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Henry H. Perritt, Jr.

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PATENTING AN AI-GENERATED INFRINGEMENT DETECTOR

Henry H. Perritt, Jr.[1]

I. Abstract

New technologies of generative AI vastly expand the power of searches for products and services that may infringe patents. Designing such systems requires attention to the dynamics of patents and innovation, to the vast scope of potential infringers, and to the probability that any particular innovation will pose a competitive threat to a patent holder.

Existing laws allow such infringement search applications to be patented. The more interesting question is: Can an application for an infringement detector developed by AI be patented? The framework for patentability set forth in the Patent Act and specific guidance issued by the USPTO for AI inventions suggests that the answer is "yes."

The author tested this conclusion by prompting ChatGPT to draft a patent application for a generative AI enabled infringement detector. The resulting application describes a computer program that parses a patent, identifies the relevant terms and its claims, slots them into a sophisticated and deep semantic tree, and then searches sources likely to contain indicia of products and services being offered that have features that may infringe the patent. The author reviewed ChatGPT's draft of the complete patent application and then prompted ChatGPT to revise the application to provide for a more detailed specification, to include a Doctrine of Equivalents analysis, and to tie the invention more tightly to specialized hardware. The author then made minor revisions in language and organization to fix antecedent basis and specification support issues, created drawings, and submitted the application, along with a disclosure of how the author had interacted with ChatGPT in the drafting process, to the USPTO.[2]

The patent examiner raised no objection or presented no rejection based on AI's involvement in designing the invention and writing the application but ultimately issued a final rejection on 35 U.S.C. § 101 subject matter eligibility and 35 U.S.C. § 103

[1] Professor of Law Emeritus, and former dean, Chicago-Kent College of Law, Illinois Institute of Technology. Author of 25 books, including Trade Secrets for the Practitioner (3d ed. 2024), and more than 100 law review articles on labor and employment law, administrative law, law and technology, and international relations. Democratic nominee for the U.S. House of Representatives, Illinois 10th District, 2002. Former member, National Academy of Sciences Computer Science and Telecommunications Board. Member of the bar: Virginia, Pennsylvania (inactive), District of Columbia, Maryland, Illinois (retired), USPTO, and the Supreme Court of the United States. Commercial helicopter, private instrument airplane, and drone pilot. Extra-class radio amateur (K9KDF). The author holds several patents.

[2] The USPTO stands for the United States Patent and Trademark Office, which is a component of the United States Department of Commerce. 35 U.S.C. § 1(a) (establishing office).

obviousness grounds. The experiment demonstrates how inventorship can be handled in AI-human collaboration. It also shows, however, that AI generation of patent applications increase the likelihood of obviousness rejections. The subject matter selected in this experiment invited eligibility scrutiny, so the 35 U.S.C. § 101 eligibility rejection had nothing to do with the involvement of AI in the inventive process or the prosecution of the patent application.

II. Introduction

Royal Stanton and Chalmers Crane graduated from the University of Alabama together, where they were fraternity brothers in Delta Tau Delta. Royal continued for a master's degree in mechanical engineering, while Chalmers earned a JD at the law school.

Both settled in Tuscaloosa but periodically questioned whether they had made the right decisions to prepare for satisfying and successful careers. They were discussing this over a series of beers at Rounders on the Strip:

> "I should've transferred somewhere else once I decided I was interested in patent law," Chalmers said. "Alabama is ranked 33 by US News as a law school, but only 111 for patent law."
>
> "Everyone tells me the same thing," Royal said. "I should've gone to Auburn. Alabama is ranked 93 in mechanical engineering, while Auburn is ranked 57."
>
> "Go to Auburn! Blaauch! No, you shouldn't!" Chalmers exclaimed. "What a terrible idea." Chamlers flinched and looked around. "Don't let anybody hear you say that Auburn might be better than Alabama."
>
> "I should've looked for a job somewhere else anyway."
>
> "Why? Mercedes is hiring like crazy at their big plant out at Vance and in the new battery factory they just erected across the Birmingham Highway from the first one. You are always whining—ever since you were a freshman. I never should have talked the house into pledging you," Chalmers joked.
>
> "Ha! That's why I was elected to almost every office in the chapter. Don't you remember our campaign for Anax? Who won that?"
>
> "All right, all right. I'm thinking about relocating to Atlanta myself to join one of the big patent law firms there," Chalmers said.

“There aren’t any big patent law firms in Atlanta. I don't know what you're poor mouthin’ about. Didn’t you just get a patent? You told me about it last week. You were all excited.”

“I did! It's for another of our fraternity brothers, Bruce Ainsworth. He was a couple of years ahead of us. He majored in civil engineering. Got a job with a surveying firm in town and was always complaining about how construction crews run over the surveyor stakes after surveyors have done their work on a construction site. I told him he should put his book learning to work and invent something to reduce the problem.

“Considerably to my surprise, he did, and I agreed to apply for a patent for him for free. This was just before I got hired by the Rockingham, Burke firm,” Chalmers laughed. “Bruce was lucky on the timing. Rockingham, Burke would never have let me start out by doing free work. All they care about is billable hours; never mind if it is a sketchy worker's comp claim by some well-known malingerer.

“Anyway, we just received the patent last month. It moved more quickly because Bruce qualified as a micro entity under the USPTO rules,” Chalmers said.

“Ha, ha, ha! The concept of Bruce Ainsworth as a ‘micro entity’ is more than I can wrap my head around. He, he,” Royal laughed.

“It means that he—”

“So, what is it? Can you tell me?”

“Sure, I can tell you,” Chalmers said. “Patents are public. That's one of the great purposes of the patent system; to make inventions public, thereby enhancing the store of public knowledge, while protecting the economic interests of the inventor for a temporary period of 20 years.”

“I didn’t ask for a lecture on the patent system; I asked about the invention,” Royal said.

“You are so slow; I take advantage of any opportunity to pour a little knowledge into your year. The patent is for a little device that can be installed on earth moving equipment that detects an RFI chip on a surveyor stake. It calculates the distance from the piece of equipment to the stake. At a preset distance, adjustable by the manager of the

construction site, the system disables the equipment and won't let it move any closer to the stake."

"That sounds pretty neat," Royal said. "How much does it cost?"

"We built a prototype for $15,000, and Bruce estimates they can be manufactured in quantity for about fifty bucks a copy," Chalmers said.

"And there are a hell of a lot of surveyor stakes around the world."

Chalmers laughed. "You bet there are. But I'm not sure that Bruce is going to be able to retire just yet on the proceeds from his patent. I did the work for a share in the patent, and I doubt I will ever see anything."

"Why not? I would think he would have a couple of million before either of us, in any event, well before he's thirty," Royal said.

"Not if other people learn about the idea and imitate it."

"I thought you got him a patent?" Royal asked.

"I did." Chalmers said.

"Wouldn't that be patent infringement? I managed to learn something from hours of listening to you prattle on about the subject."

"Yes, it would be, if they do it in the same way that Bruce's patent describes. But finding infringers is the problem."

"Why not just do a Google search?" Royal said.

"We can, but what search terms would we use?" Chalmers said.

"You're asking me? You wrote the patent. Start with the words in the patent?"

"Like 'surveyor's stake,' 'bulldozer,' 'backhoe,' 'run over'?" Chalmers questioned. "You want to help me sort through all the results? That won't tell us with any degree of precision who is bringing products to the market with the same characteristics as the patent."

"Well, it seems like generative AI—"

> "I hoped you would say that," Chalmers said. "Do you think you could work out an AI application that would detect patent infringement?"
>
> "I don't know," Royal said thoughtfully, ordering two more beers for them. "I don't know. I'm awfully busy."
>
> "Doing what? You said you were looking for a job."
>
> "I am. That's why I'm busy."
>
> "All right, lazy thing," Chalmers joked. "No Benjamin Franklin, you."
>
> Royal took a big swallow of beer and broke into a smile. "Maybe I'll ask ChatGPT to invent it."
>
> Chalmers looked at Royal for a long moment and then said, "Good man! We might even be able to get a patent on ChatGPT's work."

The new technologies of generative AI vastly expand the power of searches that might uncover products and services that infringe patents. Designing and deploying such systems requires attention to the dynamics of patents and innovation, to the vast scope of potential infringers, and to the probability that any innovation will pose a competitive threat to a patent holder.

Existing laws allow such infringement search applications to be patented. The more interesting question is: Can an application for an infringement detector developed by AI be patented? The framework for patentability set forth in the Patent Act and specific guidance issued by the United States Patent and Trademark Office (USPTO) for AI inventions suggest that the answer is "yes." The author tested this conclusion by prompting ChatGPT to draft a patent application for a generative AI enabled infringement detector. The resulting application describes a computer program that parses a patent, identifies the relevant terms and its claims, slots them into a sophisticated and deep semantic tree, and then searches sources likely to contain indicia of products and services being offered that have features likely to infringe the patent.[3]

ChatGPT's initial draft of the complete patent application was reviewed by the author, who then prompted ChatGPT to revise the application to provide for a more detailed specification, to include a Doctrine of Equivalents analysis, and to tie the invention more tightly to specialized hardware.

[3] *See generally* System and Method for Detecting Patent Infringement U.S. Patent Application No. 18/950,464 (filed Nov. 18, 2024).

The author then made minor revisions in language and organization to the AI drafted patent application to fix antecedent basis and specification support issues, created drawings, and submitted the application to USPTO along with a disclosure of how the author had interacted with ChatGPT in the drafting process.

The patent examiner issued a first office action in the form of a non-final rejection and conducted an interview with the author at the author's request. The examiner raised no issue regarding the involvement of ChatGPT in designing the invention and writing the application. The examiner did, however, reject the claims on 35 U.S.C. § 101 grounds. Those rejections were made final on March 17th, 2025.

Following this introduction, Part III of this article provides basic background on patent law and generative AI technology. Part IV explains the problems confronting a patent owner who wishes to identify potential infringers. Part V explains how generative AI technology can help solve this problem and uses examples from the AI drafted patent application to illustrate solutions.

Part VI examines the AI drafted patent application and considers whether it constitutes patent eligible subject matter, whether it has the requisite human inventorship, and whether it is likely to be anticipated and therefore not novel under 35 U.S.C. § 102 or obvious under 35 U.S.C. § 103. This Part of this article also considers the adequacy of the AI drafted patent application description under 35 U.S.C. § 112. Part VI concludes with a description of the author's intervention in the drafting process as the author identified shortcomings and prompted ChatGPT to fix the issues.

Part VII considers the ultimate fate of the application, noting that its rejection on 35 U.S.C. § 101 eligibility grounds or 35 U.S.C. § 103 obviousness grounds did not negate its acceptance for prosecution on the merits notwithstanding the role of AI in designing the invention and writing the application. Finally a series of appendices in Part VIII present the full text of ChatGPT's drafts of the AI drafted patent application and the author's disclosure of AI involvement.

Beyond the scope of this article, but an interesting thought for future exploration, is asking ChatGPT or a similar generative AI engine to write the code for the infringement detector described in this article.

