

Ten Thousand AI Systems Typing on Keyboards: Generative AI in Patent Applications and Preemptive Prior Art

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ABSTRACT

Generative AI makes it possible to create unlimited amounts of text at essentially zero cost. While this technology has many benefits, it can also be used in ways that undermine the goals of the patent system. This Article identifies policy solutions to address the potentially anti-innovative application of generative AI in several patent-related contexts. First, it examines the use of AI to publish massive online databases of preemptive prior art intended to foreclose patentability. This Article argues that computer-generated invention descriptions published without any substantive nexus to human understanding of their contents should not count as “printed publications” under US patent law. In addition, this Article considers the use of AI to automate the process of writing and filing enormous numbers of patent applications. It also explores the associated market incentives as well as the potential role of regulatory measures and market forces to provide a corrective effect.

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I. INTRODUCTION

Since its inception, the patent system has relied upon the assumption—correct until recently—that drafting patent applications and other documents describing inventions required a significant commitment of time and effort.¹ That assumption no longer holds true. Generative artificial intelligence (AI) makes it possible to produce

1. Patent specifications are commonly many thousands of words in length. See, e.g., Dennis Crouch, *Does Size Matter? Counting Words in Patent Specifications*, PATENTLYO (Dec. 20, 2007), <https://patentlyo.com/patent/2007/12/does-size-matte.html> [<https://perma.cc/CPG2-9RV3>].

essentially unlimited quantities of text and drawings rapidly and at near zero cost.²

In the context of patent applications and publications relating to patentable subject matter, this rapidly advancing aspect of AI will have profound consequences. This Article argues that while AI, including generative AI, is a valuable and important tool to complement human creativity and inventive capacity, the patent system should not support, incentivize, or reward uses of AI writing that lack a nexus to human innovation.

While a large body of prior academic work exists addressing the broader topic of AI and inventions,³ very little formal academic scholarship on the subtopic of generative AI in relation to writing patent applications and other publications describing inventions is presently available.⁴ However, such scholarship will undoubtedly proliferate given the current significant public interest in generative AI.

This Article explores the policy challenges associated with the easy, nearly costless creation of massive amounts of AI-generated content, including its use in ways that can undermine the goals of the patent system.⁵ More specifically, it examines the potential anti-innovation use of generative AI in two patent-related contexts: publishing enormous volumes of AI-generated preemptive public

2. For example, access to ChatGPT is free, and a subscription to ChatGPT Plus currently costs \$20 per month. *See, e.g.*, Sabrina Ortiz, *How to Subscribe to ChatGPT Plus (and Why You Should)*, ZDNET (Jan. 29, 2024, 6:49 AM), <https://www.zdnet.com/article/how-to-subscribe-to-chatgpt-plus-and-why/> [<https://perma.cc/6ZZ3-M94Q>].

3. *See, e.g.*, Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079 (2016); Russ Pearlman, *Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law*, 24 RICH. J.L. & TECH. 1 (2018); Shlomit Yanisky Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215 (2018); Michael McLaughlin, *Computer-Generated Inventions*, 101 J. PAT. & TRADEMARK OFF. SOC'Y 224 (2019); Kaelyn R. Knutson, Note, *Anything You Can Do, AI Can't Do Better: An Analysis of Conception as a Requirement for Patent Inventorship and a Rationale for Excluding AI Inventors*, 11 CYBARIS 1 (2020); Ben Kovach, Note, *Ostrich with Its Head in the Sand: The Law, Inventorship, & Artificial Intelligence*, 19 NW. J. TECH. & INTELL. PROP. 137 (2021); Mimi S. Afshar, *Artificial Intelligence and Inventorship—Does the Patent Inventor Have to be Human?*, 13 HASTINGS SCI. & TECH. L.J. 55 (2022); Pheh Hoon Lim & Phoebe Li, *Artificial Intelligence and Inventorship: Patently Much Ado in the Computer Program*, 17 J. INTELL. PROP. L. & PRAC. 376 (2022).

4. *See, e.g.*, Andrew P. Siuta, *The Benefits of Integrating AI Tools like ChatGPT in Patent Writing*, JD SUPRA (Mar. 21, 2023), <https://www.jdsupra.com/legalnews/the-benefits-of-integrating-ai-tools-7873406/> [<https://perma.cc/3DFL-9GW5>] (demonstrating one example of how informal news reporting sites, unlike formal law journals, are approaching the subtopic).

5. This Article focuses on US utility patent applications, the provisional applications to which they may claim priority, and prior art disclosures relevant to utility patents. It does not address the issues raised by generative AI in relation to design and plant patents.

disclosures with the goal of foreclosing patentability in relation to the disclosed subject matter, and using AI to generate and file very large numbers of patent applications.

There are multiple reasons why someone might want to use AI to these ends. Persons opposed the existence of the patent system (e.g., who are opposed on policy grounds to the limited monopoly it confers) might wish to render it less effective by using generative AI to reduce the opportunities for inventors to obtain new patents. Companies might hope to use generative AI to obtain their own patent rights to speculative future inventions that their employees have not yet conceived.

To address such challenges, this Article proposes a series of policy solutions, some of which involve interpretations of existing statutory law, regulations, and case law, and some of which call for new statutory law and Patent and Trademark Office (PTO) rulemaking. More specifically, it argues that massive databases of AI-generated preemptive public disclosures intended to eliminate patentability regarding the described subject matter should not count as “printed publication[s]” under US patent law, and that this interpretation is consistent with US Court of Appeals for the Federal Circuit case law.⁶

It also advocates for imposing a limit on the number of provisional applications to which a single utility application can claim priority.⁷ Alternatively, or additionally, it proposes reevaluating the PTO’s provisional application filing fees, which, as they currently stand, make it far less expensive to file many separate shorter applications than to file a single, long application containing the same information.⁸

The Article further argues that while conception, the core step in patentable invention generation, should be understood broadly enough to encompass collaborations between people and AI tools used as extensions of their minds, it should not be construed so broadly as to encompass alleged “inventions” described in AI-written disclosures where there is no substantive nexus between the inventions and their purported human inventors. Finally, this Article argues that the

6. See, e.g., *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1349 (Fed. Cir. 2016); the other Federal Circuit decisions discussed *infra* Section II.B.1.

7. A provisional application is an optional filing made with the PTO that can be advantageous under various scenarios; e.g., to inventors who have not yet lined up sufficient funding to file a formal “utility” application, but want to secure a priority date. See 35 U.S.C. § 111(b). To claim the benefit of a provisional application, the corresponding utility application must be filed within twelve months after the date of the provisional filing. 35 U.S.C. § 119(e).

8. A “size fee” is applied for applications exceeding 100 pages in length. See 37 C.F.R. § 1.16(s). As discussed *infra* Part III, this makes a longer filing more expensive than multiple shorter filings containing the same information.

market can help provide a corrective effect through counterbalancing the incentives to flood the PTO with AI-written applications.

A. Generative Artificial Intelligence

The field of artificial intelligence has its roots in the mid-twentieth century work of pioneering computer scientist Alan Turing, who in 1950 published a now-classic paper asking the question, “Can machines think?”⁹ As AI research advanced through the 1980s,¹⁰ 1990s,¹¹ and the first several decades of the twenty-first century,¹² so too did the capabilities of the chips used to power computers.¹³ In combination, these advances in AI algorithms and the computational and storage resources available to implement them have created a rapidly growing set of opportunities for businesses to incorporate AI into their products, services, and internal operations.

In recent years, a growing number of businesses have adopted AI. According to a December 2022 McKinsey report documenting a recent survey of businesses, the number of respondents using AI in at least one business unit or function had more than doubled since 2017.¹⁴ AI has an essentially endless list of applications, including drug

9. Alan M. Turing, *Computing Machinery and Intelligence*, 59 MIND 433, 433 (1950).

10. See, e.g., Andrew Pollack, *Selling Artificial Intelligence*, N.Y. TIMES (Sept. 13, 1982), <https://www.nytimes.com/1982/09/13/business/selling-artificial-intelligence.html> [<https://perma.cc/WDP2-UTT6>].

11. See, e.g., George Johnson, *To Test a Powerful Computer, Play an Ancient Game*, N.Y. TIMES (July 29, 1997), <https://www.nytimes.com/1997/07/29/science/to-test-a-powerful-computer-play-an-ancient-game.html> [<https://perma.cc/PR4D-ATVQ>].

12. See, e.g., John Markoff, *Pursuing the Next Level of Artificial Intelligence*, N.Y. TIMES (May 3, 2008), <https://www.nytimes.com/2008/05/03/technology/03koller.html> [<https://perma.cc/5KQ7-43X3>]; Anahad O’Connor, *How Artificial Intelligence Could Transform Medicine*, N.Y. TIMES (Mar. 11, 2019), <https://www.nytimes.com/2019/03/11/well/live/how-artificial-intelligence-could-transform-medicine.html> [<https://perma.cc/D5YZ-WJ5L>]; Michael Totty, *The Worlds That AI Might Create*, WALL ST. J. (Oct. 13, 2019, 10:05 PM ET), <https://www.wsj.com/articles/the-worlds-that-ai-might-create-11571018700> [<https://perma.cc/R5VK-QLX4>].

13. See, e.g., Adobe Acrobat Team, *Fast-Forward—Comparing a 1980s Supercomputer to the Modern Smartphone*, ADOBE BLOG (Nov. 8, 2022), <https://blog.adobe.com/en/publish/2022/11/08/fast-forward-comparing-1980s-supercomputer-to-modern-smartphone> [<https://perma.cc/WL7H-T9QE>].

14. Michael Chui, Bryce Hall, Helen Mayhew, Alex Singla & Alex Sukharevsky, *The State of AI in 2022—And a Half Decade in Review*, MCKINSEY & CO. (Dec. 6, 2022), <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review#> [<https://perma.cc/8E4N-KJMZ>] (stating that “in 2017, 20 percent of respondents reported adopting AI in at least one business area, whereas today, that figure stands at 50 percent, though it peaked higher in 2019 at 58 percent”).

discovery,¹⁵ clinical medicine,¹⁶ weather forecasting,¹⁷ autonomous vehicles,¹⁸ agriculture,¹⁹ education,²⁰ and supply chain management.²¹

Generative AI refers to a specific type of AI that uses “deep-learning models that can generate high-quality text, images, and other content based on the data they were trained on.”²² As of late 2023, the most widely known example of generative AI is ChatGPT, an OpenAI chatbot publicly released in late 2022.²³ ChatGPT produces text outputs based on an underlying large language model (LLM), which “is a deep learning algorithm that can recognize, summarize, translate, predict[,] and generate text and other forms of content based on knowledge gained from massive datasets.”²⁴

ChatGPT uses the GPT-3.5 LLM.²⁵ In early 2023, OpenAI released ChatGPT Plus, a subscription-based chatbot that can produce

15. See, e.g., Will Douglas Heaven, *AI Is Dreaming up Drugs That No One Has Ever Seen. Now We've Got to See If They Work.*, MIT TECH. REV. (Feb. 15, 2023), <https://www.technologyreview.com/2023/02/15/1067904/ai-automation-drug-development/> [https://perma.cc/V6MF-R6B9].

