime is a modified form of strict liability); Jason A. Rantanen, *An Objective View of Fault in Patent Infringement*, 60 AM. U. L. REV. 1575 (2011) (arguing that the fault element is assessed in cases of infringement ought to be reassessed with a contemporary view of patent infringement).

IV. PROPOSAL: A UNIFIED PATENT-PRODUCT DATABASE BASED ON THE “ORANGE BOOK”

A solution that would help resolve the issues of the patent notice system could be modelled after a drug patent database called the “Orange Book.” This Note will discuss what the Orange Book is. Then it will apply the ideas of Orange Book to the USPTO’s patent database.

A. THE ORANGE BOOK

The patent system could benefit from borrowing the ideas found in the pharmaceuticals industry. In addition to the current patent regime, the pharmaceutical industry deals with heavy regulation under the purview of the Federal Drug Administration (“FDA”).²²⁸ The FDA ensures that pharmaceuticals undergo an appropriate level of scrutiny before entering the market.²²⁹ Complying with the FDA’s regulation requires drug companies to invest more money beyond creating drugs.²³⁰ The FDA ensures that “all new prescription drugs . . . [are] safe and effective for their intended use prior to marketing.”²³¹ During this process, new brand-name drugs must undergo extensive clinical testing and risk management analysis.²³² The FDA allows some non-approved drugs only under specific circumstances, such as an “insufficient supply of an FDA-approved drug.”²³³ The FDA reviews over-the-counter drugs separately with the Office of Drug Evaluation IV.²³⁴

To offset the costs of undergoing FDA review, the pharmaceutical industry depends on the patent system to gain exclusivity to market brand-

228. See Amanda Fachler, Note, *The Need for Reform in Pharmaceutical Protection: The Inapplicability of the Patent System to the Pharmaceutical Industry and the Recommendation of a Shift Towards Regulatory Exclusivities*, 24 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 1059, 1062 (2014). See generally Rebecca S. Eisenberg, *The Role of the FDA in Innovation Policy*, 13 *MICH. TELECOMMS. & TECH. L. REV.* 345 (2007) (reassessing the role of the FDA and reconsidering the agency’s regulatory functions).

229. See *What We Do*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/about-fda/what-we-do> [<https://perma.cc/7CBL-9S4S>] (last updated Mar. 28, 2018); *Development & Approval Process | Drugs*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/development-approval-process-drugs> [<https://perma.cc/D4RD-DWYS>] (last updated Oct. 28, 2019); *When and Why Was FDA Formed?*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/about-fda/fda-basics/when-and-why-was-fda-formed> [<https://perma.cc/KZL3-35BJ>] (last updated Mar. 28, 2018).

230. Eisenberg, *supra* note 228, at 349–50.

231. *Unapproved Drugs*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/enforcement-activities-fda/unapproved-drugs> [<https://perma.cc/2S6Z-ZTDV>] (last updated Feb. 17, 2021).

232. Eisenberg, *supra* note 228, at 353–54; *Development & Approval Process | Drugs*, *supra* note 229.

233. *Unapproved Drugs*, *supra* note 231.

234. *Over-the-Counter OTC | Nonprescription Drugs*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/how-drugs-are-developed-and-approved/over-counter-otc-nonprescription-drugs> [<https://perma.cc/FTX3-MCXL>] (last updated May 7, 2020).

name drugs.²³⁵ The system allows drug companies to maintain a profitable enterprise despite heavy FDA regulation.²³⁶ But after a patent expires, other drug companies can create generic versions of the brand-name drug upon FDA approval.²³⁷ With new generic drugs on the market, the competitive advantage enjoyed by brand-name drugs dissipates, and the price drops.²³⁸ The intersection of the patent system and the pharmaceutical industry thus presents an interesting balance between costs, risks, and rewards for drug companies.

Under the Drug Price Competition and Patent Term Restoration Act of 1984, one of the FDA's mandates is to publish a list of approved drugs for public access.²³⁹ The list is called, "Approved Drug Products with Therapeutic Equivalence Evaluations" or more commonly known as the "Orange Book."²⁴⁰ The Orange Book is published each year on the FDA's website in printable PDF form.²⁴¹ The Orange Book includes different types of drugs, including prescription drugs, over-the-counter drugs, and discontinued products.²⁴² The Book also includes related patent exclusivity information in its Addendum.²⁴³ Date information accompanies each entry in the Orange Book, detailing when the drug was approved and how long the drug's period of patent exclusivity lasts.²⁴⁴

235. Eisenberg, *supra* note 228, at 350–52.

236. *See id.*

237. *Id.* at 357–58.