III. Background

A. Patents

The Patent and Copyright Clause of the United States Constitution authorizes the Congress to establish a patent system.[4] The first Congress did so, in the Patent Act of 1790.[5] The basic requirements to obtain a patent have changed very little in the last 235 years.[6] Only inventions relating to processes, machines, manufactures, or compositions of matter are eligible for a patent.[7] To receive a patent, an invention must be novel,[8] the invention must not be obvious,[9] and the patent application must describe the invention with sufficient clarity and specificity so that someone else skilled in the art of the invention can make and use the invention.[10]

Obviousness depends on (1) all of the elements of a patent claim being found in a plurality of prior-art references, and (2) on evidence that a skilled artisan would have a motivation to combine the teachings of the prior art references to achieve the claimed invention, and that he would have had a reasonable expectation of success in doing so.[11]

Novelty and nonobviousness depend on comparing the invention to be patented to the prior art, previous patents, published applications, public disclosures, and sales.[12] Any of these sources can potentially defeat novelty by anticipation or make the invention obvious. Even an inventor's own disclosures can be prior art and negate the inventor's

[4] U.S. CONST. art. I, § 8, cl. 8.
[5] Patent Act of 1790, ch. 7, 1 Stat. 109–12 (1790).
[6] The 1790 statute circumscribed patent eligibility to "art, manufacture, engine, machine, or device, or any improvement therein not before known or used . . . ." Patent Act of 1790, ch. 7, 1 Stat. 109–12, Sec. 1 (1790). While the current statute allows patents for any "process, machine, manufacture, or composition of matter" 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. 35 U.S.C. § 101; 35 U.S.C. § 102.
[7] 35 U.S.C. § 101.
[8] 35 U.S.C. § 102.
[9] 35 U.S.C. § 103.
[10] 35 U.S.C. § 112.
[11] ImmunoGen, Inc. v. Vidal, 653 F. Supp.3d 258, 267 (E.D. Va. 2023); *see also* MPEP § 2142 (9th ed. Rev. 01.2024, Nov. 2024) (explaining legal concept of prima facie obviousness); MPEP § 21341(III)(G) (9th ed. Rev. 01.2024, Nov. 2024) (articulating seven KSR rationales for obviousness). Interpreting *Graham v. John Deere Co*., 383 U.S. 1 (1966), the USPTO crystallized a "teaching-suggestion or motivation" ("TSM") test for obviousness. In *KSR Int'l Co. v. Telefax Inc.*, the Supreme Court reversed the Federal Circuit for taking a "rigid approach" to TSR and articulated a more flexible, multi-factor test for obviousness under section 103. KSR Int'l Co. v. Telefax Inc., 550 U.S. 398, 415 (2007). It rejected obviousness based on a simple "obvious to try." *Id.* at 419–22.
[12] 35 U.S.C. § 102(a).

entitlement to a patent.[13] Patent law, however, affords inventors a one-year grace period within which the inventor's disclosures are not disqualifying prior art.[14]

Anticipation and obviousness are distinct, yet related. Anticipation says: "Someone else already invented it." While obviousness says: "No one invented it before, but the invention is only a trivial contribution to the state of the art"—it involves "'matters of design well within the expected skill of the art and devoid of invention.'"[15] Despite the oft repeated statement that "anticipation is the epitome of obviousness," the Federal Circuit has stated that the two are distinct concepts.[16] Most significantly, "[o]bviousness can be proven by combining existing prior art references, while anticipation requires all elements of a claim to be disclosed within a single reference."[17] Additionally, secondary considerations are relevant to obviousness, but not to anticipation.[18]

To infringe a patent, an infringer need not have copied the patented invention or even known about it.[19] This distinguishes patent infringement from copyright infringement,[20] and this distinguishes patent infringement from trade secret misappropriation.[21]

Additionally, as expressed in *Regents of Univ. of Cal. v. Dako North America, Inc.*:

> Patent infringement may be proven by showing literal infringement of every limitation recited in a claim or by showing infringement under the [D]octrine of [E]quivalents. . . . Both literal infringement and infringement under the [D]octrine of [E]quivalents require an element-by-element comparison of the patented invention to the accused device. . . . When the patented invention is being compared to the accused device under the [D]octrine of [E]quivalents, the court should consider "whether a substitute element matches the function, way, and result of the claimed element, or whether the

[13] MPEP § 2133.02(I) (9th ed. Rev. 01.2024, Nov. 2024) (citing Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 148 (1989)); The USPTO's Manual of Patent Examining Procedure (MPEP) is a published guide for patent examiners and patent applicants. MPEP Foreword (9th ed. Rev. 01.2024, Nov. 2024). While it does not constitute law, it is generally regarded as an authoritative resource during patent prosecution. *Id.*

[14] 35 U.S.C. § 102(b); *see also* MPEP § 2152.02(f) (9th ed. Rev. 01.2024, Nov. 2024) (noting the disclosures by the patent applicant within the one-year grace period are not prior art); MPEP § 2153.01 (9th ed. Rev. 01.2024, Nov. 2024) (interpreting one-year grace period under 35 U.S.C. § 102(b)).

[15] Graham v. John Deere Co., 383 U.S. 1, 22–23 (1966) (quoting a patent examiner who made an obviousness rejection).

[16] Cohesive Techs., Inc. v. Waters Corp., 543 F.3d 1351, 1363–64 (Fed. Cir. 2008).

[17] *Id.* at 1364.

[18] *Id.*; *see also* MPEP § 2131.04 (9th ed. Rev. 01.2024, Nov. 2024) (explaining that secondary considerations are irrelevant to anticipation).

[19] *See* 35 U.S.C. § 271(a) ("whoever without authority makes, uses, offers to sell, or sells," has no element of knowledge or intent).

[20] *See* 17 U.S.C. § 501 (copyright infringement statute).

[21] *See* UNIF. TRADE SECRETS ACT § 1(2); Defend Trade Secrets Act, 18 U.S.C. § 1832(a) (defining trade secrets misappropriation).

> substitute element plays a role substantially different from the claimed element."[22]

Furthermore, proof of willful infringement entitles the plaintiff to treble damages.[23] To state a claim of willfulness, a plaintiff must plausibly allege that (1) the infringer had knowledge of the patent at the time of infringement and (2) the infringer deliberately infringed on the patent.[24]

One obtains a patent by applying to the USPTO.[25] The patent applicant must also pay fees up to thousands of dollars.[26] Additionally, the patent application must describe the invention in detail so that the USPTO knows that the applicant has actually invented the invention to be patented rather than just speculated about the possibility of the invention and will know the metes and bounds of the claimed invention.[27] Furthermore, the patent must contain sufficient details so that someone skilled in the relevant art can read the patent to know how to build and use the invention.[28]

Applications are reviewed and acted on, in the first instance, by professional employees of the USPTO called patent examiners.[29] Patent prosecution, as review of a patent application is known, involves an interactive process between the patent examiner and the applicant (usually the applicant's lawyer). During that process, the examiner expresses his view of legal requirements by rejecting particular claims.[30] The applicant is then afforded an opportunity either to revise the claims to make them acceptable to the examiner, to convince the examiner to change his position,[31] or to appeal the examiner's adverse determinations internally within the USPTO to the Patent Trial and Appeal Board (PTAB).[32]

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[22] Regents of Univ. of Cal. v. Dako North America, Inc., 615 F.Supp.2d 1087, 1091 (N.D. Cal. 2009) (internal citations omitted).
[23] 35 U.S.C. § 284; *see generally* Halo Elecs., Inc. v. Pulse Elecs., Inc., 579 U.S. 93 (2016) (reversing the Federal Circuit and articulating a flexible test for "egregious" infringing conduct).
[24] Longhorn Vaccines & Diagnostics, LLC v. Spectrum Sols. LLC, 564 F. Supp.3d 1126, 1134 (D. Utah 2021) (granting some and denying other motions to dismiss willful infringement claims).
[25] 35 U.S.C. § 111; 37 CFR § 1.51; *see also* MPEP § 601 (9th ed. Rev. 01.2024, Nov. 2024).
[26] 35 U.S.C. § 41 (The basic filing fee for an application for an original patent is $330. The examination fee is $220. The search fee is $540. The issue fee is $1,510. So, the total cost for obtaining a simple utility patent is $2600.).
[27] 35 U.S.C. § 112.
[28] 35 U.S.C. § 112; *see also* MPEP § 2161 (9th ed. Rev. 01.2024, Nov. 2024) (stating that section 112 has three requirements: "(A) A written description of the invention; (B) The manner and process of making and using the invention (the enablement requirement); and (C) The best mode contemplated by the inventor of carrying out his invention.").
[29] 35 U.S.C. § 131; 37 CFR § 1.104 ("Nature of examination"); *see also* MPEP §§ 701, 707 (9th ed. Rev. 01.2024, Nov. 2024).
[30] *See* MPEP ch. 700 (9th ed. Rev. 01.2024, Nov. 2024) (examination of applications).
[31] 35 U.S.C. § 132; 37 CFR § 1.104; see also MPEP § 707 (9th ed. Rev. 01.2024, Nov. 2024).
[32] 35 U.S.C. § 134; MPEP ch. 1200 (9th ed. Rev. 01.2024, Nov. 2024).

If an applicant is dissatisfied with PTAB's decision, the applicant can go to the United States district court to compel the USPTO to grant a patent,[33] or the applicant can appeal the PTAB decision to the United States Court of Appeals for the Federal Circuit.[34]

Patents last for twenty years from the effective date of the application.[35] After the 20 years, anyone is free to use the patented subject matter because it is in the public domain.[36]

Once a patent is issued, it is subject to review, amendment, or cancellation in a variety of proceedings. In a reissuance, the inventor or other owner of the patent surrenders the original patent and tries to get a new one to correct errors in the original patent.[37] In a re-examination proceeding, which may be triggered by the patent owner or a third party, the patent office considers new information that raises questions about patentability.[38] In Post-Grant Review, available for only nine months after patent issuance, anyone can challenge the validity of the patent on any ground that could have resulted in the patent's denial during the prosecution process.[39] In Inter Partes Review, anyone can challenge the validity of a patent, but on more limited grounds, offering only prior art in the form of patents or publications to raise questions about novelty and obviousness.[40] The Inter Partes Review proceeding is available nine months after issuance of the patent and until the patent expires.[41] The PTAB conducts the Post-Grant Review and Inter Partes Review proceedings.[42]

In addition to these administrative processes, United States district courts have the power to determine the validity of patents asserted in suits for infringement,[43] or in declaratory judgment actions brought by potential infringers.[44]

[33] 35 U.S.C. § 145 (authorizing civil action in district court to compel USPTO to issue a patent).
[34] 35 U.S.C. § 141.
[35] 35 U.S.C. § 154(a)(2).
[36] Singer Mfg. Co. v. June Mfg. Co., 163 U.S. 169, 185 (1896); Sears, Roebuck & Co. v. Stiffel Co., 376 U.S. 225, 230 (1964).
[37] 35 U.S.C. § 251 (authorizing reissue of "defective patents").
[38] 35 U.S.C. §§ 302–305 (authorizing re-examination).
[39] 35 U.S.C. §§ 321–329 (authorizing Post Grant Review).
[40] 35 U.S.C. §§311–319 (authorizing Inter Partes Review).
[41] 35 U.S.C. § 311(c).
[42] 35 U.S.C. § 318 (role of PTAB in deciding IPR cases); 35 U.S.C. § 328 (role of PTAB in deciding PGR cases).
[43] *See* 35 U.S.C. § 282(a).
[44] *See* Medimmune, Inc. v. Genentech, Inc., 549 U.S. 118, 126 (2007) (explaining the prerequisites to maintaining a declaratory judgment action to invalidate a patent).

B. AI

I. Put Aside the Hype

A perfect storm of politics and public relations has spawned an uproar over AI,[45] which is considerably overblown. Sam Altman's Open AI released ChatGPT as a marketing initiative aimed at enlisting a multitude of users in wringing out the shortcomings of the system.[46] Others in the industry and in the computer science profession jumped on the bandwagon of excitement about the astounding level of human-like fluency that ChatGPT displays, understanding that they can turn the excitement into investor interest and entrepreneurial opportunity.[47] But at the same time, some interest groups and identity groups, always alert to developments that might help them grab public attention for their causes, have joined the throng in warning of the technology's potential to harm this or that protected interest.[48] And then, the progressive movement, instinctively wary of big business and already championing the need to reign in big tech, has found new arguments in the perceived dangers of generative AI.[49] The press and media are lapping it all up with headline after headline. Some of them understand the technology, but not many.

AI is not going to replace good writers, actors, or attractive models.[50] It is not going to tell any more lies than human beings do.[51] It is not going to result in massive job loss; to the contrary, it's creating thousands of new jobs.[52] It certainly is not an existential threat to anything except maybe those mediocre at their crafts.