16. See, e.g., Charlotte J. Haug & Jeffrey M. Drazen, *Artificial Intelligence and Machine Learning in Clinical Medicine, 2023*, 388 N. ENG. J. MED. 1201 (2023), <https://www.nejm.org/doi/full/10.1056/NEJMra2302038> [https://perma.cc/3RZN-GGUE].

17. See, e.g., Priya Donti, *How AI Can Help Predict Weather in the Era of Climate Change*, FAST CO. (Mar. 3, 2023), <https://www.fastcompany.com/90859814/ai-help-improve-weather-forecasts> [https://perma.cc/4TNY-VRC5].

18. See, e.g., Andrew Myers, *How AI Is Making Autonomous Vehicles Safer*, STANFORD UNIV. (Mar. 7, 2022), <https://hai.stanford.edu/news/how-ai-making-autonomous-vehicles-safer> [https://perma.cc/N62D-CG53].

19. See, e.g., Lutz Goedde, Joshua Katz, Alexandre Ménard & Julien Revellat, *Agriculture's Connected Future: How Technology Can Yield New Growth*, MCKINSEY & CO. (Oct. 9, 2020), <https://www.mckinsey.com/industries/agriculture/our-insights/agricultures-connected-future-how-technology-can-yield-new-growth> [https://perma.cc/66XM-XVVN].

20. See, e.g., Claire Chen, *AI Will Transform Teaching and Learning. Let's Get It Right.*, STAN. UNIV. (Mar. 9, 2023), <https://hai.stanford.edu/news/ai-will-transform-teaching-and-learning-lets-get-it-right> [https://perma.cc/T8CU-WXP2].

21. See, e.g., James Rundle, *Supply Chain Strains Sharpen Focus on AI*, WALL ST. J. (Mar. 31, 2021, 4:12 PM), <https://www.wsj.com/articles/supply-chain-strains-sharpen-focus-on-ai-11617221551> [https://perma.cc/9H5L-Y3QN].

22. Kim Martineau, *What Is Generative AI?*, IBM (Apr. 20, 2023), <https://research.ibm.com/blog/what-is-generative-ai> [https://perma.cc/6ZLF-JV69].

23. See Kevin Roose, *The Brilliance and Weirdness of ChatGPT*, N.Y. TIMES (Dec. 5, 2022), <https://www.nytimes.com/2022/12/05/technology/chatgpt-ai-twitter.html> [https://perma.cc/JQ8D-W6HU].

24. Angie Lee, *What Are Large Language Models Used For?*, NVIDIA (Jan. 26, 2023), <https://blogs.nvidia.com/blog/what-are-large-language-models-used-for/> [https://perma.cc/U386-EWCA].

25. *Introducing ChatGPT*, OPENAI (Nov. 30, 2022), <https://openai.com/blog/chatgpt> [https://perma.cc/8F9U-ZD4L] (noting that “ChatGPT is fine-tuned from a model in the GPT-3.5 series, which finished training in early 2022”).

outputs generated using a more advanced LLM, GPT-4.²⁶ Regardless of version, ChatGPT can generate longform answers to prompts, allowing it to engage in conversation-like interactions with human users.²⁷ It can also write essays and poetry as well as write, read, and debug computer code.²⁸

In addition to its capacity to produce text outputs, generative AI can create images and video.²⁹ DALL·E, another OpenAI product, outputs highly realistic images in response to prompts such as “cats playing chess” and “a teapot in the shape of an avocado.”³⁰ Other examples of text-to-image generative AI products include Stability AI’s Stable Diffusion and Midjourney Inc.’s Midjourney.³¹ Generative AI can also produce audio, outputting music and vocals that very closely resemble those of specific human artists.³²

26. Eric Griffith, *GPT-4 vs. ChatGPT-3.5: What’s the Difference?*, PCMAG. (Mar. 16, 2023), <https://www.pcmag.com/news/the-new-chatgpt-what-you-get-with-gpt-4-vs-gpt-35> [https://perma.cc/39NF-WUQX].

27. Marcel Scharth, *The ChatGPT Chatbot Is Blowing People Away with Its Writing Skills. An Expert Explains Why It’s So Impressive*, THE CONVERSATION (Dec. 5, 2022, 11:48 PM), <https://theconversation.com/the-chatgpt-chatbot-is-blowing-people-away-with-its-writing-skills-an-expert-explains-why-its-so-impressive-195908> [https://perma.cc/V6CW-UWNH].

28. Kalhan Rosenblatt, *New Bot ChatGPT Will Force Colleges to Get Creative to Prevent Cheating, Experts Say*, NBC NEWS (Dec. 7, 2022, 5:06 PM), <https://www.nbcnews.com/tech/chatgpt-can-generate-essay-generate-rcna60362> [https://perma.cc/98AU-QUNG]; James Chaarani, *ChatGPT Wrote a Poem About Winter, but Is It Truly Art? This Waterloo AI Ethicist Weighs in*, CBC (Jan. 5, 2023, 6:00 AM), <https://www.cbc.ca/news/canada/kitchener-waterloo/chatgpt-ai-text-university-waterloo-maura-grossman-1.6703819> [https://perma.cc/3XRS-CFAR]; David Gewirtz, *Okay, So ChatGPT Just Debugged My Code. For Real.*, ZDNET (Oct. 3, 2023, 1:26 PM), <https://www.zdnet.com/article/okay-so-chatgpt-just-debugged-my-code-for-real/> [https://perma.cc/C4MR-46G6].

29. See, e.g., Cade Metz, *Instant Videos Could Represent the Next Leap in A.I. Technology*, N.Y. TIMES (Apr. 4, 2023), <https://www.nytimes.com/2023/04/04/technology/runway-ai-videos.html> [https://perma.cc/UTB8-2ARJ].

30. Cade Metz, *Meet DALL-E, the A.I. That Draws Anything at Your Command*, N.Y. TIMES (Apr. 6, 2022), <https://www.nytimes.com/2022/04/06/technology/openai-images-dall-e.html> [https://perma.cc/3ZAN-NVK9].

31. See *Stable Diffusion Public Release*, STABILITY.AI (Aug. 22, 2023), <https://stability.ai/blog/stable-diffusion-public-release> [https://perma.cc/BL5R-GY4L]; Kevin Roose, *An A.I.-Generated Picture Won an Art Prize. Artists Aren’t Happy*, N.Y. TIMES (Sept. 2, 2022), <https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html> [https://perma.cc/U7QD-2XSG].

32. Joe Coscarelli, *An A.I. Hit of Fake ‘Drake’ and ‘The Weeknd’ Rattles the Music World*, N.Y. TIMES, <https://www.nytimes.com/2023/04/19/arts/music/ai-drake-the-weeknd-fake.html> [https://perma.cc/PQ4Q-H56L] (Apr. 24, 2023).

B. The Patent System and AI

Patents are a form of intellectual property that protect inventions.³³ Authority for the patent (and copyright) system is grounded in the Constitution, which grants Congress the 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.”³⁴ The patent system gives inventors an incentive to disclose their inventions to the public in return for a set of time-limited patent rights.

As the US Patent and Trademark Office explains, “[t]here are three types of patents: utility, design and plant.”³⁵ This Article considers “utility” patents, which “may be granted to anyone who invents or discovers a new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvements of these.”³⁶ A US utility patent gives its owner the right, during the term of the patent, to exclude others from making, using, selling, or offering to sell an invention in the United States, as well as from importing the invention into the United States.³⁷

A US patent is enforceable in the United States, but not abroad.³⁸ Similarly, non-US patents are not enforceable in the United States.³⁹ Once the PTO grants a US utility patent, provided that its owner pays maintenance fees, it generally remains in force until twenty years after the filing date of the earliest US utility application to which it claims priority.⁴⁰

33. See, e.g., *Patent Essentials*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/basics/essentials#questions> [<https://perma.cc/K9E8-3LNT>] (last visited Feb. 2, 2024).

34. See U.S. CONST. art. 1, § 8, cl. 8.

35. *Applying for Patents*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/basics/apply> [<https://perma.cc/9VAK-3NXC>] (last visited Feb. 2, 2024).

36. *Id.*

37. 35 U.S.C. § 271(a).

38. See *id.* (providing that a patent owner’s right to exclude applies in the United States).

39. See, e.g., *Frequently Asked Questions: Patents*, WORLD INTELL. PROP. ORG., https://www.wipo.int/patents/en/faq_patents.html [<https://perma.cc/JZ29-65UN>] (last visited Feb. 2, 2024) (“Is a patent valid in every country? Patents are territorial rights. In general, the exclusive rights are only applicable in the country or region in which a patent has been filed and granted.”).

40. See 35 U.S.C. § 154(a)(2). There are some exceptions to the twenty-year term, including, for example, terminal disclaimers as provided in 37 C.F.R. § 1.321, as well as handling of patent applications claiming priority to international applications as provided in 35 U.S.C. § 365. See U.S. PAT. & TRADEMARK OFF., *MANUAL OF PATENT EXAMINING PROCEDURE* § 2701 (2023) [hereinafter MPEP]. For patents claiming priority to a provisional application, the provisional filing date is not considered when computing patent term. See § 154(a)(3); MPEP § 2701.

An inventor seeking to obtain a utility patent files a utility patent application with the PTO.⁴¹ Typically, an inventor works with a patent attorney or patent agent to prepare and ultimately submit this filing.⁴² In examining the application to determine whether to grant a patent, the PTO evaluates, among other things, whether the invention is novel and whether it is non-obvious to a “person of ordinary skill in the art” (POSITA).⁴³ In assessing novelty and nonobviousness, the PTO considers “prior art,” which the PTO has explained is “[i]nformation known publicly before the effective filing date of a US patent application,” and can include “U.S. patents and published patent applications;” “[f]oreign patents and published patent applications;” “[j]ournal and magazine articles;” “[b]ooks, manuals, and catalogs;” “[w]ebsites;” “[c]onference proceedings;” and “[s]cientific papers.”⁴⁴

Prior to filing a utility application, an inventor can, but is not obligated to, file a “provisional” application.⁴⁵ As the PTO explains, a “provisional application is not required to have a formal patent claim or an oath or declaration A provisional application provides the means to establish an early effective filing date in a later filed [utility] patent application.”⁴⁶

A provisional application can be attractive to inventors and companies that, for strategic or financial reasons, want to secure a priority date with respect to the information disclosed in the provisional, but are not yet ready to draft and file a utility application. If an inventor files a provisional application, the examination process in relation to the invention will not begin unless and until the inventor files a utility application claiming priority to the provisional application.⁴⁷ If this does not occur within twelve months of the

41. *Applying for Patents*, *supra* note 35.