238. *Id.*

239. CTR. FOR DRUG EVALUATION & RSCH., U.S. DEP'T OF HEALTH & HUM. SERVS., MARKETING STATUS NOTIFICATIONS UNDER SECTION 506I OF THE FEDERAL FOOD, DRUG, AND COSMETIC ACT; CONTENT AND FORMAT: GUIDANCE FOR INDUSTRY 1 (2020), <https://www.fda.gov/media/120095/download> [<https://perma.cc/38DH-8ZXE>].

240. *Id.*; *Approved Drug Products with Therapeutic Equivalence Evaluations | Orange Book*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/drug-approvals-and-databases/approved-drug-products-therapeutic-equivalence-evaluations-orange-book> [<https://perma.cc/XU35-XF4G>] (last updated Feb. 12, 2021); *see also* Jennifer Gershman, 4 *Interesting Facts About the Orange Book*, PHARMACY TIMES (Mar. 13, 2018, 1:41 PM), <https://www.pharmacytimes.com/contributor/jennifer-gershman-pharmd-cph/2018/03/4-interesting-facts-about-the-orange-book> [<https://perma.cc/H4HH-5EQG>] (reporting that the name, "Orange Book," comes from when the database was first published in "October 1980, and the color orange was selected since it was almost Halloween").

241. *Frequently Asked Questions on the Orange Book*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/drug-approvals-and-databases/frequently-asked-questions-orange-book> [<https://perma.cc/2XGC-RXLN>] (last updated Feb. 5, 2020).

242. CTR. FOR DRUG EVALUATION & RSCH., *supra* note 239, at 2.

243. *Orange Book Preface*, U.S. FOOD & DRUG ADMIN., <https://www.fda.gov/drugs/development-approval-process-drugs/orange-book-preface> [<https://perma.cc/H53A-S7V8>] (last updated Jan. 21, 2021).

244. U.S. DEP'T OF HEALTH & HUM. SERVS., APPROVED DRUG PRODUCTS WITH THERAPEUTIC EQUIVALENCE EVALUATIONS 2-1 to 2-2, 2-3 *illus.2.2* (41st ed. 2021), <https://www.fda.gov/media/71474/download> [<https://perma.cc/ZW2V-5WUU>].

In addition to publishing a PDF form, the FDA maintains the Orange Book on an online database.²⁴⁵ The FDA updates the database daily,²⁴⁶ and the public can easily search all listed drugs in the Orange Book. Searching is available through various fields, such as active ingredient, FDA application number, applicant company, dosage form, patent number, and route of administration.²⁴⁷ The database's ease of use allows drug companies to quickly search whether a drug is patented and when the patent exclusivity period ends. This helps prevent drug companies from spending too much money and time developing drugs that already enjoy patent protection. The database also allows drug companies to know when patent exclusivity ends, thereby allowing them to plan production of generic drugs. When producing generic drugs, drug companies must file a certification statement indicating that patent exclusivity does not exist for the drug.²⁴⁸ Overall, the database is instrumental for market research by drug companies.

B. PROPOSAL: UNIFIED PATENT-PRODUCT DATABASE ADOPTION

This Note proposes the USPTO adopt and oversee the subsequent management of a unified patent-product database that tracks when patents are used for commercialized products. The database would accomplish this by removing the duty to mark and replacing it with the duty to electronically update patents with product information. This means that patentees must update their patents on the EFS-Web system if they want to constructively notify the public of their patents. Only when the patentee can prove that they updated their patents will the courts allow damages against an infringer to start accruing. The duty in this framework falls on the patentee to fulfill, whether they are the original patent owner or a subsequent assignee. Whether or not the duty to update should extend to process patents, patents for purposes of licensing, or idle patents is a discussion beyond the scope of this Note.

The database should maintain the current PatFT search system but add an index organizing patents by the patentees and assignees who use those patents for products. While there could be multiple subsidiary entities owned under a parent company, the public should be able to do the appropriate market research to account for these entities in its own search. Ultimately, the public should easily search for entities like Apple, and the search results would list Apple's products with accompanying patent information. The search engine should also sort different types of data into metadata to allow for flexible searching, such as organizing by product types (similar to the USPC

245. *Orange Book: Approved Drug Products with Therapeutic Equivalence Evaluations*, U.S. FOOD & DRUG ADMIN. [hereinafter *Orange Book Database*], <https://www.accessdata.fda.gov/scripts/cder/ob/index.cfm> [<https://perma.cc/2JDL-RK5U>].

246. *Frequently Asked Questions on the Orange Book*, *supra* note 241.

247. *Orange Book Database*, *supra* note 245.