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[45] *See, e.g.*, Matt Egan, *AI Could Pose 'Extinction-Level' Threat to Humans and the US Must Intervene, State Dept.-Commissioned Report Warns*, CNN BUS (Mar. 12, 2024, 8:38 PM), https://www.cnn.com/2024/03/12/business/artificial-intelligence-ai-report-extinction/index.html.

[46] *Introducing ChatGPT*, OPENAI (Nov. 30, 2022), https://openai.com/index/chatgpt/.

[47] Rachna Dhanrajani, *AI Spending Soars: Apple, Microsoft, Google, Amazon, and Meta Lead the Charge with $60 Billion Commitment,* CNBC TV 18 (Nov. 7, 2024), https://www.cnbctv18.com/technology/ai-spending-soars-apple-microsoft-google-amazon-meta-lead-the-charge-19505992.htm.

[48] *See e.g.*, Sheridan Wall & Silke Schellmann, *Disability Rights Advocates Are Worried About Discrimination in AI Hiring Tools*, MIT TECH. R. (Jul. 21, 2021), https://www.technologyreview.com/2021/07/21/1029860/disability-rights-employment-discrimination-ai-hiring/;*Civic Engagement: Artificial Intelligence Issue Brief*, NAACP, https://naacp.org/resources/civic-engagement-artificial-intelligence-issue-brief (last visited Feb. 24, 2025) ("we are focused and concerned about the role AI might play in misinformation, disinformation, and the dilution of the Black vote."); Daniel Leufer, *Computers Are Binary, People Are Not: How AI Systems Undermine LGBTQ Identity*, ACESSNOW (Jan. 13, 2023), https://www.accessnow.org/how-ai-systems-undermine-lgbtq-identity/.

[49] Walter G. Moss, *Artificial Intelligence: A New Warning*, LAPROGRESSIVE (Jun. 16, 2024), https://www.laprogressive.com/techie-tips/artificial-intelligence-warning ("technology [is] 'the greatest destructive force in modern society . . . .'").

[50] *See generally* Henry H. Perritt, Jr., *Robots as Pirates,* 73 CATH. U. L. REV. 57 (2024) (analyzing claims that AI is pirating intellectual property and jeopardizes good writing).

[51] *See generally* Henry H. Perritt, Jr*., Robot Slanderer,* 46 U. ARK. LITTLE ROCK L. REV. 169 (2025) (questioning claims of widespread AI generated misinformation and defamation).

[52] *See generally* Henry H. Perritt, Jr., *Robot Job Destroyer,* 84 LA. L. REV. 207 (2023) (providing critical analysis of labor market effects).

The technology itself is incremental, building on statistical and analytical techniques that have been the bread and butter of social scientists for a hundred years or more. Now, large collections of data on the internet, and greatly increased computing power, storage, and communications capacity at low cost, extend machine learning and pattern matching techniques that have emerged gradually throughout society for decades.

Generative AI employs well-established and decades-old statistical and natural-language-processing principles.[53] Only a few analytical innovations, such as transformers,[54] enable it. Far more important are dramatic advances in computing power, miniaturization, storage, and digital communication bandwidth.[55]

But these advances have given new power to century-old factor analysis and statistical correlation models, now embodied in products, such as ChatGPT and Google Gemini that can accept queries[56] [57]—usually called prompts—in the form of hundreds of words of natural language, and extract requested information from an enormous repository of everything that is accessible through the internet and many other private databases. Then, the products are glib in expressing the results in grammatically correct and fluid natural language.[58]

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[53] In *Ex Parte Daniel J. Ferranti*, the USPTO's Patent Trial and Board rejected a claim limitation of "natural language processing (NLP) algorithms" because it was "well-known, conventional, and routine," going back into the 1950s. Ex Parte Daniel J. Ferranti, Appeal 2022-002794, 2023 WL 9061302, at *1, *10 (Patent Tr. & App. Bd. 2023).

[54] What Are Transformers in Artificial Intelligence?, AWS, https://aws.amazon.com/what-is/transformers-in-artificial-intelligence/ (last visited Feb. 18, 2024); *See* Jakob Uszkoreit, *Transformer: A Novel Neural Network Architecture for Language Understanding,* GOOGLE RESEARCH (Aug. 31, 2027), https://research.google/blog/transformer-a-novel-neural-network-architecture-for-language-understanding/ (explaining how transformers work, compared to RNNs; summarizing work of eight Google AI researchers); Giuliano Giacaglia, *How Transformers Work*, MEDIUM (Mar. 10, 2019), https://medium.com/towards-data-science/transformers-141e32e69591 (explaining transformers and comparing them with recursive neural networks; giving examples of language translation systems); Rick Merritt, *What Is a Transformer Model?*, NVIDIA (Mar. 22, 2022), https://blogs.nvidia.com/blog/2022/03/25/what-is-a-transformer-model/ (explaining how transformers "pay attention") ("A transformer model is a neural network that learns context and thus meaning by tracking relationships in sequential data like the words in this sentence."); JUAN GUERRERO ET AL., HIERARCHICAL SEMANTIC ENCODING FOR CONTEXTUAL UNDERSTANDING IN LARGE LANGUAGE MODELS 1-2 (2024) [hereinafter GUERREROO] (explaining relationship between use of transformers in LLM processing and semantic hierarchies).

[55] *See* U.S. GOV'T ACCOUNTABILITY OFF., ARTIFICIAL INTELLIGENCE: GENERATIVE AI TECHNOLOGIES AND THEIR COMMERCIAL APPLICATIONS 3 (2024), https://www.gao.gov/assets/gao-24-106946.pdf [hereinafter GAO REPORT] (identifying technologies that made generative AI possible).

[56] CHATGPT, https://chatgpt.com (last visited Feb. 21, 2025).

[57] GEMINI, https://gemini.google.com (last visited Feb. 21, 2025).

[58] For example, on November 15th, 20204 the author prompted Google Gemini: "would a law review article on an ai generated patent infringement detector be interesting?" Gemini responded:

> "Yes, a law review article on an AI-generated patent infringement detector would be very interesting and timely. Here's why:
>
> - **"Emerging Technology:** AI is rapidly changing how we create and protect intellectual property. An AI tool that can detect patent infringement has significant implications for businesses and legal practice.
> - **"Novel Legal Questions:** This technology raises new legal questions about the accuracy, reliability, and biases of AI in legal contexts. It also touches on issues of explainability and transparency in AI decision-making.

II. Reality

Models of semantic relationships in language are developed by interactive comparison of sentences separately deconstructed by neural networks and computing a loss function that represents their similarity or lack thereof.[59]

Natural language user queries can be preprocessed to chunk a set of sentences of the natural language user query into a set of smaller sentences and to retain the references between chunks of the set of sentences.[60] For each chunk of preprocessed user query a Name Entity Recognition (NER) ensemble extracts a domain specific name entity from the chunked preprocessed user query.[61]

Classification techniques model the topics of each chunk. Then, in appropriate applications, sentiment analysis can determine a sentiment of each chunk of the user query.[62] User queries are converted to system queries by a combination of different natural-language-processing functions, such as NER, sentiment analysis, part of speech tagging, canonicalization,[63] classification, and translation.

Then, pattern matching techniques are used to compare the system query to the knowledge model to determine the closest state in the knowledge model. The system returns a set of decisions scored according to their degree of match with the system query.[64] The winner state in the knowledge model is the knowledge state with the highest score.[65]

Systems can be fine-tuned by taking large language models trained on the full array of data usually used for training such models, and then connecting them with more specialized learning databases. The machine learning system constructs new concept

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- **"Practical Significance:** Such a tool could significantly impact patent litigation, making the process more efficient and potentially more accurate. This has real-world consequences for innovators and businesses."

Google Gemini then went on to suggest topics to be covered in the article.

[59] Method & Apparatus for Classifying Class, to which Sentence Belongs, Using Deep neural Network, U.S. Patent No. 11,568,240 col. 17 l. 7–24 (filed May 16, 2018).

[60] *See* Cameron Hashemi-Pour & Nick Barney, *What is Named Entity Recognition (NER)?*, TECHTARGET: WHAT IS?, https://www.techtarget.com/whatis/definition/named-entity-recognition-NER (last visited Feb. 24, 2025).

[61] *See id.* Named Entity Recognition (NER) detects semantic entities such as names, locations, business enterprises, events, products, themes, topics, monetary values, and percentages. *Id.* Once they are detected, the entities are tagged and linked to an overarching neural network. *See id.*

[62] *See What is Sentiment Analysis*, AWS, https://aws.amazon.com/what-is/sentiment-analysis/(last visited Feb. 21, 2025).

[63] Canonicalization is the act of converting free-form expression into standardized forms. *See What Is Canonicalization*, GOOGLE SEARCH CENT., https://developers.google.com/search/docs/crawling-indexing/canonicalization (last visited Mar. 8, 2025); *see also* Convolutional State Modeling for Planning Natural Language Conversations, U.S. Patent Application No. 2020/0387672 figs. 1–3, figs. 12A–12B, 27–64. (filed Aug. 25, 2020) (abandoned).

[64] Convolutional State Modeling for Planning Nat. Language Conversations, U.S. Patent Application No. 2020/0387672 ¶¶ 44, 95 (filed Aug. 25, 2020) (abandoned) (referring to pattern matching).

[65] *Id.* at ¶5.

vectors enabling a branching by subject matter before more finely grained responses are constructed.[66]

Like all technological innovation, artificial intelligence builds on foundations established long ago: mathematical and statistical theories, computational methods, and computer architectures. Yet, generative AI is a young art. The press, media, and government excitement over it, however overblown, indicates its potential as further innovation occurs. The enormous amounts of capital invested in generative AI ensure that lots of smart people will be inventing new processes and systems involving AI technology.[67]

IV. The Problem

Detecting patent infringers is a formidable challenge because of the volume of information involved. Hundreds of thousands of patents are issued annually[68]—each of which may infringe earlier patents if practiced or be invalid because they are anticipated. Even more new products and services are not the subject of patents.[69] A patent owner concerned about potential infringement must decide where to look and then decide what to do about it when he identifies a suspect infringer.

A. Where to Look?

Searching for patent infringement is not the same as a prior art search. One does not infringe a patent by talking about it or writing about it. Infringement of a patent occurs

[66] *See* An Intelligent Question and Answer Method and Device Based on Large Language Model, China Patent No. 117520491A (filed Oct. 27, 2023) (Disclosure of Invention section).
[67] *AI Investment Forecast to Approach $200 Billion Globally by 2025,* GOLDMAN SACHS (Aug. 1, 2023), https://goldmansachs.com/insights/articles/ai-investmant-forecast-to-approach-200-billion-globally-by-2025 ("Innovations in electricity and personal computers unleashed investment booms of as much as 2% of U.S. GDP as the technologies were adopted into the broader economy. Now, investment in artificial intelligence is ramping up quickly and could eventually have an even bigger impact on GDP . . . .").
[68] *U.S. Patent Activity*, USPTO, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm (last visited Mar. 8, 2025) (reporting applications and patent grants).
[69] Matt Clancy, *How Many Inventions are Patented?*, NEW THINGS (Mar. 29, 2024), https://www.newthingsunderthesun.com/pub/w6zweqxg/release/2; Stephen Kinsella, *Study: Most Important Innovations are Not Patented*, INFOJUSTICE (Dec. 2, 2013), https://infojustice.org/archives/31509; *See generally Why 95% of New Products Miss the Mark (and How Yours can Avoid the Same Fate)*, MIT PRO. EDUC., https://professionalprograms.mit.edu/blog/design/why-95-of-new-products-miss-the-mark-and-how-yours-can-avoid-the-same-fate/ (last visited Feb. 24, 2025).

only by the making, selling, importing, or using the infringing product.[70] Even advertising a patented device is not itself infringement.[71]

The challenge is that the search engine in the system must be organized enough to focus on those who are making, using, or selling products or services similar to the patent.[72] A rational way to address the challenge is to concentrate on sources of information most likely to be used by persons or entities trying to commercialize products.