42. The PTO has a Pro Se Assistance Program that “provides outreach and education to applicants (also known as “pro se” applicants) who file patent applications without the assistance of a registered patent attorney or agent.” *Filing a Patent Application on Your Own*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/basics/using-legal-services/pro-se-assistance-program> [<https://perma.cc/G49F-4M6Y>] (last visited Feb. 2, 2024) (parentheses in original).

43. *See* 35 U.S.C. §§ 102(a), 103.

44. U.S. PAT. & TRADEMARK OFF., PATENT SEARCHING AND SEARCH RESOURCES—AN INTRODUCTION 5, <https://www.uspto.gov/sites/default/files/documents/Basics-of-Prior-Art-Searching.pdf> [<https://perma.cc/N49G-PRHS>] (last visited Feb. 2, 2024).

45. *See* 35 U.S.C. § 111(b); MPEP, *supra* note 40, § 201.01.

46. *Provisional Application for Patent*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/basics/apply/provisional-application> [<https://perma.cc/9R6P-W9CL>] (last visited Feb. 2, 2024).

47. *See id.*

provisional filing date, the provisional application becomes abandoned.⁴⁸

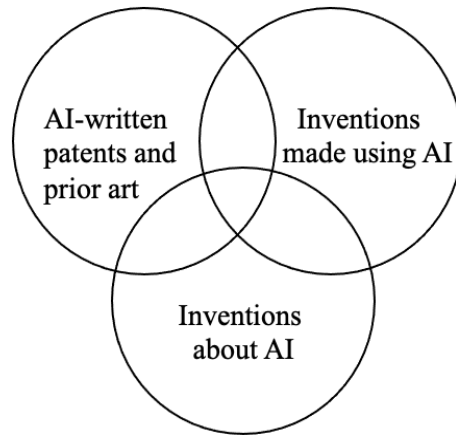
Against this backdrop, this Article explores how an actor wishing to eliminate patentability opportunities could use generative AI to produce and publish large text databases aimed at augmenting the universe of prior art. This Article also considers the incentives and business models that might lead companies to use generative AI to write and then file large numbers of provisional or utility applications with the PTO.

Like most technologies, AI has both beneficial and problematic uses. In relation to patents, AI can be a powerful tool to complement human creativity. To take one example of many, scientists can use AI to rapidly identify the shapes of proteins, which creates enormous potential to identify new drugs that might otherwise have remained undiscovered.⁴⁹ The patent system should recognize and reward human innovators who use AI in this manner, and, more generally, who use AI tools as extensions of their mind, enhancing their ability to identify useful scientific advances.⁵⁰ Inventors can also use AI to help *create* new inventions *about* AI itself (e.g., for novel methods to use machine learning to improve safety in autonomous vehicles). Finally, AI can help produce text and images that *describe* inventions, such as by expediting the drafting of patent applications and generation of prior art disclosures. The Venn diagram below illustrates these three ways that AI can arise in relation to patents:

48. *Id.* (“A provisional application automatically becomes abandoned when its pendency period expires 12 months after the provisional application filing date by operation of law.”).

49. *See, e.g.*, Ewen Callaway, *‘It Will Change Everything’: DeepMind’s AI Makes Gigantic Leap in Solving Protein Structures*, NATURE (Nov. 30, 2020), <https://www.nature.com/articles/d41586-020-03348-4> [<https://perma.cc/LAA3-HQYT>]; Jeremy Hsu, *AI Discovers New Class of Antibiotics to Kill Drug-Resistant Bacteria*, NEW SCIENTIST (Dec. 20, 2023), <https://www.newscientist.com/article/2409706-ai-discovers-new-class-of-antibiotics-to-kill-drug-resistant-bacteria/> [<https://perma.cc/E3JH-UVRH>]; John Villasenor, *Reconceptualizing Conception: Making Room for Artificial Intelligence Inventions*, 39 SANTA CLARA HIGH TECH. L.J. 197, 204 (2023).

50. *See, e.g., id.* at 199.



As the upper left circle conveys, AI can write patent applications (which can subsequently mature into patents) describing inventions, and produce prior art. As the upper right circle shows, AI can make inventions. As the bottom circle indicates, inventions themselves can involve AI. The Venn diagram also shows that any two of these circles, as well as all three of these circles, can overlap. This Article is directed to the upper left circle of the above figure; i.e., inventors' use of AI for writing patent applications and patent-related prior art, including its overlap with the other circles in the diagram.

Using AI to help write patent applications is not inherently problematic. It raises no policy concerns if an inventor conceives an invention and then uses AI to expedite the process of describing it in words and in drawings. AI writing tools can also help patent attorneys and patent agents more quickly draft patent applications and drawings, allowing these professionals to serve a broader set of clients—including some who might not otherwise have been able to hire their services. But a technology as powerful as generative AI is also ripe for misuse that undermines the goals of the patent system.

The remainder of this Article proceeds as follows: Part II explores the use of generative AI to create and publish massive online databases of preemptive disclosures intended to render future inventions regarding the described subject matter unpatentable; Part III considers AI-generated provisional and utility application filings, including the associated financial incentives the PTO's fee structure creates; Part IV provides conclusions, underscoring that a combination of policy responses and market pressures can help mitigate the incentives to undermine the patent system through anti-innovative uses of generative AI.

II. AI-GENERATED PREEMPTIVE PRIOR ART DISCLOSURES

A. *Motivations and Methods*

Algorithms, including generative AI,⁵¹ make it possible to create and then publish on the internet massive databases of invention-relevant disclosures with the goal of foreclosing patentability for any inventions the content of the databases describes or renders obvious. Efforts to publish content with this purpose in mind are not new. The creators of the website allpriorart.com aim to “algorithmically create and publicly publish all possible new prior art, thereby making the published concepts not patentable.”⁵² The “About” page of allpriorart.com further states:

The system works by pulling text from the entire database of US issued and published (un-approved) patents and creating prior art from the patent language. While most inventions generated will be nonsensical, the cost to computationally create and publish millions of ideas is nearly zero – which allows for a higher probability of possible valid prior art.⁵³

The Wayback Machine, a digital internet archive, indicates that allpriorart.com has been in existence since at least as early as 2016, years before the wide public availability of generative AI tools.⁵⁴ As generative AI becomes increasingly capable and accessible, it will inevitably be applied to create and publish databases of preemptive prior art.

At least two goals might motivate a person or group to undertake this preemptive effort. One is to preclude or at least impede patentability for *everyone* in relation to the disclosed subject matter. This goal could arise from a belief that doing so will help curb perceived abuses of the patent system, or from a philosophical opposition to the existence of the patent system.⁵⁵ Alternatively, someone might aim to publish AI-generated databases of preemptive prior art with the goal of preventing *other* people from obtaining US (or foreign) patents on the disclosed subject matter, while simultaneously creating a one-year

51. Not all algorithms are AI, but all AI—including generative AI—use algorithms. See *What Is Generative AI?*, NVIDIA, <https://www.nvidia.com/en-us/glossary/generative-ai/> [<https://perma.cc/3D8Z-HF6T>] (last visited Feb. 2, 2024).

52. Alexander Reben, *About*, ALL PRIOR ART, <http://allpriorart.com/about/> [<https://perma.cc/J7YS-N5YR>] (last visited Feb. 5, 2024).

53. *Id.*

54. *See id.*

55. *Id.* There is, of course, plenty of room for policy debate regarding the role of patents, the strengths and weaknesses of current patent law, and the nature of potential reforms. Participation in that policy debate is likely to be more effective for affecting change than is flooding the internet or the PTO with AI-generated invention-relevant text. See, e.g., Afshar, *supra* note 3.

window of opportunity for the *publisher* to seek US patent protection. US patent law provides a one-year grace period so that an inventor's own public disclosures in the year or less prior to the effective filing date of an application are not prior art in the United States with respect to that inventor's claimed invention.⁵⁶ Those same public disclosures are, however, prior art that can prevent other people who later independently conceive the same invention from obtaining a patent.⁵⁷

The 2011 America Invents Act (AIA) is sometimes described as moving the United States from a first-to-invent system to a first-to-file system for patent applications with an effective filing date of March 16, 2013 or later.⁵⁸ However, the term "first-to-file" fails to convey a key nuance: Because the AIA left the one-year grace period for an inventor's own public disclosures intact, a better, though more cumbersome term might be "first-to-file-or-to-disclose."⁵⁹

If neither international patent protection nor keeping an invention secret until the latest date possible is an inventor's goal, post-AIA US patent law can create an incentive to preemptively publish disclosures. Such disclosures would give the publisher a one-year window to file a US patent application while simultaneously foreclosing patenting opportunities for others. The publisher could then use the one-year window to write and file patent applications relating to the disclosed content.

An example is helpful to illustrate how a company might use generative AI to produce public disclosures aimed at locking up patentability in a particular field of art. The company could train an AI system on issued patents, published patent applications, academic papers, citations to papers and patents, and product literature in the relevant field. Once the training is complete, the company could instruct the system to generate a massive disclosure database, which the company would then publish online to start the one-year clock ticking.

56. 35 U.S.C. § 102(b)(1) (providing a one-year grace period). This grace period applies specifically to the U.S. patent system. Disclosures in advance of the filing of a US utility application can be invalidating in non-US jurisdictions.

57. § 102(a)(1).

58. See Leahy-Smith America Invents Act of 2011, Pub. L. No. 112-29, 125 Stat. 284, 293 (2011). The AIA changes to 35 U.S.C. §§ 102, 103 were effective for patent applications with an effective filing date on or after March 16, 2013. See also 35 U.S.C. § 100(i)(1) (defining "effective filing date"); MPEP, *supra* note 40. The use of the terminology "first to file" is understandable in light of the fact that the AIA itself characterizes the post-AIA system using the very similar phrase "First Inventor to File." See 125 Stat. at 285.