248. *See Orange Book Preface*, *supra* note 243.

classification system of patents) instead of organizing by patentee names. Essentially, this unified database should mirror the Orange Book's approach.

More concretely, the PatFT home page²⁴⁹ could include another column that says, "PatFT: Commercialized Patents." Under this column, it would list similar search options found on the Orange Book's search page.²⁵⁰ The following list is an example of how the current search fields of the Orange Book search page could be matched to the PatFT home page: (1) the Orange Book's "Proprietary Name, Active Ingredient or Application Number" search field would turn into two different fields on PatFT: "Patent Number" and "Product Name;" (2) the "Applicant (Company)" would turn into "Patentee (Applicant, Assignee or Licensee);" (3) "Dosage Form" would turn into "Classification Class;" and (4) "Route of Administration" would turn into "General Full-Text Search." There are many more possible search fields that could be used like "Inventor," "Patent Name," "Application Number," and "Filing Date."²⁵¹

When the public uses one of the search functions, a chart similar to the one found on the Orange Book²⁵² would show up. The chart would list all relevant information including product name, patentee, classification class, patent term and expiration dates, and patent number. From there, the user could click on the patentee and browse its other products that are under patent protection. On the chart, there could also be a column dedicated to listing a website belonging to the patentee that gives more product information or allows the public to purchase the product. Overall, this process would make patent searching a much easier endeavor, and inventors do not need to learn complicated search functions.

To illustrate this proposal, an example of a patentee that could have benefitted is 3M Company ("3M") with its "Post-it Note" product.²⁵³ The name of the patent is "Repositionable Pressure-Sensitive Adhesive Sheet Material," and its patent number is 5,194,299.²⁵⁴ The classification class is 427/208.6 and the assignee is 3M's official name, "Minnesota Mining and Manufacturing Company."²⁵⁵ Under this proposal, 3M would not have to mark each of its Post-it Notes with its unwieldy patent number. Instead, 3M would file a document with the USPTO that associates its patent with the Post-it Note. It

249. *Patent Full-Text Databases*, *supra* note 112.

250. *Orange Book Database*, *supra* note 245.

251. For a description of the Orange Book in its current form, see *supra* text accompanying notes 245-47.

252. For an example of a chart, see *Orange Book Database*, *supra* note 245 (search "Meperidine Hydrochloride" under the "Search by Proprietary Name, Active Ingredient or Application Number" option).

253. For more information on the Post-it Note, see *History Timeline: Post-it® Notes*, POST-IT BRAND, https://www.post-it.com/3M/en_US/post-it/contact-us/about-us [<https://perma.cc/2EHW-SWLS>].

254. U.S. Patent No. 5,194,299 (filed Mar. 16, 1993).

255. *See id.*

would fill in all relevant information including the product name (“Post-it Note”), the assignee (“Minnesota Mining and Manufacturing Company”), and the patent number (“5,194,299”). Once this is done, 3M would have fulfilled its duty to constructively notify the public of its patent. It would be up to the public to use the patent-product database to look up the product and its patent information. There would be no need for 3M to spend the time and money to mark each of its Post-it Notes or maintain a website with its patent information. In turn, the public would not be at the mercy of 3M if it ever decided to change the way it marked its products.²⁵⁶ The patent-product database would ultimately allow for a consistent searching experience.

C. BENEFITS AND POLICY ARGUMENTS

This unified database product-patent proposal involves a number of foreseeable benefits and is rooted in sound public policy. Overall, the proposal seeks to minimize innocent infringement and reduce societal costs of infringement suits while providing improved public accessibility and engagement compared with traditional product marking. Additionally, this proposal acknowledges that while virtual marking was a step in the right direction in regard to these baseline public policies, its narrow use and considerable detriments has shown virtual marking to be an insufficient solution.²⁵⁷

Removing the duty to mark and replacing it with the duty to electronically update patents with product information in a unified database would lessen costs for patentees. Both the aesthetic and monetary costs for marking products with patent information would cease to exist. By simply amending a patent online on the EFS-Web system with a PDF, the patentee can avoid the costs of marking.

Relatedly, the problem of software patent marking would also be solved. This applies to other industries that face similar marking issues. Instead of having to mark on physical CDs or on the software’s launch screen,²⁵⁸ the patentee relying on the USPTO’s database would serve a more effective means of constructive notice.

For the public at large, they would need to only check the USPTO’s unified database instead of relying on patentee websites which could present patent information ineffectively. Combine this with the obligation on patentees to continually update their commercial patents, the unified database could be everyone’s one-stop-shop for every aspiring inventor’s patent searches.