In this regard, patent documents may be a useful starting point, but they are not the best place to look. Most patents are never commercialized, and most are never practiced.

The USPTO issued 313,219 utility patents in 2023.[73] But most of them will never have a significant presence in the marketplace because "[m]ost patented inventions are found worthless by their owners causing many related patents to be abandoned."[74] Mark Lemley explains that most technology companies even ignore patents that their competitors may hold.[75] They instruct their engineers not to read patents, and their patent lawyers do not conduct searches before filing patent applications or launching products.[76] Instead, technology companies wait and see if anyone claims patent infringement, and even then, usually ignore cease-and-desist letters.[77] They take their chances in court and hope to invalidate the patent or avoid a finding of infringement.[78] This is not altogether irrational because close to three-fourths of patents turn out to be invalid or not infringed.[79]

Many products and services that attract significant demand are never the subject of patent applications. Their inventors and vendors instead rely on trade secrets, on first

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[70] 35 U.S.C § 271(a); *see* New Wrinkle v. Fritz, 30 F.Supp. 89, 91 (W.D.N.Y. 1939) ("Sale means the making of the agreement binding the parties. . . . Displaying samples and demonstrating their use are mere incidents in the solicitation of the sale, and in no way affect the place of sale."); *see also* Marlatt v. Mergenthaler Linotype Co., 70 F.Supp. 426, 430 (S.D. Cal.1947) (finding that merely holding or storing the accused machine was not infringement).

[71] Ling-Temco-Vought, Inc. v. Kollsman Instrument Corp., 372 F.2d 263, 270 (2d Cir. 1967) (noting that the "mere advertising of a patented device is not itself an infringement.") (citing Knapp-Monarch Co. v. Casco Prods. Corp., 342 F.2d 622, 626 (7th Cir. 1965)).

[72] 35 U.S.C. § 271(a) ("whoever . . . makes, uses, offers to sell, [imports], or sells any patented invention . . . infringes the patent.").

[73] *The State of U.S. Innovation: USPTO Patent Statistics Report 2023,* TTCONSULTANTS (Mar. 7, 2024), https://ttconsultants.com/the-state-of-u-s-innovation-uspto-patent-statistics-report-2023/; *see also* Mark A. Lemley, *Ignoring Patents,* 2008(19) MICH. ST. L. REV. 19, n.1 (reporting that 2,524,321 patents were issued between 1987 and 2007 and that more than a third of all patents issued in the 217 years of U.S. history were issued in that twenty-year period).

[74] Richard Gruner, *Does Anybody See What I See?: Abandoned patents and their Impacts on Technology Development*, 11 N.Y.U. J. INTELL. PROP. & ENT. L.77, 83 (2021) (citing Jonathan A. Barney, *A Study of Patent Mortality Rates: Using Statistical Survival Analysis to Rate and Value Patent Assets*, 30 AIPLA Q.J. 317, 329 (2002) ("A relatively large number of patents appear to be worth little or nothing while a relatively small number appear to be worth a great deal.")).

[75] Lemley, *supra* note 73, at 21.

[76] *Id.*

[77] *Id.* at 22.

[78] *Id.*

[79] *Id.* at 27.

mover advantage, or on branding to fend off competitors. Large segments of modern economies prefer trade secret protection over patent protection.[80] The attractiveness of trade secrets over patents is greater when the likelihood of reverse engineering is low, when the trade secrets behind a product or service need not be disclosed when the market or service is commercialized, and when the pace of innovation is high, making it unlikely that market participants can keep up with technology with a series of patents, given the delays in their issuance.[81] First-mover advantage may be sufficient when the pace of innovation is great,[82] and a first mover can build brand recognition and a customer base rapidly.[83] An infringement detector must have a strategy to find the innovators who are hiding behind trade secrets or counting on first-mover advantage.

Journal articles may not be a particularly helpful source, because their content is likely to reflect technological developments not yet ready for commercialization.[84] Other communication channels are more productive: product advertisements are a direct indicator of selling, and they increasingly are targeted statistically through online services,[85] making them easier to retrieve for inclusion in a database to be searched for matches with the patent claims. White papers made available on websites and through unsolicited email promotions are another useful source because they are frequently written by sellers to promote particular products.[86] Interviews using keywords such as

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[80] *See* EUR. UNION INTELL. PROP. OFF., PROTECTING INNOVATION THROUGH TRADE SECRETS AND PATENTS: DETERMINANTS FOR EUROPEAN UNION FIRMS 28 (2017) [hereinafter EU Study] ("The use of the trade secrets is clearly higher than the use of patents in every Member State, ranging from about one third higher use of trade secrets in Italy to nearly three times in Croatia."); *see also* Andrew A. Swartz, *The Corporate Preference For Trade Secret*, 74 OHIO ST. L. J. 623, 658–59 (2013) (reviewing empirical literature and synthesizing the conclusion that corporations prefer trade secrets over patents); J. Jonas Anderson, *Secret Inventions*, 26 BERKELEY TECH. L. J. 917, 928–35 (2011) (criticizing the law's bias in favor of patents as opposed to trade secrets).

[81] *See* David S. Levine & Ted Sichelman, *Why Do Startups Use Trade Secrets?,* 94 NOTRE DAME L. REV. 751, 756–76 (2019) (comparing reasons for preferring trade-secret or patent protection); EU Study, *supra* note 80, at 57 (finding that "market novelty and innovation in goods are associated with a preference for patents while process innovations and innovations in services are more often protected through secrecy."); Andrew A. Swartz, *The Corporate Preference For Trade Secret,* 74 OHIO ST. L. J. Ohio St. L. J. 623, 637–46 (2013) (enumerating factors involved in choosing between trade secret and patent).

[82] *See generally* Fernando F. Suarez & Gianvito Lanzolla, *The Half-Truth of First-Mover Advantage* HARV. BUS. R. (Apr. 2005), https://hbr.org/2005/04/the-half-truth-of-first-mover-advantage (analyzing first-mover advantage with relation to pace of innovation, among other factors).

[83] Elizabeth A. Rosenblatt, *A Theory of IP's Negative Space*, 34 COLUM. J. L. & ARTS 317, 346–47 (2011) (analyzing first mover advantage and its relationship to network effects); Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1585–86 (2003) (explaining first-mover advantage; arguing that there are other ex post reward systems for creativity than intellectual property law, and that "[i]ndeed, it seems clear that at least some innovation would continue in the absence of any patent protection.").

[84] *See* Oliver Petschenyk, *Do Any New Battery Cell Technologies Have a Solidified Future… Yet?*, JUSTAUTO (Sep. 23, 2024) https://www.just-auto.com/analyst-comment/do-any-new-battery-cell-technologies-have-a-solidified-future-yet/ (asserting "[t]he harsh reality is that 90% of news, plans and solid-state plant activity appears to be bogus[.]").

[85] *See e.g., Activate the Best Performing Audiences with Ease*, EPSILON https://www.epsilon.com/us/products-and-services/data/digital-audiences (last visited Feb. 17, 2025) (promoting targeted advertising).

[86] *See e.g.,* FREQUENTIS, WHITE PAPER: DRONES 1–6 (2018)(promoting framework for air traffic management for drones).

"new product," "introducing," "demand," "unveiling," "launch," and their semantic equivalents, can be helpful in identifying specific interviews. Demonstrations and advertisements on webpages and descriptions on product web pages are another obvious source, as are product demonstrations on YouTube.[87]

So, the search challenge is not only the challenge of searching for matching technical concepts as in prior art searching; it also must include matching indicia of particular types of conduct. Traditional means of meeting both challenges involved terms-and-connectors Boolean searches and conventional natural language searching as it was embedded in 2020 Westlaw, Google Patents, and Google. But that approach can miss a lot, produce false positives, and requires much work to formulate and refine the search queries. Generative AI substantially increases the power of overcoming both challenges with less user effort, as explained in Part V of this article.

B. What to Do About It?

When a search uncovers potential patent infringement in other patent applications, new patents, in product advertisements and offers, and in news releases and news stories, the patent owner must decide what to do about the potential infringement. Part V explains that a good infringement detection system will winnow its suspects, saving its energy for the most threatening. Depending on how fully developed the infringement threat is, a number of forums exist to challenge the potentially infringing conduct.

I. Protests

Anyone may file a protest against a pending patent application, but it must be filed before publication of the application or before the date of the notice of allowance, whichever is first.[88] This procedure is little used, because patent applications are secret until they are published.[89] Nevertheless, if the infringement detector uncovers evidence that an infringing application has been filed, it is one more avenue to offer the existing patent as a barrier to the grant of an infringing one.

II. Post Application Publication

After a patent application is published under 35 U.S.C. § 122, subsection (e) permits anyone to submit "any patent, published patent application, or other printed publication of potential relevance to the examination of an application."[90] The submission may not extend beyond a "concise description of the asserted relevance of each submitted

[87] *See e.g.,* AmpedAuto, *Next-Gen BYD Blade Battery: A New Era in EV Safety!*, YOUTUBE (Jul. 27, 2024), https://www.youtube.com/watch?v=TXXM3ptw3qo.
[88] 37 C.F.R. § 1.291; *see also* MPEP § 1901 (9th ed. Rev. 01.2024, Nov. 2024).
[89] 35 U.S.C. § 122.
[90] 35 U.S.C. § 122(e).

document."[91] As the Manual of Patent Examining Procedure, also known as the MPEP,[92] explains:

> The provisions of 35 U.S.C. 122(c) and (e) limit a third party's ability to protest, oppose the grant of, or have information entered and considered in an application pending before the Office. . . . [T]hese provisions[, however,] do not limit the Office's authority to independently re-open the prosecution of a pending application on the Office's own initiative and consider information deemed relevant to the patentability of any claim in the application.[93]

The patent office provides a standard form for such submissions.[94]

In the story in the introduction, Chalmers would submit Bruce's patent in a 35 U.S.C. § 122 submission, aimed to cause a rejection, on anticipation grounds (35 U.S.C. § 102), of any potentially infringing application.

III. Post Issuance Challenges

Once a patent is issued, it is subject to review, amendment, or cancellation in a variety of proceedings. In a reissuance, the inventor or other owners of the patent surrenders the original patent and tries to get a new one to correct errors in the original patent.[95] In a re-examination proceeding, which may be triggered by the patent owner or a third party, the patent office considers new information that raises questions about patentability.[96] In Post-Grant Review, available for only nine months after patent issuance, anyone can challenge the validity of the patent on any ground that could have resulted in the patent's denial during the prosecution process.[97] In Inter Partes Review, anyone can challenge the validity of a patent, but on more limited grounds, offering only prior art in the form of patents or publications to raise questions about novelty and obviousness.[98] The Inter Partes Review proceeding is available nine months after issuance of the patent and until

[91] 35 U.S.C. § 122(e)(2).
[92] The Manual of Patent Examining Procedure (MPEP) is published by the U.S. Patent and Trademark Office (USPTO) to provide patent examiners and practitioners guidance on the practices and procedures followed by the USPTO. MPEP Foreword (9th ed. Rev. 01.2024, Nov. 2024). While it does not constitute law, it is generally regarded as an authoritative resource during patent prosecution. *Id.*
[93] MPEP § 1134 (9th ed. Rev. 01.2024, Nov. 2024).
[94] MPEP § 1134.01(II)(A)(1) (9th ed. Rev. 01.2024, Nov. 2024).
[95] 35 U.S.C. § 251 (authorizing reissue of "defective patents").
[96] 35 U.S.C. §§ 302–305 (authorizing re-examination).
[97] 35 U.S.C. §§ 321–329 (authorizing Post Grant Review).
[98] 35 U.S.C. §§ 311–319 (authorizing Inter Partes Review).

the patent expires.[99] The PTAB conducts the Post-Grant Review and Inter Partes Review proceedings.[100]

In addition to these administrative processes, United States district courts have the power to determine the validity of patents asserted in suits for infringement,[101] or in declaratory judgment actions brought by potential infringers.[102]

Some claims would ripen into infringement lawsuits.[103] Such suits typically are preceded by sending cease and desist letters.[104]

If litigation over infringement results from the use of the AI enabled infringement detector, use of the detector and its working may be discoverable but it is not clear why that would matter. How an infringer was discovered is irrelevant to the analysis of infringement. If discovery of the means of detection is sought, use of the AI infringement detector may qualify as lawyer work product under Fed. R. Civ. P. 26(b)(3)(A) because it is prepared in anticipation of litigation by a lawyer.[105] If it qualifies as work product, an accused infringer is not entitled to it unless he can show compelling need,[106] which is unlikely because he can obtain his own AI enabled search engine and use it.