59. See, e.g., John Villasenor, *Untangling the Real Meaning of "First-To-File" Patents*, BROOKINGS INST. (Mar. 8, 2012), <https://www.brookings.edu/articles/untangling-the-real-meaning-of-first-to-file-patents/> [<https://perma.cc/FSU5-MQFY>].

The costs of maintaining such an online database are low relative to the amount of data involved. The menu of choices offered by Azure Cloud Services, a Microsoft cloud computing offering, illustrates this point; as of late 2023, such choices included a “general purpose” option designed for “websites, small-to-medium databases, and other everyday applications” offering 2,040 GB of temporary storage and 14 GB of RAM for about \$460/month.⁶⁰ These costs will decline in the future due to continued improvements in memory and computing technology.⁶¹

Publishers would not necessarily seek to ensure that the database was well organized or even coherent in any holistic sense. Rather, they would count on the combination of training data relevance and sheer volume to ensure that some of the output contains useful disclosure. After publishing the database, its creators could then perform an AI-based search through the database to identify the most patent-relevant content. Before the conclusion of the twelve-month window following publication, they could write (again, with AI assistance) and submit patent applications using information they extracted from the database. In doing so, they would aim to be the only individuals (or corporate entities) with an option to patent any disclosed inventions, as they would hope that the published database would preclude anyone else from patenting those inventions.⁶²

The preceding scenario is clearly problematic from a policy standpoint, as it would potentially enable patent applicants to retroactively assert conception for inventions that in reality they did not conceive until well after the original publication of the database. However, this scenario only works as intended if disclosure databases AI generates in the manner described above constitute prior art. As this Article discusses next, strong arguments support the conclusion that such databases should not qualify as prior art.

60. *Cloud Services Pricing*, MICROSOFT, <https://azure.microsoft.com/en-us/pricing/details/cloud-services/> [<https://perma.cc/LND5-DVDC>] (last visited Feb. 2, 2024). The listed cost for this configuration is 64 cents per hour, which, assuming 720 hours in a month, corresponds to \$461 per month. *See id.*

61. *See, e.g., Historical Cost of Computer Memory and Storage*, OUR WORLD IN DATA, <https://ourworldindata.org/grapher/historical-cost-of-computer-memory-and-storage> [<https://perma.cc/44F8-JYM8>] (last visited Feb. 2, 2024).

62. Of course, the publisher’s disclosure wouldn’t *guarantee* patentability, as the resulting inventions might be anticipated or obvious in light of other prior art. But the publisher’s disclosure could *preclude* patentability for anyone else who had not already applied for a patent on, or otherwise disclosed within the past year but after the disclosure date of the preemptive prior art publisher, any inventions described in the publisher’s database. *See* §§ 102(a)(1), (b)(1).

B. Are Massive AI-Generated Disclosure Databases Prior Art?

In answering this question, it is important to examine the meaning of “printed publication,” in post-AIA § 102(a).⁶³ In relevant part, post-AIA § 102(a) provides that “[a] person shall be entitled to a patent unless . . . the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.”⁶⁴ This Article also considers the statutory text “or otherwise available to the public,” which the AIA added.⁶⁵

1. *Blue Calypso* and “Printed Publication”

While the interpretation of “printed publication” specifically in relation to post-AIA § 102(a) has not been extensively litigated, the same phrase was also present in pre-AIA § 102(a).⁶⁶ In that context, as discussed below, the Federal Circuit has addressed this phrase in multiple cases.⁶⁷ It is therefore reasonable to assume that “printed publication” has the same meaning in both pre- and post-AIA § 102.

A “printed publication” under § 102 can encompass publications available only online.⁶⁸ But material available online is not automatically a “printed publication.” Rather, as the Federal Circuit wrote in 2012, “the ultimate question is whether the reference was ‘available to the extent that persons interested and ordinarily skilled in the subject matter or art[,] exercising reasonable diligence, can locate

63. § 102(a)(1).

64. *Id.* This quotation omits the semicolon and the word “or” that terminates this sentence, as well as § 102(a)(2).

65. See, e.g., *Comparison of Selected Sections of Pre-AIA and AIA U.S. Patent Law*, INTELL. PROP. OWNERS ASSOC. 1, https://ipo.org/wp-content/uploads/2013/03/Patent_Reform_Chart_Comparison_of_AIA_and_Pre-AIA_Laws_FINAL.pdf [<https://perma.cc/JJ8R-PG72>] (last visited Feb. 2, 2024) (showing that the AIA added “or otherwise available to the public” to § 102(a)); see also America Invents Act of 2011, Pub. L. No. 112-29, § 3(b)(1), 125 Stat. 284, 285 (providing that “Section 102 of title 35, United States Code, is amended to read as follows,” with the new § 102 text including “or otherwise available to the public”).

66. In relevant part, pre-AIA § 102 stated, “[a] person shall be entitled to a patent unless— (a) the invention was known or used by others in this country, or patented or described in a *printed publication* in this or a foreign country, before the invention thereof by the applicant for patent” MPEP, *supra* note 40, § 2132 (emphasis added).

67. See, e.g., *Voter Verified, Inc. v. Premier Election Sols., Inc.*, 698 F.3d 1374, 1379–80 (Fed. Cir. 2012).

68. See, e.g., *id.* at 1381 (concluding that an article from an online periodical qualified as prior art). For the pre-internet-browser era, see also *In re Wyer*, 655 F.2d 221, 227 (C.C.P.A. 1981) (concluding that prior art can be “printed, handwritten, or on microfilm or a magnetic disc or tape, etc.”).

it.”⁶⁹ A key determinant of public availability is whether a POSITA would have located the publication.⁷⁰

In 2016, the Federal Circuit examined these issues in *Blue Calypso, LLC v. Groupon, Inc.*, a case regarding a patent validity challenge involving “a report published on a webpage by a graduate student” at the University of Maryland.⁷¹ Groupon argued this report was publicly available and was thus prior art.⁷² The court explained that “[t]o qualify as a printed publication, a reference ‘must have been sufficiently accessible to the public interested in the art,’” and that Groupon bore the burden of making this showing.⁷³ The court further explained that there are two ways to satisfy this burden.⁷⁴

69. *Voter Verified, Inc.*, 698 F.3d at 1380 (quoting *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008)); *see also* *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1568 (Fed. Cir. 1988)) (a reference “must have been sufficiently accessible to the public interested in the art”); *Cordis Corp. v. Bos. Sci. Corp.*, 561 F.3d 1319, 1333 (Fed. Cir. 2009) (quoting *In re Weyer*, 655 F.2d at 226) (“A document is publicly accessible if it ‘has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it and recognize and comprehend therefrom the essentials of the claimed invention without need of further research or experimentation.’”).

70. *See Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)

71. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1337 (Fed. Cir. 2016). At issue were US Patent numbers: 7,664,516; 8,155,679; 8,457,670; 8,438,055; and 8,452,646. *Id.* at 1335. A search on Google Patents confirms that all of these patents have effective filing dates prior to March 16, 2013, meaning they are subject to pre-AIA § 102. *Method and System for Peer-to-Peer Advertising Between Mobile Communication Devices*, GOOGLE PATENTS, <https://patents.google.com/patent/US7664516B2/en?q=U.S.+Patent+Nos.+7%2c664%2c516;%2c155%2c679;%2c457%2c670;%2c438%2c055;%2c452%2c646> [https://perma.cc/6LRK-VBAU] (last visited Feb. 12, 2024) (Patent Number 7,664,516); *System and Method for Peer-to-Peer Advertising Between Mobile Communication Devices*, GOOGLE PATENTS, <https://patents.google.com/patent/US8155679B2/en?q=8%2c155%2c679> [https://perma.cc/A2W5-HQ3G] (last visited Feb. 12, 2024) (Patent Number 8,155,679); *System and Method for Peer-to-Peer Advertising Between Mobile Communication Devices*, GOOGLE PATENTS, <https://patents.google.com/patent/US8457670B2/en?q=8%2c457%2c670> [https://perma.cc/CTV9-TNMQ] (last visited Feb. 12, 2024) (Patent Number 8,457,670); *System and Method for Providing Endorsed Advertisements and Testimonials Between Communication Devices*, GOOGLE PATENTS, <https://patents.google.com/patent/US8438055B2/en?q=8%2c438%2c055> [https://perma.cc/M6V4-WDPL] (last visited Feb. 12, 2024) (Patent Number 8,438,055); *System and Method for Providing Endorsed Electronic Offers Between Communication Devices*, GOOGLE PATENTS, <https://patents.google.com/patent/US8452646B2/en?q=8%2c452%2c646> [https://perma.cc/6NJW-DSE7] (last visited Feb. 12, 2024) (Patent Number 8,452,646).

72. *Id.* at 1337.

73. *Id.* at 1348. (quoting *In re Cronyn*, 890 F.2d at 1160). Groupon bore the “burden of establishing that an interested party exercising reasonable diligence would have located Ratsimor.” *Id.* at 1349.

74. *See id.* at 1349–50.

First, the party bearing the burden can show that the reference was indexed so a POSITA can locate it by querying a search engine.⁷⁵ Alternatively, a reference can be publicly available even in “the absence of evidence demonstrating that the website at which the article was located was indexed and thereby findable by an internet search engine.”⁷⁶ In that situation, the party bearing the burden can show that a person of ordinary skill would have recognized the online venue of publication as “a prominent forum for discussing such technologies.”⁷⁷

The court concluded that Groupon had not met this burden under either approach.⁷⁸ Thus, under *Blue Calypso*, a reference is publicly available if (1) it is indexed by a search engine, or (2) it is published in a prominent forum.⁷⁹ However, the *Blue Calypso* court did not substantively address what indexing means; e.g., how easy it should be to find the publication in question using a search engine.⁸⁰ Furthermore, the court did not go into depth regarding how to assess whether a forum qualified as prominent.⁸¹

2. Why Massive AI Disclosure Databases Shouldn’t Be “Printed Publications”

Massive AI-generated preemptive disclosure databases should not qualify as printed publications under § 102.⁸² First, regarding indexing, the fact that a document is theoretically locatable by querying a search engine does not mean that a POSITA would know how to construct a search query to locate it. In discussing indexing, the *Blue Calypso* court cited its 1989 decision in *In re Cronyn*, explaining that a library card catalog “[i]ndex[ed] only by title and author’s name did not amount to the references being ‘either cataloged or indexed in a meaningful way.’”⁸³ By analogy, it seems reasonable to conclude that

75. *Id.* at 1350. (“The record is devoid of any evidence that a query of a search engine before the critical date, using any combination of search words, would have led to Ratsimor appearing in the search results.”). Indexing as one means to establish accessibility was also applied in the context of physical documents at libraries. *See, e.g.*, *In re Hall*, 781 F.2d 897, 899–900 (Fed. Cir. 1986).