256. Currently, 3M maintains a webpage that lists its products along with each product’s patents. *3M Patent Marking*, 3M, https://www.3m.com/3M/en_US/company-us/patent (last visited Mar. 1, 2021). While this method, I think, works fine, 3M is still in ultimate control if it wants to change this method.

257. See *supra* Section III.B.

258. See *supra* Section III.B.

By eliminating the duty to mark, the false marking statute may lose more of its relevance, especially after Congress already recently cut back on the scope of false marking claims.²⁵⁹ But if there is no risk of false marking suits (assuming the patentee chooses not to mark and only update the database), there are also less costs associated with associating patents with products. One solution could be to apply false marking liability if patentees falsely associate patents to products on the unified patent-product database. This would help preserve the accuracy of the database. But no matter the fate of false marking, the competitive advantage of marking a product could still be attractive²⁶⁰ and justify the risk of false marking claims.

The USPTO managing the website would also prevent issues regarding privacy and maintenance, as discussed previously.²⁶¹ The public would reliably access patent information without worry that their personal information is not being tracked or sold.

Finally, because the database would reflect the true owner of the patent, there is less confusion over who truly owns a patent. Similar to the disclosure issue, this proposal does not introduce a requirement to update patent ownership. But if an assignee seeks to produce a product using an assigned patent, the assignee is required to ensure that the product and its associated patent actually indicate that the assignee owns the patent. As a result, assignees have an incentive to contract with the original patent owner to ensure that the patent owner updates the USPTO stating that the assignee owns the patent.

D. ISSUES AND CONCERNS

One issue related to this proposal involves enforcement on patentees to use the system. The first concern is the fact that the proposal does not require patentees to update their patents.²⁶² The proposal only seeks to place a duty to update, which depends on the incentive to accrue damages if patentees update their patents. Also, updating patents should be cheaper and take relatively less time. Minimizing this cost to maximize damages should encourage patentees to participate in the database. Still, there is always the lingering pressure for patentees to avoid making their patents more public than they already are.²⁶³ Keeping intellectual property secret to avoid copying is always a problem faced with any patent disclosure system.²⁶⁴

Another foreseeable issue with this topic is educating current and future patentees about changes to the patent regulation process. Solutions to this

259. See *supra* Section II.B.

260. See *supra* Section II.B.

261. See *supra* Section III.B.

262. Cf. Fromer, *supra* note 58, at 1715–16 (proposing that amending patent-product information should be legally required with costs borne by patentees).

263. *Id.* at 1731.

264. See *id.*

issue could engage in extensive publicity to notify companies and the public alike. This could include publishing press releases, announcing the change at technology shows and gatherings, and simply contacting legal counsel for prolific patenting entities and patent search firms.

Although it cannot be avoided, the U.S. government would bear the costs and burden of creating and maintaining the database.²⁶⁵ The government may also offset some of the additional cost by adding fees when patentees update their patents on the united database.²⁶⁶ The intricacies of budgeting, however, go beyond the scope of this Note.

Lastly, the proposal does not solve the problems related to patentees with large portfolios finding all possible patents that are associated with their products. Still the proposal's cost-savings could divert some of the time and money patentees spend to establish that a product is actually covered by all of the patentee's applicable patents. The problem of matching all possible patents to products is a natural consequence within sophisticated industries like computer software.

V. CONCLUSION

If the United States seeks to minimize societal costs of patent searching and increase innovation, it should constantly strive to improve the patent system's notice function. Search and internet technology have already come a long way. It is time that the USPTO caught up with the times and ensure that the patent system rewards innovation while promoting the public good. A unified database listing products and their associated patents would be a major step towards this purpose. There already exists a template in the Orange Book, and the USPTO would be wise to use it as a template for patent purposes.

265. Specifically, the USPTO requested \$755.7 million to for its "IT infrastructure and support services." U.S. PAT. & TRADEMARK OFF., FISCAL YEAR 2021 CONGRESSIONAL JUSTIFICATION 14-17 (2020), <https://www.uspto.gov/sites/default/files/documents/fy21pbr.pdf> [<https://perma.cc/XJF3-PDFM>]. This number, however, includes maintaining trademarks and copyrights, in addition to patents. *Id.* For patent-related operations in IT, the USPTO requested \$196.850 million. *Id.* at 15, 28 (listing the amount requested under "Patent Information Resources"). The specifics on how much the USPTO spends on maintaining their current patent database (patft.uspto.gov) is unknown.

266. In 2021, the USPTO expects to collect around \$3,251,000,000 in fees. *Id.* at 9. This number could be increased to help offset the cost of maintaining a unified patent database. In fact, the amount of fees that the USPTO expects to collect already covers most of what the USPTO expects to be its operating costs for 2021, which is \$3,874,000,000. *Id.* at 5.