V. What Does Generative AI Add?

Generative AI significantly expands the capability of computerized systems to search unlimited quantities of information to detect activities that may infringe existing patents. The problem described in Part IV is well suited for generative AI because it is language-based and thus presents different challenges from image creation, music creation, writing computer code, crafting a fictional narrative, or conducting economic or political analyses. The relevant technology is explained well in a 2017 patent,[107] and in an accompanying white paper written by one of the co-inventors.[108]

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[99] 35 U.S.C. § 311(c).
[100] 35 U.S.C. § 318 (role of PTAB in deciding IPR cases); 35 U.S.C. § 328 (role of PTAB in deciding PGR cases).
[101] 35 U.S.C. §§ 281–82.
[102] *See* MedImmune, Inc. v. Genentech, Inc., 549 U.S. 118, 126–27 (2007) (explaining prerequisites to maintain declaratory judgment action to invalidate patent).
[103] Generative AI might be used to help decide the lawsuit, as by evaluating claim similarity for literal infringement and doctrine of equivalents infringement, but that is beyond the scope of this article.
[104] *See* Leah Chan Grinvald, *Policing the Cease-and-Desist Letter,* 49 U.S.F. L. REV. 411, 430 (2015).
[105] FED. R. CIV. P. 26(b)(3)(A) (enumerating conditions for work-product status).
[106] FED. R. CIV. P. 26(b)(3)(A)(ii) (setting pre-conditions for discoverability of work product).
[107] *See* Exhaustive Automatic Processing of Textual Information, U.S. Patent No. 9,633,005 (filed Oct. 8, 2014).
[108] *See* ANISIMOVICH K. V. ET AL., SYNTACTIC AND SEMANTIC PARSER BASED ON ABBY COMPRENO LINGUISTIC TECHNOLOGIES (2012) [hereinafter COMPRENO PAPER].

The goal of the patented system and method is to understand "who did what to whom (when and where)."[109] It does this by combining syntactic disambiguation with semantic understanding.[110] The syntactic structure of a sentence is represented by a syntactic tree, not unlike a template for the diagramming of a sentence.[111]

The syntactic model has a morphological matrix to capture attributes and values of words representing different parts of speech, such a singular versus plural and other categories in noun declension or verb conjugation.[112]

The syntactical analysis also applies models for the grammatical structure of the language,[113] along with ellipsis templates, which extract meaning despite the omission of certain words.[114] Also included in the syntactic analysis are movement rules for displaced elements, like different word order, some of which is material to the meaning, and some of which is essential to the meaning, especially in a language like English which uses word order to determine parts of speech.[115] Figure 2C of the '005 patent gives examples of the syntactic parsing of a sentence.[116]

Once the syntactic analysis is complete, the results are connected to a semantic hierarchy—a "thesaurus hierarchical tree"[117]—to determine sentence meaning. Figure 12 of the '005 patent illustrates how the second phase of the analysis starts with a pre-existing language-independent semantic hierarchy.[118]

In this phase, the model maps language-specific lexical classes—words in their various forms and roles—onto a semantic tree.[119] Every word is connected to at least one class in the semantic tree.[120] Statistical prediction is used to predict which of several classes a word belongs to given a particular context.[121]

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[109] *Id.* at intro (omission of emphasis).
[110] *Id.*
[111] *Id.* at 1.1; s*ee also* Matt Ellis, *Everything You Need to Know About Sentence Diagramming, With Examples,* GRAMMARLY, https://www.grammarly.com/blog/sentences/sentence-diagramming/ (last updated May 26, 2022).
[112] COMPRENO PAPER, *supra* note 108 at 1.3.
[113] *Id.* at 1.4, 1.6.
[114] *Id.* at 2.2.
[115] *Id.* at 2.3; *see generally* Emile Dodds, *The Simple Guide to Word Order in English,* LENARDO ENGLISH (May 19, 2022), https://www.leonardoenglish.com/blog/the-simple-guide-to-english-word-order.
[116] *See* Exhaustive Automatic Processing of Textual Information, U.S. Patent No. 9,633,005 fig. 2C (filed Oct. 8, 2014).
[117] COMPRENO PAPER, *supra* note 108, at 3.1.
[118] *See* Exhaustive Automatic Processing of Textual Information, U.S. Patent No. 9,633,005 fig. 12 (filed Oct. 8, 2014).
[119] *See* COMPRENO PAPER, *supra* note 108, at 3.1.
[120] *Id.*
[121] *See id.*

Sematic slots accommodate links and relations between concepts, such as agent, object, and action.[122] For example, in the sentence, "The boy works," *boy* is the agent and *works* is the action. In the sentence, "The letter is written with a pen," *the letter* is the object, and *with a pen* is the instrument. Slots also allow for evaluations such as "*beautiful* dress," emotions such as "he leapt *enthusiastically*," parentheticals like "*for example*," functions like "*as a teacher*," and up to more than 300 slots.[123]

Standard language-independent semantic hierarchies have been available at least since publication of the Revised Hierarchical Model in 1994, which updated a collection of separate 1984 models.[124]
Some vendors offer semantic hierarchies in the form of digital thesauri that can be integrated into large language machine learning.[125]

The context of infringement detection imposes relatively few demands on the generative capability of these new systems. Infringement detection requires robust search, not robust expression. The test of any implementation of the technology should focus on its ability to understand existing material and to match new material with it, not on the fluency or elegance of what it says.

A good infringement detector using this technology would start with the literal elements of a patent claim, progressively abstract them in an appropriate semantic tree, search according to the concepts embedded in the patent, and then apply another layer of search to the results, bringing it back down to element-by-element comparison, and applying the Doctrine of Equivalents in the process.

As suggested, a good infringement detector would not confine itself to detecting literal infringement but would also look for Doctrine of Equivalents infringements. The Doctrine of Equivalents allows infringement to be shown by proof that an "'accused product performs "substantially the same function in substantially the same way to obtain the same result[,]"'"—the function-way-result test—or by showing that the differences between the claims and the accused device or process are "insubstantial."[126] Generative AI can translate the function-way-result test into an ontological rule set, making use of semantic trees.

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[122] *Id.* at 3.2.
[123] *See id.*
[124] Judith F. Kroll, et al., *The Revised Hierarchical Model: A Critical Review and Assessment,* 13(3) BILINGUALISM: LANGUAGE & COGNITION 373, 373 (2010).
[125] *See* Gary Leicester, *Enhanced AI with the CABI Thesaurus*, CABI DIGIT. LIBR. (Sep. 23, 2024) https://www.cabidigitallibrary.org/do/10.5555/blog-enhanced-ai-cabi-thesaurus.
[126] NexStep, Inc. v. Comcast Cable Commc'n, LLC, 119 F.4th 1355, 1370 (Fed. Cir. 2024) (affirming rejecting of infringement based on Doctrine of Equivalents). The *NexStep* court articulated three requirements for doctrine-of-equivalents proof of infringement: (1) the doctrine must be applied on a claim-element by claim-element basis; (2) the doctrine must be applied from the perspective of a PHOSITA; and (3) that the proof must be specific and complete. *Id.* at 1370–71.

A post-search winnowing of the suspects is appropriate. Any search engine is going to produce false alarms, and they should be identified and discarded. Some of the remainder should be marked and followed because they represent technological developments that may mature into infringing products but have not yet escaped the lab. A much smaller number of suspects may appear to infringe already and can be made the subject of cease-and-desist letters, perhaps generated automatically by the system.[127] In a much smaller set of cases, actual infringement complaints are appropriate, and they also may be drafted by the system but must receive careful scrutiny and revision before they are filed.

A practical infringement detection system must distinguish four different stages in the development of potentially infringing products or processes. In particular, the system must recognize a potential infringement that is still in the experimental or laboratory stage. It must be able to identify potential infringement that has completed its experimental tests and has just been released from the lab. Then, it must recognize when a product or service has actually been introduced into the market through advertisements or mechanisms for accepting orders. Finally, it should be able to recognize when an infringing product or service actually is attracting customers.

The four categories identified represent a kind of funnel. Many more potential infringements occur at each stage than in the following one. Each stage of the intelligence collection should allow a patent holder to identify potential infringers so that they can be subject to progressively increased scrutiny as they pass from each stage to the next. Most of a patent holder's attention should be focused on the last category, which is the first time a potentially infringing development represents a real competitive threat.

Generative AI, exemplified by chat GPT and Google Gemini, has an important future in certain areas of human activity, particularly those involving the manipulation and analysis of language, search, and the matching of fragments of language and the concepts they represent. The problem that Chalmers presented to Royal is well suited for generative AI. Better suited than image or music creation, writing computer program code, crafting a fictional narrative, or conducting economic or political analysis.

Detecting patent infringement is fundamentally a search problem, focused on review of other patents, published patent applications, trade journals, popular press articles, television and radio interviews, web blogs, YouTube sites, and webpages, particularly those featuring product announcements.

[127] Cease and desist letters have proliferated, especially as a result of reduced transaction costs in the e-mail and Internet age and in conjunction with the patent troll phenomenon. Grinvald, *supra* note 104, at 446–47 (describing abuses arising from proliferating cease and desist letters and proposing remedies). Cease and desist letters are effective in inducing settlement, even of weak claims. *Id.* at 417. Small businesses are especially likely to capitulate. *Id.* at 414.

VI. Patent Eligibility

The patent system is intended to provide an incentive for innovation.[128] It should provide an incentive for innovation in systems and methods for patent prosecution as well as for innovation in other fields. That leads to the question: Can the system and method for patent infringement detection described in this article be patented? That question in turn leads to a number of subordinate questions which are at the forefront of current dialogue in the patent community: Is an AI created search engine eligible subject matter? Who is the inventor when generative AI does the lion share of the conception,[129] and maybe also the reduction to practice? Can the computer system running generative AI be the inventor, or must it be the human user of the system? Can the user qualify even if his or her contribution is relatively minor? Does the fact that the generative AI was able to synthesize the new invention from knowledge already available to its machine learning mean that anything it comes up with is obvious? Is generative AI a PHOSITA for obviousness analysis?

A. The AI-Generated Invention

The fictional Royal is reluctant to spend too much time on inventing a system and method for identifying patent infringement, so he accepts Chalmer's suggestion that they use ChatGPT to simplify the process of describing an invention and crafting a patent application.

The author of this article picked up the idea from there. On November 13th, 2024, the author asked the generative AI program, ChatGPT, to design "a generative AI system to search for and identify products and services that potentially infringe on a patent."

ChatGPT responded with an 899-word description of system components and method steps. The author prompted, "write the claims for a patent that does this." ChatGPT responded with two independent and eleven dependent claims.

The author reviewed the ChatGPT-generated drafts and saw several issues. So the author prompted ChatGPT to make revisions.

The appendices at the end of this article show the results. The initial results were not bad for a first draft, but they were not suitable for submission to the USPTO.

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[128] *See* Nautilus, Inc. v. Biosig Instruments, Inc., 572 U.S. 898, 909 (2014) (noting that some degree of ambiguity is the price of achieving the desired inventive effect).