76. *See Blue Calypso*, 815 F.3d at 1349 (citing *Voter Verified, Inc. v. Premier Election Sols., Inc.*, 698 F.3d 1374, 1381 (Fed. Cir. 2012)).

77. *Id.* (quoting *Voter Verified*, 698 F.3d at 1381).

78. *Id.*

79. *See id.*

80. *See id.* at 1349–50.

81. *See id.* at 1350.

82. *See* 35 U.S.C. § 102; *see also Blue Calypso*, 815 F.3d at 1350.

83. *Blue Calypso*, 815 F.3d. at 1350 (quoting *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989)).

under the indexing test, a difficult-to-locate online document buried in a massive AI-generated preemptive disclosure database is not available to a POSITA. If a POSITA could only find such a document using an extremely specific search engine query they would not reasonably know how to construct, under *In re Cronyn*, the database is unlikely to be meaningfully indexed.⁸⁴

A second question is whether an AI-generated preemptive disclosure database is a “prominent forum.” A forum is prominent if it is a place where persons working in the discipline publish the results of their good-faith efforts to advance the state of the art. It is “prominent” because of the perceived relevance and quality of the publications found there. Precisely for that reason, a POSITA is expected to know what it contains.

This is the opposite of what occurs with algorithmically generated preemptive disclosure databases. To take one example, the creators of allpriorart.com write that “most inventions generated will be nonsensical.”⁸⁵ It would make little sense to expect a POSITA to seek out and comb through mountains of mostly nonsensical text to identify potential nuggets of algorithmically generated content that might add to the state of knowledge in a particular domain. While an algorithmically produced disclosure database consisting of mostly nonsensical content might be “prominent” in the sense that a POSITA could be aware of its existence, it should not be a “prominent forum” in the sense of conferring prior art status on its contents.

Moving beyond the specifics of public accessibility tests, a more fundamental justification underscores why the contents of these AI-generated disclosure websites should not constitute prior art. The knowledge of a “*person* of ordinary skill in the art” is inextricably tied to what *people* know.⁸⁶ As such, a POSITA is expected to be aware of human knowledge in the art.⁸⁷ It is unreasonable to expect a POSITA to be aware of purported “art” for which there is no affirmative evidence that any human has understood its significance or relevance in advancing a field of art.

84. *See id.* at 1349–50. One interesting question in this context is whether the state of search engine technology might impact prior art status. A particular portion of a prior art database that might only be findable using a highly specific search query today might be findable with a much less specific query in the future when improved search engines are available. *See id.*

85. Reben, *supra* note 52.

86. *See, e.g.,* MPEP, *supra* note 40, § 2141.03 (stating that a POSITA is “a hypothetical person”) (emphasis added).

87. *Id.*

3. Some Counterarguments in Favor of “Printed Publication” Status

Proponents of AI-generated disclosure databases might look to the insufficiency of the card catalog indexing in *In re Cronyn*, which the *Blue Calypso* court noted has declining relevance in light of continued search technology advancements.⁸⁸ Under this counterargument, the fact of search engine indexing alone is sufficient as long as the indexed content can be found, regardless of how easy it is for a POSITA to find it. After all, in considering the indexing test, the court in *Blue Calypso* wrote that “the record is devoid of any evidence that a query of a search engine before the critical date, *using any combination of search words*, would have led to [the document] appearing in the search results.”⁸⁹ Publishers of massive online AI-generated disclosure databases could argue that this means that anything published and findable with a search engine query, no matter how difficult that query might be to construct, is prior art.

In addition, it would be a simple matter to prove that all the content in even a massive AI-generated preemptive disclosure database is findable given the right search query. The database publisher might even choose to provide this proof preemptively, to attempt to foreclose arguments over whether the content is findable. The publisher could accomplish this by building and publishing a companion database of internet search queries and responses corresponding to all the specific disclosures in the preemptive disclosure database. One would not need to wait long after the preemptive disclosure database was posted to construct this table of search queries. Online content is not immediately indexed following its posting, but the indexing occurs quickly relative to the time scales involved in the patent process. Google suggests that indexing for its search engine often occurs within a time scale of weeks, and indexing (e.g., in the case of articles in major publications) can often occur much faster.⁹⁰

With respect to the prominent forum test, publishers of massive online AI-generated disclosure databases could argue that, in the context of patent applications, those sites will become prominent forums and therefore known to a POSITA. As the Manual of Patent

88. See *Blue Calypso*, 815 F.3d. at 1348–49. Search technology has continuously improved over recent decades. See, e.g., *History of Google Algorithm Updates*, SEARCH ENGINE J., <https://www.searchenginejournal.com/google-algorithm-history/> [<https://perma.cc/S5WA-PU2R>] (last visited Feb. 4, 2024).

89. *Blue Calypso*, 815 F.3d. at 1350 (emphasis added).

90. *Why Is My Page Missing from Google Search?*, GOOGLE, <https://support.google.com/webmasters/answer/7474347?hl>, [<https://perma.cc/6QCH-ZFU3>] (last visited Feb. 4, 2024). The author has observed that Google search indexing often occurs very quickly (hours or faster) for articles published in major venues such as the New York Times and Wall Street Journal.

Examining Procedure (MPEP) explains, “[a] person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the relevant time.”⁹¹ It is not necessary to show that a particular patent applicant was aware of preemptive disclosure databases, but rather that the POSITA—who, again, is hypothetical—would know of such databases.⁹² The POSITA (so the argument would go) would also know all the relevant disclosures they contain, regardless of the fact that most of that content is irrelevant, nonsensical, and lacks any coherent organization.

Relatedly, the wide availability of AI raises important considerations regarding obviousness, which the PTO and courts assess from the perspective of a POSITA.⁹³ Historically, it was not possible for any actual person to know the entire corpus of prior art. With AI-assisted search techniques, an aspiring inventor can access much of this corpus. As Ryan Abbott has written, “[u]nlike the skilled person, the inventive machine is capable of innovation and considering the entire universe of prior art.”⁹⁴

That capability creates interesting broader questions related to the potential role of AI in reshaping the concept of a POSITA. For example, by giving inventors a much more powerful tool to discover the prior art, does AI raise the bar regarding the knowledge of a POSITA, and therefore render more inventions obvious? Or, since a POSITA already is presumed to know all the prior art, does AI instead help close the gap between the POSITA as a construct and the specific knowledge any particular person of ordinary skill working in the relevant field would possess? The latter interpretation seems preferable. After all, the alternative, which would mean continuously redefining a POSITA as a function of the latest AI-powered search technology, would raise challenges. Since new AI-powered search technology will emerge quickly, and initially the most advanced tools may be costly and available only to a small subset of people, pegging the definition of a POSITA to technology accessible only to a small number of people is clearly problematic.

4. “Otherwise Available to the Public”

Section 102 precludes patentability if “the claimed invention was patented, described in a printed publication, or in public use, on

91. MPEP, *supra* note 40, § 2141.03.

92. *See id.* This follows from the presumptive knowledge of a hypothetical POSITA.

93. 35 U.S.C. § 103 (requiring that inventions must be non-obvious “to a person having ordinary skill in the art”).

94. Ryan Abbott, *Everything is Obvious*, 66 UCLA L. REV. 2, 2 (2019).

sale, or otherwise available to the public before the effective filing date of the claimed invention” (emphasis added).⁹⁵ The AIA added the phrase “otherwise available to the public,” and its inclusion must encompass at least some inventions that would not be prior art under any of the other enumerated categories (inventions that were patented, described in a printed publication, in public use, on sale before the relevant date).⁹⁶

However, the scope of what the MPEP describes as this “new additional category of potential prior art” is unclear.⁹⁷ Case law regarding this phrase is very limited. In 2019, the US Supreme Court in *Helsinn Healthcare v. Teva Pharmaceuticals* wrote that “otherwise available to the public” captures material that does not fit neatly into the statute’s enumerated categories but is nevertheless meant to be covered.⁹⁸ That statement, however, does not state what those non-enumerated categories might be.

Since printed publications *are* otherwise accounted for in § 102(a), whatever “otherwise available to the public” might mean, as a matter of statutory construction it is clearly not intended to replace or subsume “printed publication.”⁹⁹ Put another way, the inclusion of this new language in the statute should not be a basis to conclude that *anything* posted on the internet is by definition prior art, regardless of how difficult it may be to locate. That logic would lead to absurd consequences, such as deeming content posted on the internet for only a day, or an hour, to be “available to the public.” Such an outcome cannot have been the intent of Congress in enacting the AIA.

III. FLOODING THE PTO WITH AI-GENERATED PATENT APPLICATIONS

This Article now turns to the issue of using generative AI to flood the PTO with patent filings, either in the form of provisional or utility patent applications. In contrast with AI-generated preemptive prior art disclosures, which are intended primarily to *preclude* patentability, AI-generated patent applications are intended primarily to *obtain*

95. 35 U.S.C. § 102(a)(1).

96. *Comparison of Selected Sections of Pre-AIA and AIA U.S. Patent Law*, *supra* note 65.

97. *See* MPEP, *supra* note 40, § 2152.02(e).

98. *Helsinn Healthcare S.A. v. Teva Pharm. USA, Inc.*, 139 S. Ct. 628, 634 (2019).

99. *See, e.g., Inhabitants of the Township of Montclair v. Ramsdell*, 107 U.S. 147, 152 (1883) (“It is the duty of the court to give effect, if possible, to every clause and word of a statute, avoiding, if it may be, any construction which implies that the legislature was ignorant of the meaning of the language it employed.”).

patents.¹⁰⁰ Another difference is that while preemptive disclosures are intended to preclude patentability not only for what they disclose but also for what they render obvious, patent applications can at best secure rights only to what they disclose.¹⁰¹

Unlike publishing an online database of preemptive disclosures, filing an application with the PTO requires payment of a filing fee.¹⁰² For utility filings, additional fees are due during the examination process.¹⁰³ In combination, these fees will play an important role in shaping the incentives for people seeking to use generative AI to flood the PTO with applications.

While the PTO charges some fees to everyone who obtains an issued patent,¹⁰⁴ other fees (e.g., fees associated with extension for response, submission of an Information Disclosure Statement, non-electronic filing)¹⁰⁵ may arise in association with any particular utility application. In addition, the PTO identifies three entity sizes, each of which is associated with a different fee schedule: small, micro, and large.¹⁰⁶ A further wrinkle is that “small” entities are not necessarily small in the literal sense, as this category also includes nonprofits, such as large research universities with tens of thousands of employees.¹⁰⁷

This discussion of patent application length will focus initially on the incentives arising from the fees for filing and for large size, measured in “sheets.” A sheet corresponds to one side of a single sheet of paper.¹⁰⁸ These fees pertain to both provisional and utility applications. In relation to utility applications, the discussion will also consider the impact of other fees, such as those assessed for search, examination, and issue.

100. Of course, patent applications can also preclude patentability for people other than the applicants. *See* § 102.

101. *See* 35 U.S.C. § 112(a) (requiring that “specification shall contain a written description of the invention”).

102. 37 C.F.R. § 1.16 (2023).

103. Many of the fees including for provisional application filing, utility application filing, search, examination, issue and publication, extension of time, maintenance, and miscellaneous fees (e.g., request for prioritized examination) are codified at 37 C.F.R. §§ 1.16–1.29. There are also additional sections of the C.F.R. that address other fee categories, such as patent trial and appeal fees in 37 C.F.R. §§ 41–42 and national stage PCT fees in 37 C.F.R. § 1.492.

104. *See* § 1.16. Fees in this category include the utility filing fee, the search fee, and the examination fee. *USPTO Fee Schedule*, USPTO, <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule> [<https://perma.cc/FGE4-NT4B>] (Jan. 17, 2024).

105. §§ 1.16(t), 1.17(a), (p).

106. §§ 1.27, 1.29.

107. § 1.27(a)(3)(ii)(A).

108. *See* § 1.173; *see, e.g.*, MPEP, *supra* note 40, § 607 (II) (explaining that the size fee applies to “any application . . . the specification (including claims) and drawings of which exceed 100 sheets of paper”).

Sheets are not the only metric of application size that can impact fees. For utility applications, additional fees attach for the fourth and further independent claims,¹⁰⁹ and for each claim in excess of twenty.¹¹⁰ However, the number of sheets is a better proxy than the number of claims for the amount of disclosure in a filing.¹¹¹ This is because patent claims must have support in the specification.¹¹² A patent can claim less than a specification discloses, but a claim for which there is no corresponding written description support in the specification is invalid.¹¹³

A. Flooding the PTO With AI-Generated Provisional Applications

Professional fees paid to a patent attorney or patent agent, rather than PTO fees, typically constitute the largest fraction of the overall costs in drafting and filing a provisional (or utility) application.¹¹⁴ However, persons wishing to game the system by submitting very large numbers of generative-AI-written provisional applications may conclude that they can automate much of the drafting and filing process, thereby ensuring very low professional fees. To further advance the goal of cost reduction, they might add to their team patent agents or attorneys to avoid the need to retain people with those skills externally. When patent applicants use generative AI in this manner, the dominant costs may be PTO fees, not professional fees.

Applicants who simultaneously file a large number of AI-generated provisional applications create an enormous set of combinatorial options. To claim priority to an earlier-filed provisional application, a utility application must be filed “not later than 12 months after the date on which the provisional application was filed and if it contains or is amended to contain a specific reference to the provisional application.”¹¹⁵ In addition, a single utility application can claim priority to *multiple* provisional applications, provided that all were filed

109. § 1.16(h).

110. § 1.16(i).

111. Among other reasons, this follows from the fact that the disclosure must support all the claims. See MPEP, *supra* note 40, § 2163.

112. The “written description” requirement is provided in 35 U.S.C. § 112(a).

113. See, e.g., MPEP, *supra* note 40, § 2163 (explaining that “the written description requirement prevents an applicant from claiming subject matter that was not adequately described in the specification”).

114. See *infra* Section III.B regarding the American Intellectual Property Law Association’s “Report of the Economic Survey 2021,” which reported that the costs for preparing and filing a patent application are typically many thousands of dollars.

115. Patents, 35 U.S.C. § 119(e)(1). There is an exception if the 12-month date falls on a weekend or on a federal holiday. § 119(e)(3).

within the previous twelve months.¹¹⁶ Furthermore, provided the twelve-month and other associated requirements are satisfied, multiple utility applications can claim priority to the same one or more provisional filings.¹¹⁷

1. Incentives to File Many Simultaneous Provisional Applications

As Table 1 below makes clear, to get more than 100 sheets of disclosure on file, it is less expensive to file multiple simultaneous smaller provisional applications as opposed to placing the same information in a single provisional filing.

Table 1: PTO Provisional Filing Fees as of April 2024¹¹⁸

	Micro entity	Small entity	Large (i.e., neither small nor micro)
Provisional filing fee	\$60	\$120	\$300
Size fee (if >100 sheets, for each additional 50 sheets or fraction thereof). This size fee applies to both provisional and utility filings.	\$84	\$168	\$420

For instance, using April 2024 fee rates for a small entity, a single 200-sheet provisional filing would cost \$456, while two separate simultaneous filings each with length one hundred sheets would cost

116. 37 C.F.R. § 1.78(a) (“An applicant in a nonprovisional application . . . may claim the benefit of *one or more prior-filed provisional applications* under the conditions set forth in 35 U.S.C. 119(e) and this section.”) (emphasis added).

117. *Id.* The language states that “[a]n applicant in a nonprovisional application . . . may claim the benefit of one or more prior-filed provisional applications.” *Id.* (emphasis added). There is nothing in this language limiting an applicant to no more than one nonprovisional application claiming these priority benefits. *See id.*

118. Patents, Trademarks, and Copyrights, 37 C.F.R. §§ 1.16(d) (provisional filing fee), (s) (size fee) (2024).

\$240. This corresponds to a savings of 47 percent, or \$216 in absolute dollar terms. This means the minimum cost per sheet for a filing of one hundred sheets or fewer is \$1.20, while the minimum marginal cost per sheet after the first one hundred sheets is \$3.36.¹¹⁹ Analogous effects occur in relation to provisional filing fees for micro and large entities.¹²⁰

One interesting question concerns the extent to which splitting a disclosure across multiple provisional filings might undermine patentability of a later application claiming priority to more than one of the provisional filings. An applicant who is careful to ensure that each individual provisional application has a compliant specification and drawing would assert that nothing in the Patent Act or the associated implementing regulations places a numerical limit on the number of provisional applications to which a utility application claims priority.¹²¹ Assuming that applicants file all provisional applications on the same date, they would further assert that, for priority date purposes, what matters is the combined disclosure, not the disclosure within any less-than-complete subset of the provisional applications. But as the number of provisional filings involved gets larger, the strength of that argument grows weaker, as this Article discusses next.

2. What About Conception?

Provisional filings written using generative AI, without a nexus to conception, should not be a legitimate basis for a priority claim. The purpose of a provisional filing (or a combination of multiple filings) is to

119. These minimums occur when filing maximum number of sheets allowed under that category. For example, for a small entity, a patent filing of exactly 100 sheets will cost \$120, or \$1.20 per sheet. Beyond 100 sheets, it is least expensive on a per sheet basis to file an additional number of sheets that is a multiple of fifty, in which case the per-sheet cost for the extra sheets would be $\$168/50 = \3.36 . *See id.*

120. For example, for a micro entity, a single 200-sheet provisional filing would cost \$228, while two separate simultaneous filings each with length one hundred sheets would cost \$120. For a large entity, a single 200-sheet provisional filing would cost \$1140, while two separate simultaneous filings each with length one hundred sheets would cost \$600.

121. While a provisional application should include a drawing, whether a drawing is required is an interesting question. 35 U.S.C. § 111(b)(1) states that a provisional application “shall include—(A) a specification as prescribed by section 112(a); and (B) a drawing as prescribed by section 113.” (emphasis added). However, 35 U.S.C. § 113 states that “[t]he applicant shall furnish a drawing *where necessary* for the understanding of the subject matter sought to be patented.” (emphasis added). The “where necessary” language indicates that there can be circumstances where a drawing is not necessary. *Id.* But then there is 37 C.F.R. § 1.83(a), which states that “[t]he drawing in a nonprovisional application must show every feature of the invention specified in the claims.”

document an invention.¹²² For an invention, there must be conception, which in turn must occur in the mind of a human.

“Conception” is not defined in the Patent Act. Rather, the definition the Federal Circuit (and before that, the Court of Customs and Patent Appeals¹²³) has used comes from William C. Robinson’s 1890 treatise *The Law of Patents for Useful Inventions*.¹²⁴ Conception is “the formation, in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.”¹²⁵

A person who uses AI to generate and then file five hundred separate 100-sheet provisional applications on the same day, and eleven months later files a utility application claiming priority to ten of those applications, has not evidenced conception. It would strain credulity to assert that the person had conceived of the invention allegedly disclosed by the combination of those particular ten applications as of the filing date the five hundred provisional applications.

After-the-fact harvesting of patentable subject matter from massive numbers of earlier-filed, AI-generated provisional applications should eviscerate a priority claim. The challenge lies in how to enforce this principle. It should not become the responsibility of patent examiners to preemptively scrutinize all provisional applications a utility application cites in order to validate or reject priority claims.¹²⁶

122. See § 111(b)(1)(A) (stating that a provisional application must include “a specification as prescribed by section 112(a)”).

123. See, e.g., *U.S. Court of Appeals for the Federal Circuit*, LIBR. OF CONG., <https://guides.loc.gov/papers-of-federal-judges/appeals-federal> [<https://perma.cc/9W4G-CE4E>] (last visited Feb. 5, 2024) (explaining that “Under Article III of the Constitution, on October 1, 1982, the court formally known as the United States Court of Customs and Patent Appeals, became the United States Court of Appeals for the Federal Circuit”).

124. See WILLIAM C. ROBINSON, *THE LAW OF PATENTS FOR USEFUL INVENTIONS* 532 (vol. 1 1890); see, e.g., *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986).

125. ROBINSON, *supra* note 124. This definition of conception has been cited many times by the Federal Circuit (and prior to that, by the Court of Customs and Patent Appeals), including as recently as 2021. See, e.g., *Bio-Rad Lab’s., Inc. v. Int’l Trade Comm’n*, 996 F.3d 1302, 1318 (Fed. Cir. 2021).

126. The issue of the sufficiency of disclosure in a provisional application can sometimes arise in prosecution. If the examiner cites an intervening reference as a basis for a rejection (e.g., a publication occurring after the provisional filing date but before the filing date of the associated utility application), then the question of whether the provisional contains sufficient disclosure needs to be resolved as part of the examination process. See generally MPEP, *supra* note 40, § 211.05.