[129] In copyright law, whether the owner of a copyright in a computer program has a copyright in the program's output may depend on whether the computer program has done the "'lion's share of the work'" in creating the expression. *See* Design Data Corp. v. Unigate Enter., Inc., 847 F.3d 1169, 1173 (9th Cir. 2017) (describing without adopting "lion's share" test). While this does not exactly match the configuration of a patent-generating computer program, it is still relevant because it addresses allocation of intellectual property interests when computer systems add significant value.

To have a patent application considered by the USPTO, two threshold barriers must be overcome: (1) a human inventor must be involved in the conception,[130] and (2) the AI generated invention must be eligible for a patent under 35 U.S.C. § 101.[131] If either requirement is not met, a patent cannot be issued. If both requirements are met, the AI-draft still must not be anticipated under 35 U.S.C. § 102,[132] it must not be obvious under 35 U.S.C. § 103,[133] and it must be adequately described under 35 U.S.C. § 112.[134]

B. Who Is the Inventor?

In the Spring of 2024, the USPTO issued a guidance on the use of AI in preparation of patent applications.[135] It recognized the power of AI technology to analyze large amounts of data and to detect patterns not apparent to human analysts, and applauded its potential to reduce barriers and costs.[136] It emphasized that no prohibition exists against using AI tools in drafting patent specifications, responding to office actions, writing briefs, and writing claims.[137] It reminds practitioners, however, of the obligation under 37 CFR § 11.18(b) to certify that every paper submitted to the office has been subject to a reasonable inquiry and that the submitter believes that the statements in the paper are true.[138]

The USPTO guidance discussed how the duty of disclosure under 37 CFR § 1.56(b) operates when AI is used to generate applications and related documents.[139] Applicants have a duty to disclose AI use that may raise questions about inventorship: "material information could include evidence that a named inventor did not significantly contribute to the invention because the person's purported contributions were made by an AI system."[140] For example, the AI system might suggest embodiments that did not occur to the human inventor.[141] Furthermore, the USPTO guidance stated: "If there is a question as to whether there was at least one named inventor who significantly contributed to a claimed invention developed with the assistance of AI, information

[130] *See infra* part V.B.
[131] 35 U.S.C. § 101.
[132] 35 U.S.C. § 102.
[133] 35 U.S.C. § 103.
[134] 35 U.S.C. § 112.
[135] *See generally* Guidance on Use of Artificial Intelligence-Based Tools in Practice Before the United States Patent and Trademark Office, 89 Fed. Reg. 25609 (Apr. 11, 2024) [hereinafter Guidance on Use of AI-Based Tools].
[136] *Id.* at 25610.
[137] *Id.* at 25614.
[138] *Id.*
[139] *Id.* at 25615.
[140] *Id.*
[141] *Id.*

regarding the interaction with the AI system (*e.g.*, the inputs/outputs of the AI system) could be material and, if so, should be submitted to the USPTO."[142]

Because practitioners have a duty not to file claims known to be unpatentable, they must scrutinize the output of AI systems to assure compliance with 35 U.S.C. § 112, and to differentiate prophetic examples from actual working examples.[143]

In *Inventorship Guidance for AI-Assisted Inventions*, another USPTO issued guidance, the USPTO stated that it "recognizes that while an AI system may not be named an inventor or joint inventor in a patent or patent application, an AI system—like other tools—may perform acts that, if performed by a human, could constitute inventorship under our laws."[144] Furthermore, in this guidance USPTO stated that "applications and patents must not list any entity that is not a natural person as an inventor or joint inventor, even if an AI system may have been instrumental in the creation of the claimed invention[,]"[145] but the involvement of an AI system must be disclosed.

In this guidance the USPTO further declared that "a single person who uses an AI system to create an invention is also required to make a significant contribution to the invention, according to the *Pannu* factors, to be considered a proper inventor."[146] Thus, neither the robot nor the human user qualifies as an inventor, unless the human user satisfies the *Pannu* factors.[147] The USPTO guidance further elaborated on significant contribution and stated:

> In the event of a single person using an AI system to create an invention, that single person must make a significant contribution to every claim in the patent or patent application. Inventorship is improper in any patent or patent application that includes a claim in which at least one natural person did not significantly contribute to the claimed invention, even if the application or patent includes other claims invented by at least one natural person. Therefore, a rejection under 35 U.S.C. [§] 101 and [§] 115 should be made for each claim for which an examiner or other USPTO employee determines from the file record or extrinsic evidence that at least one natural person, *i.e.*, one or more named inventors, did not significantly contribute. . . . When the facts or evidence indicates that the named inventor or joint inventors did not contribute significantly to the claimed invention, *i.e.*, their contributions do not satisfy the *Pannu* factors for a particular claim, a rejection under 35 U.S.C. [§] 101 and [§] 115 is appropriate."[148]

[142] *Id.* (citing Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. at 10049).
[143] *Id.*
[144] Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. 10043, 10045 (Feb. 13, 2024).
[145] *Id.* at 10046.
[146] *Id.* at 10048.
[147] *Id.* at 10047.
[148] *Id.*

Recognizing a problem or defining a goal and turning it over to an AI system to come up with an invention is not enough.[149] But constructing a prompt to an AI system to elicit a particular solution to a specific problem is enough.[150] The test is whether the prompt qualifies as the contribution of an idea.[151] What ideas have been contributed by the author, equal to or greater than the ideas contributed by Mr. Link in the *Pannu* case? "Write claims," "write an abstract," and "write a background of the invention section" certainly do not qualify. The only possibility from the original interactions with ChatGPT is the initial prompt: "design a generative AI system to search for and identify products and services that potentially infringe on a patent." The prompt has three components: (1) a "generative AI system," (2) "products and services that potentially infringe," and (3) "a patent." These are humdrum and obvious concepts providing little creative guidance to ChatGPT. This prompt is hard to distinguish from the prompt, "Create an original design for a transaxle for a model car, including a schematic and a description of the transaxle[,]" from USPTO Example 1 Transaxle for Remote Control Car.[152]

Merely recognizing and embracing the output of an AI system is not enough.[153] But taking the robot's output and adding value to create an invention is enough, as might be conducting experimentation with an AI system's output.[154] A "natural person(s) who designs, builds, or trains an AI system in view of a specific problem to elicit a particular solution could be an inventor, where the designing, building, or training of the AI system is a significant contribution to the invention created with the AI system."[155] But "[m]aintaining 'intellectual domina[nce]'" over an AI system, or merely owning or overseeing an AI system, is not enough for inventorship.[156]

Pannu v. Iolab Corp. is regularly cited by the patent office for the factors to determine inventorship:

> All that is required of a joint inventor is that he or she (1) contribute in some significant manner to the conception or reduction to practice of the invention, (2) make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and (3) do more than merely explain to

[149] *Id.*
[150] *Id.*
[151] *See* Pannu v. Iolab Corp., 155 F.3d 1344, 1351 (Fed. Cir. 1998).
[152] USPTO, EXAMPLE 1: TRANSAXLE FOR REMOTE CONTROL CAR 2, https://www.uspto.gov/sites/default/files/documents/ai-inventorship-guidance-mechanical.pdf.
[153] Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. 10043, 10048 (Feb. 13, 2024).
[154] *Id.* at 10048–49.
[155] *Id.* at 10049.
[156] *Id.*

> the real inventors well-known concepts and/or the current state of the art.[157]

In *Pannu v. Iolab Corp*, the court found sufficient evidence to allow a jury to conclude that an individual, Link, qualified as a co-inventor because Pannu and Link discussed the invention, and Link contributed the idea of one-piece construction for an intraocular lens.[158]

The Patent Office published new guidance on the patent eligibility of AI inventions in July, 2024.[159] It provides three new examples of inventions involving AI and how the three new examples are analyzed for subject matter eligibility under 35 U.S.C. 101.[160] The USPTO's Example 1, however, is the most useful.[161] It analyzed five scenarios in the invention of a transaxle for a remote-controlled car.[162]

In Scenario 1 of the example, the users did no more than frame the prompt and review the output of an AI system, not changing it in any material way.[163] They did not qualify as inventors.[164]

In Scenario 2, one of the users builds the transaxle exactly as described by the AI output.[165] The users, however, still do not qualify as inventors.[166] Mere reduction to practice is not enough for inventorship.[167]

In Scenario 3, they prompt the AI system for alternative designs, conduct experiments, and change the types of fasteners described.[168] Now they qualify as inventors.[169]

Scenario 4 involves a supplementary prompt for manufacturing suggestions, followed by acceptance of a suggestion based on user knowledge.[170] The users qualify as inventors for the resulting dependent claim because of their contributions to the full scope of the claim, including the limitation of the claim from which claim 4 depends.[171] Even though the additional feature in claim 4 is conventional and achievable with routine

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[157] Pannu v. Iolab Corp., 155 F.3d 1344, 1351 (Fed. Cir. 1998).
[158] *Id.*
[159] 2024 Guidance Update on Patent Subject Matter Eligibility, Including on Artificial Intelligence, 89 Fed. Reg. 58128 (July 17, 2024) [hereinafter Guidance Update on Patent Subject Matter Eligibility].
[160] *Id.* at 58138 (referring to Examples 47, 48, and 49 at www.uspto.gov/ PatentEligibility).
[161] *See generally* USPTO, supra note 152, at 1–9.
[162] *See generally id.*
[163] *Id.* at 2–3.
[164] *Id.*
[165] *Id.* at 4.
[166] *Id.* at 5.
[167] *Id.* at 4–5.
[168] *Id.* at 5.
[169] *Id.* at 6–7.
[170] *Id.* at 7.
[171] *Id.* at 7–8.

experimentation that "does not negate the significance of Ruth and Morgan's [the users] contributions to the invention as a whole."[172]

In Scenario 5, Maverik oversaw the creation and training of the AI system.[173] But because he was not focused on any specific problems related to transaxles in RC cars, he is not an inventor.[174]

The USPTO guidance considers inventorship when generative AI does the lion's share of the conception, and maybe also the reduction to practice.[175] This arguably is the situation in the infringement detector application considered in this article.

The USPTO guidance suggests that crafting prompts for generative AI may shape the robot's work enough to represent a material contribution to conception.[176] The author wrote the prompts resulting in the AI-generated application. But those initial prompts border on the trivial; they are little more than articulation of the bare idea for an infringement search system. ChatGPT reduced the concept to practice, but that is not enough for inventorship.

Paradoxically, flaws in the AI drafted patent application enhance the likelihood that with modification, it might qualify for allowance. This is so because a perfect application would not require significant user input. It might qualify for a patent if it had been written by a human being; but, because it was written by a computer and computers do not qualify as inventors, it is not patentable. Conversely, the more value that the human user must add to fix the flaws in the AI drafted application, the greater the likelihood that the human user will qualify as an inventor. If he truly fixes the flaws, the invention is likely patentable.

Chalmers, not willing to jeopardize his reputation at the USPTO, would refuse to submit the ChatGPT results verbatim to the USPTO as a patent application. He would insist that Royal review them and make appropriate modifications. If Royal and Chalmers identify problematic prior art and recraft the ChatGPT draft to avoid prior art under 35 U.S.C. § 102 and 35 U.S.C. § 103, that activity would likely qualify as inventorship.

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[172] *Id.* at 8.
[173] *Id.*
[174] *Id.* at 8–9.
[175] In copyright law, whether the owner of a copyright in a computer program has a copyright in the program's output may depend on whether the computer program has done the "'lion's share of the work'" in creating the expression. *See* Design Data Corp. v. Unigate Enter., Inc., 847 F.3d 1169, 1173 (9th Cir. 2017) (describing without adopting "lion's share" test). While this does not exactly match the configuration of a patent-generating computer program, it is still relevant because it addresses allocation of intellectual property interests when computer systems add significant value.
[176] *See* Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. 10043, 10048 (Feb. 13, 2024).