3. Limiting the Number of Provisionals in Priority Claims

One indirect, though imperfect, solution is to limit the number of provisional applications to which a utility application can claim priority. The PTO could use the rulemaking process to modify 37 C.F.R. § 1.78 (coordinated as necessary with statutory changes Congress could make to the language of 35 U.S.C. § 119(e)), instituting a cap on the number of provisional filings to which any single utility application can claim priority.¹²⁷ In doing so, it would be important to avoid impacting inventors who have legitimate reasons for claiming priority to multiple provisional applications.

In such contexts completely unrelated to generative AI, an inventor might file a provisional application in January, another in March, and another in June, and then file a utility application in December claiming priority to all three provisionals. To take another example, an inventor could file a continuation-in-part application claiming priority to one or more recently filed provisionals as well as to an earlier-filed utility application, which itself might claim priority to several provisionals.¹²⁸

Any change to the regulations would need to avoid undermining these generally innocuous uses of provisional applications. For example, as the PTO explains, “[a] provisional patent application allows you to file without a formal patent claim, oath or declaration, or any information disclosure (prior art) statement.”¹²⁹ A provisional application can provide an important mechanism for an inventor who does not yet have sufficient funding to pay an attorney or patent agent to draft a set of claims. The inventor can then obtain more funding after filing the provisional application, and then, within one year after the provisional filing, file a utility application that claims priority to the provisional filing.

It would therefore be helpful to conduct a study of recent patent applications. Such a study could randomly sample a sufficient size and field of art diversity to gather statistics regarding the fraction of utility applications that claim priority to one more provisional filings, either directly or indirectly (e.g., through continuations and continuations-in-part). With those statistics, it would then be possible to identify a limit on the number of provisionals that would have minimal impact outside

127. See generally 37 C.F.R. § 1.78 (2015).

128. A continuation-in-part is an application that combines information disclosed in a prior application with new information. See 37 C.F.R. § 1.53(b) (stating that a continuation-in-part “may disclose and claim subject matter not disclosed in the prior application”).

129. *Provisional Application for Patent*, USPTO, <https://www.uspto.gov/patents/basics/apply/provisional-application> [<https://perma.cc/56E3-2EET>] (last visited Feb. 5, 2024).

the context of misuses of generative AI to flood the PTO with provisional filings.

To avoid due process problems, this rule change would need to apply only to future filings; it could not in any way limit priority claims to already-filed provisionals. As Chemerinsky has explained, procedural due process “concerns whether the government has followed adequate procedures in taking away a person’s life, liberty or property.”¹³⁰ Patents are a form of intellectual property, and thus implicate property rights and therefore due process in the procedures the PTO uses in evaluating patent applications.¹³¹ Patent applicants who begin the application process prior to a PTO rule change should be able to reasonably rely on the presumption that the PTO will not retroactively change the rules applying to their applications. The PTO would thus need to provide sufficient notice in advance of the rule change, thereby ensuring that it applies only to applicants initiating their applications after the notice.

4. Reconsidering the Fee Incentives for Provisional Applications

As discussed above, in using the provisional application process to quickly file thousands of AI-generated sheets of disclosure, the cost incentives favor submitting many simultaneous sub-100-sheet filings instead of a single, larger filing with the same total number of sheets.

To address this incentive, it is clearly not acceptable to raise the provisional filing fee, as that would increase the financial barriers facing many inventors. That leaves lowering the size fee as the only option. It would be unwise to lower the size fee for applications that are in the low hundreds of sheets range, both because of the negative revenue consequences for the PTO and because the steep per-sheet increase that kicks in after 100 sheets incentivizes limiting filing size.

But there are good reasons for considering lowering the size fee once application size significantly exceeds 100 sheets. Above that second threshold (which should be determined based on statistics from recent years regarding provisional filings with greater than 100 sheets), the size fee could be lowered so that per sheet cost could drop to slightly below that of filing a separate provisional.

130. Erwin Chemerinsky, *Procedural Due Process Claims*, 16 *TOURO L. REV.* 871, 871 (2016).

131. The Federal Circuit has found that due process protections apply in the context of patent prosecution. See *Hyatt v. Hirshfeld*, 998 F.3d 1347, 1351 (Fed. Cir. 2021) (applying the “principles of fairness and due process” in a case involving the actions of the PTO in relation to patent applications).

One obvious criticism of this approach is that it would reduce costs for the very people who are most likely to misuse the patent system by leveraging the provisional system to file massive amounts of AI-generated provisional disclosures. However, if individuals are going to game the system in that manner, it is better for the PTO and the public to know that this is occurring.¹³² That knowledge will be easier to acquire if the number of provisional applications filed is smaller, even though their length might be greater. The PTO could then perform internal studies of long provisional filings, including examining the role of generative AI in the writing process and the manner in which applicants later rely on those provisionals to support claims in later-filed utility applications. The PTO could use the results of those studies to then facilitate policy discussions regarding the role of generated AI in this context.

5. Failure to Satisfy the Written Description and Enablement Requirements?

AI-generated provisional applications may fail to satisfy 35 U.S.C. § 112(a), which provides:

[t]he specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.¹³³

This statutory text provides three different requirements: (1) the written description requirement, (2) the enablement requirement (expressed through the language mandating disclosure of “the manner and process of making and using” the invention), and (3) the best mode requirement.¹³⁴ These requirements are most frequently considered in relation to utility applications, but they also apply to provisional applications.¹³⁵ Thus, a provisional application must not only provide a “written description of the invention, and of the manner and process of

132. While the PTO knows the exact number of provisional applications that any given entity files, the public will not have full access to this information. The filing of a provisional application in and of itself does not trigger a later publication of that application. *See* 35 U.S.C. § 122. However, if a provisional application is cited as the basis for a priority claim in a utility application, and there is no non-publication request pursuant to 37 CFR § 1.213(a), then, subject to some exceptions, the provisional application will generally be made publicly accessible eighteen months after the priority date claimed in the utility application. *See* MPEP, *supra* note 40, § 1120.

133. 35 U.S.C. § 112(a).

134. *Id.*

135. *See* 35 U.S.C. § 111(b)(1) (“A provisional application “shall include—(A) a specification as prescribed by section 112(a) . . .”).

making and using it,” but also must do so in “full, clear, concise, and exact terms,” enabling a POSITA to make and use the invention.¹³⁶

By definition, large quantities of AI-generated disclosures conveyed through provisional applications are not concise. Even the combination of a carefully selected handful of generative-AI-written provisional filings drawn from a pool of hundreds will often fail to be “clear, concise, and exact.”¹³⁷ In relation to litigation, licensing, or other circumstances where the validity or value of an issued patent is tied to the strength of the priority claim to one or more earlier-filed AI-generated provisional applications, the extent of compliance with the written description and enablement requirements at the provisional stage will be an important area of inquiry.

B. Generative AI and Utility Applications

For financial and quality-control reasons, it would be difficult to largely automate the process of prosecuting a massive number of AI-written utility applications. Given the scrutiny that utility applications will undergo in the examination process, there is a strong incentive to ensure substantive attorney or patent agent involvement when drafting the specifications, drawings, and claims. In addition, after filing, human involvement is necessary for tasks such as amending claims and writing arguments in response to office actions and, if applicable, for conducting Examiner interviews.

According to the American Intellectual Property Law Association’s “Report of the Economic Survey 2021,” the median cost to prepare and file an original utility application of minimal complexity is \$7,500.¹³⁸ For relatively complex applications in the biotech, chemical, electrical, computer, and mechanical fields, the medians are about \$10,000.¹³⁹ For application amendment and the accompanying argument, the medians range from \$2,000 in the case of minimal complexity to \$3,500 in the case of relatively complex biotech and chemical patents.¹⁴⁰

136. § 112(a).

137. *See id.*

138. *2021 Report of the Economic Survey*, AIPLA, <https://www.aipla.org/detail/journal-issue/2021-report-of-the-economic-survey> [<https://perma.cc/ZXX4-XUSG>] (last visited Feb. 6, 2024). Minimal complexity is identified in the table on this page as “e.g., 10 page specification, 10 claims.” *Id.*

139. *Id.* at 48. The reported medians are \$10,250 for biotech/chemical and \$10,000 for both electrical/computer and mechanical. *Id.*

140. *Id.* For application amendment/argument, the median is \$3,000 for electrical/computer and \$2,800 for mechanical. *Id.*

Applicants can use generative AI to help speed the process and reduce the cost of drafting applications as well as amendments and applicant arguments after an office action. But as impressive as current and emerging generative AI is, it seems likely that a significant amount of attorney or patent agent time, and thus cost, will still be required to navigate the patent prosecution process. The costs of that time will be in addition to the PTO fees associated with obtaining a patent, some of which are listed in Table 2 below.

Table 2: Selected USPTO Utility Patent Fees as of April 2024¹⁴¹

	Micro entity	Small entity	Large (i.e., neither small nor micro)
Utility filing fee (except design/plant)	\$64	\$128 or \$64 ¹⁴²	\$320
Size fee (if >100 sheets, for each additional 50 sheets or fraction thereof). This size fee applies to both provisional and utility filings.	\$84	\$168	\$420
Search fee	\$140	\$280	\$700
Examination fee	\$160	\$320	\$800
Issue fee	\$240	\$480	\$1200

141. The numbers in the table come from 37 C.F.R. §§ 1.16(a) (utility filing fee), (s) (size fee), (k) (search fee), (o) (examination fee), 1.18(a) (issue fee).

142. As noted in the USPTO’s Fee Transmittal form, “The \$128 small entity filing fee for a utility application is further reduced to \$64 for a small entity applicant who files the application via Patent Center or EFS-Web.” See *Fee Transmittal*, USPTO, <https://www.uspto.gov/sites/default/files/documents/sb0017.pdf> [<https://perma.cc/83E4-FHMM>] (last visited Feb. 5, 2024). The fees listed in the table are not intended to be exhaustive, as there are many possible additional fees as well. See generally 37 C.F.R. §§ 1.16–1.29.

The combination of attorney or patent agent costs (even when reduced significantly through generative AI drafting assistance) plus PTO fees means that obtaining an issued patent will still be a multi-thousand-dollar proposition. For an entity filing hundreds or thousands of utility applications, the costs would multiply accordingly. While the resulting multimillion-dollar outlays would be prohibitive for most individuals and small businesses, they would be well within the reach of large companies, hedge funds, or consortia of wealthy investors.