One obvious deficiency in the ChatGPT product is the absence of drawings. Drawings must be included in a patent application when they are necessary to facilitate understanding of the invention.[177] Royal's (and the author's) creation of drawings is likely to be a sufficient contribution to conception of the invention to qualify Royal (and the author) as a co-inventor. Another obvious deficiency is the absence of reference to specific features of the drawings in the detailed description. Supplying these references is merely technical, however, and would likely not give rise to inventorship.

C. Is It Eligible?

Rowan Patents Analytics rates the probability of the ChatGPT-drafted application's eligibility for a patent under 35 U.S.C. § 101 in the bottom quartile.[178] The details of some AI systems qualify for patents, however.[179] New generative AI inventions qualify for patents if they meet the tests for patentability under 35 U.S.C. § 101,[180] as interpreted in *Alice/Mayo*.[181] It is also clear that prompts for an AI system can satisfy the conception requirement.[182] So, presenting the AI-drafted infringement detector in a form that is eligible for a patent requires meeting the requirement for patentability articulated by the USPTO.

The USPTO summarized its patent subject matter eligibility analysis in its July 2024 guidance on eligibility of inventions involving AI.[183] It republished the charts from the MPEP illustrating the multi-step process.[184] Step 1 involves determining whether the invention falls within one of the four statutory categories: process, machine, manufacture, or composition of matter.[185] Step 2 involves the two-part *Alice/Mayo* framework, referred to as *Alice/Mayo* Step 1, which asks whether the invention is directed to a judicial exception, and whether additional elements of the claim provide an inventive concept.[186] A separate chart, called Step 2A,[187] illustrates the two prongs of the Step 2A analysis, whether the claim recites an abstract idea, law of nature, or natural phenomenon, and whether it recites additional elements that integrate the judicial

[177] 35 U.S.C. § 113; 37 CFR § 1.81; *see also* MPEP § 608.02 (9th ed, Rev. 01.2024, Nov. 2024) (stating requirement for drawings in patent application).
[178] The rating resulted from running Rowan Patents Analytics against the patent application on November 19th, 2024. *See generally* ROWAN PATENTS, https://rowanpatents.com/?gad_source=1&gclid=Cj0KCQiA6Ou5BhCrARIsAPoTxrCd4RG2T-TBTUoRAwL4uwTO86mgAEgOVJRkRDYZ7Y0O-y4-du4iLGsaAmhBEALw_wcB (last visited Feb. 22, 2025).
[179] *See* Henry H. Perritt, Jr., *Undressing AI: Transparency Through Patents*, 34 U. TEX INTELL. PROP. J. 137, sec. IV (2024).
[180] 35 U.S.C. § 101.
[181] *See infra* Part V.C discussion of *Alice/Mayo* test for eligibility of subject matter under 35 U.S.C. § 101.
[182] Inventorship Guidance for AI-Assisted Inventions, 89 Fed. Reg. 10043, 10048 (Feb. 13, 2024) (Guiding Principle No. 2) ("[A] significant contribution could be shown by the way the person constructs the prompt in view of a specific problem to elicit a particular solution from the AI system.").
[183] Guidance Update on Patent Subject Matter Eligibility, 89 Fed. Reg. 58128 (July 17, 2024).
[184] *Id.* at 58131–32.
[185] *Id.* at 58132 (citing 35 U.S.C. § 101).
[186] *Id.*
[187] *Id.* at 58133.

exception into a practical application.[188] If the claim does not recite an abstract idea, law of nature, or natural phenomenon, or, if it does, but it recites additional elements that integrate the judicial exception into a practice application, the invention passes muster under Step 2A and qualifies as eligible subject matter.[189]

If the claim flunks Step 2A, Step 2B must be applied. Step 2B asks whether the claimed elements amount to significantly more than the judicial exception itself.[190] The USPTO guidance further states:

> Step 2A, Prong Two is similar to Step 2B in that both analyses involve evaluating a set of judicial considerations to determine if the claim is eligible. Although most of these judicial considerations overlap (*i.e.*, they are evaluated in both Step 2A, Prong Two and Step 2B), Step 2B includes a consideration of whether the additional element (or combination of elements) is a well-understood, routine, conventional activity. A claim may be found to lack significantly more (and thus be ineligible) based on one or more of these judicial considerations (*e.g.*, a conclusion that the additional limitation(s) is(are) insignificant extra-solution activity or mere instructions to apply an exception), in which case USPTO personnel will reject the claim under 35 U.S.C. 101 as lacking eligibility. If an eligibility rejection is based on a conclusion that an additional element or combination of elements is well-understood, routine, conventional activity in the field, the rejection should contain factual support for this conclusion, in accordance with MPEP sections 2106.05(d), subsection I and 2106.07(a).[191]

The USPTO guidance offers three examples of claims not reciting an abstract idea: (1) an application specific integrated circuit for an artificial neural network, (2) a system for monitoring dairy animals involving specific types of sensors, and (3) a treatment method for administering a drug.[192] The guidance does not explain why these claims do not recite an abstract idea, but it is notable that the first two involve hardware implementation and the third may as well.

The guidance cites *XY, LLC v. Trans Ova Genetics*,[193] as another example that does not recite an abstract idea. This case involved a claim to a flow cytometry apparatus to separate particles, another instance of hardware implementation.[194]

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[188] *Id.*
[189] *Id.*
[190] *Id.* at 58132.
[191] *Id.* at 58133–34 (internal footnotes omitted).
[192] *Id.* at 58134–35.
[193] *Id.* at 58135 (referencing XY, LLC v. Trans Ova Genetics, LC, 968 F.3d 1323, 1330–32 (Fed. Cir. 2020)).
[194] *Id.*

The guidance also offers examples of claims reciting mental processes as within the judicial exceptions: soliciting answers to questions and displaying profiles in response; collecting information from databases and understanding the meaning of the results; and using algorithms to perform data management functions.[195]

The second example, collecting information from databases and understanding the meaning of the results, is problematic for the AI written infringement detector, because that is what the infringement detector does, although the scope of its activity in doing so far exceeds the capability of a human being using any conventional search tools.

Step 2A, Prong Two asks whether the claim integrates a judicial exception into a practical application of the exception.[196] The guidance cites In *re Board of Trustees of Leland Stanford Junior Univ.* to distinguish between improvements in the judicial exception from improvements in the implementing technology.[197] Improvements in the judicial exception do not result in Prong Two integration because they are merely improvements in the mathematical process.[198] The guidance contrasted *McRO, Inc. v. Bandai Namco Games America Inc.*, which found that claimed rules enabled the automation of animation tasks that previously could be automated.[199]

Additionally, the guidance cites other examples involving unique coding and error correction, reunification of packets comprising the same data blocks, improved polling of network nodes, and varying the way error checking is applied to data blocks.[200]

An essential touchstone for nonobviousness is to minimize preemption of knowledge —an invention is more likely to be patentable if it does not broadly preempt all the different ways that might be developed in the future of meeting a need.[201] The infringement detector claims also should not be framed so broadly that they shut off experimentation and contemplation of newer, different, and perhaps better ways of searching for infringement.

The AI-drafted infringement detector patent application is an application for a patent on a "business method." Business methods are abstract ideas, within judicial exceptions to

[195] *Id.* at 58136.
[196] MPEP § 2106.04(d) (9th ed. Rev. 01. 2024, Nov. 2024).
[197] *Id.* at 58137 (referencing In re Board of Trustees of Leland Stanford Junior Univ., 989 F.3d 1367, 1370, 1373 (Fed. Cir. 2021)).
[198] MPEP § 2106.04(d) (9th ed. Rev. 01. 2024, Nov. 2024).
[199] *Id.* (referencing McRO, Inc. v. Bandai Namco Games America Inc., 837 F.3d 1299 (Fed. Cir. 2016)).
[200] *Id.* at 58137–38 (referencing MPEP §§ 2106.04(d)(1), 2106.05(a) (9th ed, Rev. 01.2024, Nov. 2024)).
[201] *See* Mayo Collaborative Servs. v. Prometheus Laboratories, Inc., 566 U.S. 66, 85 (2012) (In explaining why the Court set aside Samuel Morse's claims to all forms of electrical communication the Court stated: "The Court has repeatedly emphasized this last mentioned concern, a concern that patent law not inhibit further discovery by improperly tying up the future use of laws of nature."); SmartGene, Inc. v. Advanced Biological Laboratories, SA, 555 Fed.Appx. 950, 955 (Fed. Cir. 2014) (characterizing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.,* as representing concern about "preempting public use of certain kinds of knowledge . . . .").

patent eligibility, unless they are integrated with an inventive concept.[202] Business method patents and claims for them exploded after the *State Street Bank* decision,[203] and the spread of e-commerce.[204] For a time, the largest single class of patent applications was Class 705, covering business methods and financial services patents.[205]

Much criticism ensued, and the USPTO instituted a number of measures to improve the examination of business method patent applications.[206] The allowance rate for business method patents dropped sharply.[207] One recent study explained that the word-length of claims is inversely correlated with claim breath, and that higher quality patents have narrower claims.[208] By this measure, the study concluded that the USPTO initiatives increased the word-count of independent claims in business method patents, indicating greater stringency in examination.[209]

In 2022, the allowance rate for business method patent applications was running about 34%, approximately where it was before the *Alice* decision.[210] After *Alice*, it dropped precipitously to 6.2% but has slowly recovered.[211] This is somewhat lower than the rate for other technology centers.

Even if the ChatGPT drafted infringement detector invention involves a business method it does not make any categorical difference in its eligibility for a patent.

Analysis of recently granted patents involving artificial intelligence, and recent PTAB cases reinforce the touchstones illuminated by the recent USPTO guidance.[212] Patent examiners are allowing patents for AI inventions that particularize how they advance the art, and the PTAB opinions make coherent distinctions between patentable AI and

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[202] *See* buySAFE, Inc. v. Google, Inc., 765 F.3d 1350, 1355 (Fed. Cir. 2014) (finding claims to guarantee performance on online transactions invalid).
[203] *See* State St. Bank & Tr. Co. v. Signature Fin. Grp., Inc., 149 F.3d 1368, 1375 (Fed. Cir. 1998) (holding that no "business method" exceptions to patentability exists).
[204] Teruki Amano, *The Effect of the USPTO's Quality-Improving Initiatives in 2000 on the Claim Scope of Business Method Patents*, 29 TEX. INTELL. PROP. L. J. 67, 70 (2021) (reporting on empirical study of business method patent quality, based on word length of claims, after USPTO improvement initiatives).
[205] Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp*, 58 EMORY L. J. 181, 196 (2008) (reporting on detailed analysis of application, abandonment, grant statistics by patent class and by industry).
[206] Amano, *supra* note 204; s*ee also* USPTO, A USPTO WHITE PAPER: AUTOMATED FINANCIAL OR MANAGEMENT DATA PROCESSING METHODS (BUSINESS METHODS) (2000).
[207] Amano, *supra* note 204, at 71.
[208] *See id.* at 71–83.
[209] *Id.* at 81; Lemley & Sampat, *supra* note 205, at 201.
[210] *Business Methods: Business Methods Allowance Rate (Published 2022)*, USPTO (2022), https://www.uspto.gov/patents/basics/essentials/business-methods.
[211] *Id.*
[212] *See* Nikola L. Datzov, *The Role of Patent (In)Eligibility in promoting Artificial Intelligence Innovation,* 92 UMKC L. REV. 1, at 41–42 (2023) (summarizing numerous studies as supporting conclusion that AI patenting activity is flourishing both in the U.S. and globally).

purported AI that represents little more than a collection of known algorithms and techniques.