With those costs in mind, several business models could facilitate exploitation of generative AI in patent prosecution. All the business models described below operate under the principle of a funnel, starting with large numbers of AI-written provisional or utility applications and ending with a relatively much smaller number of issued patents. The models differ only in the timing of a marketing and sales process.

1. Sales Before Utility Filings

An entity can simultaneously file a large number of AI-generated provisional applications and then immediately start marketing those filings. The pitch would be along the lines of: “By filing so many simultaneous provisional applications, we have created a unique, one-year window to file utility applications enabling you to obtain valuable patents in a particular field of endeavor. We are offering to sell you the rights these provisional filings create. And we will promise that the named inventors on the provisional filings will be engaged in and supportive of the utility patent process.” It is easy to see that a large, established company might be intrigued by this sales pitch. If the company declined, it might see the portfolio sold to one of its competitors. Even if it thought a large fraction of the content of the provisional filings was of low quality, the volume would often ensure that at least some high-quality content would make a transaction worthwhile. The selling entity might seek to sell the entire portfolio to a single buyer. Or it might allow different buyers to pick and choose which portions of the portfolio to purchase.

At the start of the one-year window triggered by the filing of provisional applications, time would act in the selling entity’s favor. Potential buyers would know that with each passing month, their own window to draft and file utility applications would diminish. This would provide an incentive for buyers to close a deal quickly. With the passage of time, however, the incentives would shift. If the selling entity was not able to conclude a sale after several months, buyers would have improved leverage to demand a lower price, as the value of the option

the provisional filings create would have declined. Moreover, as the one-year expiration approached, the value of any provisional applications for which the rights had not been sold off would approach (and at the one-year mark, reach) zero.

2. Sales After Utility Filings But Before Patent Issuance

An alternative approach would be for the entity that filed the large number of AI-generated provisional applications to itself do the substantial amount of work to identify inventions, and then draft and file a portfolio of utility applications based on the best combinations of the provisional applications. Immediately after filing the utility applications, the entity would subsequently market the portfolio. The price would be higher, but if the entity was thorough and careful in drafting the utility applications, potential purchasers could consider the rights to those applications valuable because the seller has already undertaken the burden of combing through the provisional filings to identify the most valuable content.

This portfolio could be valuable not only because of the specific inventions the utility applications would claim, but also because those filings create an opportunity to file future continuation applications containing claims to additional inventions.¹⁴³ This would enable a buyer to file new applications while maintaining the original priority date, provided that the corresponding specifications supported the claims.

In fact, potential buyers might view the opportunity for filing continuation applications as one of the most attractive aspects of the purchase. To maximize this opportunity, the selling entity would be careful to include in the specifications of the utility applications material sufficient not only to support the claims in those utility applications, but also additional material that could support new claims filed later through continuation applications. Of course, it would also be necessary to ensure that the provisional applications cited in the utility filings contained at least the same breadth of disclosure. In short, generative AI creates a multiplicity of options for using the provisional application process to attempt to capture patent rights.

A variant on this model would be for an entity to skip the provisional filing process altogether and instead to use AI to generate and then file many utility applications. This approach has the

143. See 35 U.S.C. § 120; see also 37 C.F.R. § 1.78(d); MPEP, *supra* note 40, § 201.02. Continuation applications receive the benefit of the filing date of the original application for which they are continuations. By contrast, continuation-in-part applications contain new matter, and with respect to claims relying on the new matter, do not receive the benefit of the original filing date. See *id.* § 201.08.

disadvantage of delaying the priority date, since the entity's harvesting of high-quality disclosures from the AI-generated material would occur before establishing a priority date through a PTO filing. However, it has the advantage of avoiding the vulnerabilities of filing utility applications that each cite to multiple provisionals.¹⁴⁴

3. Using Generative AI to Build a Patent Portfolio

A third approach is for an entity to take the process all the way to the finish line. This would entail the entity simultaneously filing enormous numbers of AI-generated provisional applications in one or more subject areas, using the subsequent year to draft and file a set of utility applications claiming priority to subsets of those provisionals, and seeing those utility applications through to issued patents. While this is by far the most expensive and time-consuming path, it would be well within reach for a well-funded entity taking a long-term view on investment return. It is easy to imagine that a large, established company, or a venture- or hedge-fund-backed startup entity created specifically for this purpose might have access to many millions of dollars in funding and a multiyear runway for generating results.

A complication of this business model is that the prosecution process would proceed at a range of different speeds for different applications due to factors including variations in the timing, nature, and number of office actions. But in return for the cost and many years of effort, the entity pursuing these filings would expect to be rewarded with a large and potentially valuable portfolio of issued patents, which it could then seek to monetize through some combination of sales, licensing, and litigation.

As is clear from the foregoing, generative AI can game the patent system in ways that would have been hard to imagine in a pre-generative-AI era. Fortunately, a set of countermeasures are available to counteract these anti-innovative uses of generative AI.

4. Countermeasures

The best way to address the anti-innovative business models described above is through the underlying weakness that will be

144. If a utility application that claims priority to a large number of provisionals matures into a patent that is then asserted in litigation, the defendant could seek to show that the purported inventors did not conceive the claimed invention at the time of the provisional filings. The defendant might argue that there was insufficient support for the assertion that, as of the filing date of the provisionals, the inventors had in mind the specific way of combining the information from different provisionals in the manner reflected in the claims of the later-filed utility application. *See generally id.* § 2107.

present in many AI-written patent applications. The entire proposition rests on the quality of the AI-generated provisional applications at the broad opening of a funnel that starts with a large amount of AI-written content submitted to the PTO through provisional or utility applications. Those applications would be voluminous, but they would typically have major quality defects, and even the best of them would often lack the coherence required to establish conception.¹⁴⁵ Furthermore, as noted previously, insufficiencies would often persist in relation to written description and enablement. A patent portfolio built in this manner would be vulnerable to attack if its owners asserted the patents through litigation or threatened to initiate litigation. A third party could attack the validity of the patent claims at issue through filing Inter Partes Reviews with the PTO, as well as through litigation either as a defendant in a patent lawsuit or as a plaintiff by initiating a declaratory judgment action.¹⁴⁶

It is easy to imagine that the discovery process in litigation could be challenging for the patent owners and purported inventors. For instance, a person who is a named inventor on hundreds of simultaneously filed patent applications would have a hard time credibly testifying in an inventor deposition regarding the details of how one particular invention in that collection was conceived. A purported inventor may also face questions regarding the accuracy of the oath they signed when submitting the utility applications. The awareness of these dynamics would help chill attempts to misuse the patent system in this manner, or, at the very least, lower the value of the patents obtained through misuses of generative AI.

In addition to these market-based correctives, it is important to consider whether any legislative or regulatory solutions might be appropriate. The challenge with a legislative or regulatory solution would be that the same transactions that are problematic in the business models described above are common and innocuous in other contexts. It is routine for inventors (or companies to which the inventors have assigned inventions) to license or sell rights to their patents at

145. See ROBINSON, *supra* note 124.

146. For a description of the Inter Partes Review process, see *Inter Partes Review*, USPTO, <https://www.uspto.gov/patents/ptab/trials/inter-partes-review> [<https://perma.cc/JJ47-BFR2>] (last visited Feb. 5, 2024). With respect to seeking to establish invalidity through a declaratory judgment, see, e.g., John C. Paul & D. Brian Kacedon, *Declaratory Judgment Action Challenging Patent Validity and Infringement Was Dismissed Despite a Patent Owner's Statement that the Plaintiff's Product May Infringe Certain Patents*, FINNEGAN (May 16, 2011), <https://www.finnegan.com/en/insights/articles/declaratory-judgment-action-challenging-patent-validity-and.html> [<https://perma.cc/89Z8-93X9>] (“When a party is threatened with a patent infringement lawsuit, it may preemptively sue the patent owner in a declaratory judgment action and seek to have the patent declared invalid or not infringed.”).

various stages of the patenting process. Any legislative solution would need to avoid creating collateral damage regarding routine patent transactions.

There is also a question of whether some of the behaviors that may accompany these strategies might involve “egregious misconduct.” As the Federal Circuit wrote in 2013 in *Therasense v. Becton, Dickinson & Co.*, “[w]hen the patentee has engaged in affirmative acts of egregious misconduct, such as the filing of an unmistakably false affidavit, the misconduct is material.”¹⁴⁷ For instance, a person who claims to be an inventor on an AI-written patent application despite not having read or understood the application would be exposed to a claim of egregious misconduct.

A finding that this had indeed occurred, if established in litigation, would render the associated patent unenforceable. As a policy response, it is worth considering whether this finding should also render patents arising from other contemporaneously filed applications naming the same inventor unenforceable. This has some support in *Therasense*, in which the court wrote that “the 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.”¹⁴⁸ This supports the position that a court could invalidate other patents arising from applications that the inventor filed concurrently.

The question would then be how wide the circle of unenforceability would spread. Of course, anticipating this potential issue, entities filing massive numbers of AI-generated applications might be careful to have the inventors take steps to reduce the chances of—and potential harms from—a misconduct finding. These steps could include (1) ensuring that all named inventors have a substantive understanding of all the applications on which they are named inventors before they are filed, and (2) limiting the number of applications associated with each inventor to limit the damage to the portfolio if that inventor is found to have engaged in misconduct.

In the end, the boundaries of what constitutes an acceptable use of generative AI in writing patent applications will likely be established through the courts. Hopefully, the courts will help ensure that human knowledge remains at the core of the patent system. Generative AI can be a powerful tool to improve knowledge dissemination, but it should not be allowed to broaden inventorship to encompass AI-written patent

147. 649 F.3d 1276, 1292 (Fed. Cir. 2011) (en banc).

148. *Id.* at 1288.

applications that do not reflect the knowledge of the persons named as inventors.

IV. CONCLUSION

While generative AI promises to bring an enormous number of benefits, it also creates opportunities for misuse, including in the patent context. By reducing to near zero the cost of producing text, generative AI makes it possible to produce an essentially unlimited number of documents purporting to describe inventions—despite the lack of any substantive nexus to human understanding of their contents. This opens the door to two categories of anti-innovative uses in the context of the patent system: (1) publishing massive AI-generated online databases with the goal of foreclosing patentability across broad swaths of subject matter, and (2) using generative AI to flood the PTO with provisional and utility applications.

This Article explores the methods and incentives associated with these applications of generative AI and has identified a set of associated policy and market-based responses. In combination, these responses can help ensure that the patent system stays true to what the Supreme Court has explained is its “ultimate goal . . . to bring new designs and technologies into the public domain through disclosure.”¹⁴⁹

149. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 151 (1989).