Nikola Datzov,[213] a professor of law, suggests considering patent eligibility with respect to three layers:[214]

- The data layer, including training databases, testing and validation data, and production input and output data.[215]
- The application (software) layer, including deep-learning algorithms, (she says,[216] but her explanation relates more to traditional if-then procedural programming than to machine learning).
- The system (hardware) layer, comprising computer processors, memories, input-output devices, voice-to-text translators, fingerprint scanners, and humanoid robots.[217]

Datzov further states that: "The argument for patent ineligibility of data layer AI inventions is likely the strongest of all three layers."[218] Nevertheless, methods for collecting, organizing, storing, manipulating, and presenting data may be patent eligible.[219]

The biggest barrier to patent eligibility for Datzov's application layer is that so much of AI software emulates human behavior, which squarely triggers the abstract idea judicial exception under *Alice/Mayo* 2A Prong 1.[220] To achieve eligibility under Part 2A Prong 2 or Part 2B, patent claims must describe "*how* to mimic human behavior rather than attempting to broadly capture mimicking some human behavior through software in functional terms (i.e., broad functional claiming). . . . claim language with sufficient specificity [is essential]. . . . the claim language [must focus on] how the invention is performing the activity or making the decisions, rather than just what function or objective they are looking to solve."[221]

Datzov's third category—AI hardware systems—are "squarely within the scope of patent eligible subject matter."[222] But, Datzov says, "Unlike AI inventions that invent a new sensor, a new camera, or a new microphone, AI inventions that rely on existing hardware can often be characterized as utilizing well-understood and conventional

[213] *Id.* (urging caution in amending patent law to relax the *Alice/Mayo* requirements in order to promise more innovation in AI).
[214] *Id.* at 24–25.
[215] *Id.* at 25.
[216] *Id.* at 25–26.
[217] *Id.* at 26; *see also* WIPO, PATENT LANDSCAPE REPORT: GENERATIVE ARTIFICIAL INTELLIGENCE 16 (2007) (reporting that AI patents can be addressed to (1) computer programs used, or models; (2) type of input of output, or modes; or (3) applications of generative AI).
[218] Datzov, *supra* note 212, at 27.
[219] *Id.*
[220] *See supra* Part VI.C discussion of *Alice/Mayo* test.
[221] Datzov, *supra* note 212, at 28–29 (internal footnotes omitted).
[222] *Id.* at 29–30.

technology, and as such, the hardware components of such claims fade into the background."[223]

The USPTO guidance, combined with its jurisprudence in deciding patentability of AI inventions, define a narrow channel for eligibility. Claims should not use poisonous terms such as reciting mathematical steps, mental processes, or organization of human activity, which would trigger a judicial exception in the first place. If a judicial exception is involved, which is likely, claims must be detailed enough about the concrete techniques for using and deploying AI to satisfy the requirements for an inventive concept under *Alice/Mayo* Step 2A Prong 2 or Step 2B. Jon Grossman, of Blank Rome LLP, offers suggestions on how to deal with the dilemma.[224]

The application for a generative AI enabled patent infringement detector was assigned to Examiner Michael C. Young, who has 10 years of experience.[225] He has been rated as one of the most difficult patent examiners, in the 95th percentile of difficulty, with only an 18% grant rate of 125 applications.[226] Mr. Young was, however, a model of helpfulness in the interview, explaining why examiners have faced so much uncertainty applying the *Alice/Mayo* eligibility requirements and making a number of useful suggestions on how the applicant might respond to the non-final rejection.

In January 2025, Mr. Young rejected the application generated with the aid of ChatGPT on 35 U.S.C. § 101 eligibility grounds.[227] The examiner made no comment on the role of generative AI in designing the invention or writing the application, matters which the author disclosed.[228]

The examiner found that claims 1–16 recite "an abstract idea consistent with the 'mental process' grouping set forth in the see MPEP 2106.04(a)(2)(III)."[229] Alternatively, the examiner found that the "claims recite certain methods of organizing human activity

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[223] *Id.* at 30.

[224] Jon Grossman, *AI Inventions and Subject Matter Eligibility*, INTELL. PROP. & TECH L. J., Nov. –Dec. 2023, at 1, 7–8. He makes four concrete suggestions:

> A. Draft a claim that recites the specific function(s) or the improvement(s) explicitly tied to the AI features.
> B. Draft a claim explicitly reciting the AI technology.
> C. Draft a claim and a specification that do not merely improve the abstract idea of the claimed AI technology, but can directly associate the AI technique with improved hardware performance.
> D. Draft a specification that discloses and supports hardware tied to the claimed AI technology not in terms of listing that hardware as generic components but as an improvement or a solution for a problem tied to the performance of such components. *Id.* at 7.

[225] *Examiner Young Michael*, PATENTBOTS makes four concrete suggestions, https://www.patentbots.com/stats/examiner/3626-YOUNG-MICHAEL-C (last visited Mar. 19, 2025).

[226] *Id.*

[227] Michael C. Young, Office Action Summary, Patent Application No. 18/950,464 (Jan. 28, 2025) (non-final rejection of all claims) [hereinafter First Office Action].

[228] *See infra* Appendix Part I.I (copy of author's AI disclosure filed with USPTO).

[229] First Office Action, *supra* note 227, at 5.

such as legal interactions, risk assessment, and fundamental economic practices[,]" and referenced MPEP 2106.04(a)(2)(II).[230]

The examiner found that the "application fails to integrate the judicial exception into a practical application because the instant application merely recites words 'apply it' (or an equivalent) with the judicial exception or merely includes instructions to implement an abstract idea."[231] Furthermore, the examiner stated that "[t]he computing elements are only involved at a general, high level, and do not have the particular role within any of the functions but to be a computer-implemented method using a generically claimed 'processor' and 'memory' and even basic, generic recitations that imply use of the computer such as storing information via servers would add little if anything to the abstract idea."[232]

For the same reasons, the examiner concluded that "claims 1-16, [do] not contain any additional elements that individually or as an ordered combination amount to an inventive concept and the claims are ineligible[]" under Step 2B.[233]

In a telephonic interview held on February 10, 2025 the examiner and the author focused on the 35 U.S.C. § 101 eligibility rejections. The examiner explained that all examiners struggle with applying the *Alice/Mayo* test and suggested that the author emphasize in his remarks accompanying a request for reconsideration the relationship of the invention to Claims 2 and 3 in USPTO's Example 47.[234]

Working from the non-final rejection and from the interview, the author let the several AI engines write most of the response. The degree of interactivity and the intensity of the author's prompts were greater in this stage of patent prosecution than in the drafting of the original application. The author submitted an Interview Summary, Amendment, and Reply Under 37 C.F.R. § 1.111 on February 11, 2025.

D. Is It Anticipated?

If the AI drafted application for an infringement detector is eligible subject matter, and if it had a human inventor, it nevertheless may be unpatentable because it is anticipated or obvious. It may be anticipated by other pending or issued patents or by non-patent references including this law review article.

[230] *Id.* at 6.
[231] *Id.* at 7.
[232] *Id.* at 7–8.
[233] *Id.* at 9.
[234] *See* USPTO, JULY 2024 SUBJECT MATTER ELIGIBILITY EXAMPLES 2–13 (2024), https://www.uspto.gov/sites/default/files/documents/2024-AI-SMEUpdateExamples47-49.pdf.

I. By Patent Literature?

The following patent references are likely to raise 102 anticipation and 103 obviousness questions for the ChatGPT drafted infringement detector.

First, US 7,801,909, granted to Alexander I. Poltorak, on Sep. 21, 2010, involves parsing patent claims to search for documents containing similar terms by submitting resulting queries to chatrooms.[235] Claims 13–15 involve using meta search engines and searching manufacturer websites and repositories of advertisements, product reviews, and distributor information.[236] Additionally, US 7,296,015, also granted to Alexander I. Poltorak, on Nov. 13, 2007, has similar claims.[237] But the claims of both the Poltorak patents are limited to terms-and-connectors and word proximity searches, and none of the claims involve the use of generative AI.[238] The lack of generative AI elements in these patents negates their anticipatory effect.

Second, US 7,333,984, by Gary Martin Costa, which expired on August 7, 2021, involved using an exemplar document to provide key words for a search of a predefined universe of documents.[239] Key-word lexical searching is quite different from the semantic searching enabled by generative AI, so this reference will likely not make the AI infringement detector obvious.

Third, US 9,633,005, invented by Tatlana Danielyan et al., granted Apr. 25, 2017, describes natural language processing using semantic descriptions.[240] It is relevant, but does not anticipate, because it does not include all the limitations of the ChatGPT claims.

Finally, US 11,140,115, invented by Laszlo Lukas, granted Oct. 5, 2021, is a method for classifying messages based on semantic analysis of word pairs.[241] Likewise, the underlying technology is relevant, but the reference does not anticipate.

None of these references anticipates the ChatGPT draft. Collectively they raise plausible obviousness questions, however.

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[235] *See generally* Apparatus and Method for Identifying and/or for Analyzing Potential Patent Infringement, U.S. Patent No. 7,801,909 (filed Sep. 18, 2003).
[236] *Id.* at col. 28 l. 16–28.
[237] *See generally* Apparatus and Method for Identifying and/or for Analyzing Potential Patent Infringement, U.S. Patent No. 7,296,015 (filed Feb. 14, 2003).
[238] *See id.* at col. 27–34; Apparatus and Method for Identifying and/or for Analyzing Potential Patent Infringement, *supra* note 235, at col. 27–34.
[239] *See generally* Methods for Document Indexing and Analysis, U.S. Patent No. 7,333,984 (filed Mar. 8, 2005).
[240] *See generally* Exhaustive Automatic Processing of Textual Information, U.S. Patent No. 9,633,005 (filed Oct. 8, 2014).
[241] *See generally* Systems and Methods of Applying Semantic Features for Machine Learning of Message Categories, U.S. Patent No. 11,140,115 (filed Dec. 9, 2014).

II. Does This Law Review Article Anticipate?

This law review article surely would anticipate an application filed with its content, except that an application filed within one year of the publication of the article falls within the grace period of 35 U.S.C. § 102.[242]

E. Is It Obvious?

The references cited in Part VI.D.I support obviousness objections that must be overcome. But the use of AI to generate the application raises broader obviousness possibilities.

I. Is Anything Generated by AI Per Se Obvious?

Does the fact that generative AI was able to synthesize the new invention from knowledge already available to its machine learning mean that anything AI comes up with is obvious? The focus of this article is on AI as an inventor. But the expanded capabilities of generative AI as a search engine also present other challenges for patent prosecution. The machine learning and semantic pattern matching involved in execution of generative AI prompts reveals vastly more material potentially pertinent to patentability then can be uncovered by traditional searching, including conventional Boolean terms-and-connectors searching or natural language searches that make only limited use of deep semantic trees.

The volume of potential prior art references significantly enlarges the possibility for obviousness determinations.

In the January 28th, 2025 first office action, the examiner cited three references supporting a 35 U.S.C. § 103 obviousness rejection.[243]

II. Is Generative AI a PHOSITA?

An obviousness analysis must consider the impact of the technology's capability on the definition of PHOSITA. One possibility is that generative AI is the new PHOSITA: if a generative AI search believes the combination of references is obvious, then that resolves the question.

Comments on USPTO's summer 2004 listening session, however, uniformly rejected the idea that a generative AI engine should be a PHOSITA. Typical was the comment by the pharmaceutical industry:

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[242] 35 U.S.C. § 102(b)(1)(A).
[243] First Office Action, *supra* note 227, at 11.

> [S]ince a PHOSITA has ordinary skill and creativity and is not seeking to innovate in the field, an AI model designed to have expert skill and to innovate in the field should not reflect the level of skill of the PHOSITA. Accordingly, except in certain AI-related technology areas, AI should not be expected to raise the level of ordinary skill in the art. For example, if there are AI tools that are commonly used and widely-available in a specific area of technology and there is a consensus among the relevant skilled persons that such AI tools are reliable and provide valid outputs, then the use and outputs of such AI tools could be considered part of the skill set of the PHOSITA, similar to how use of computers and calculators might be considered part of the skill set of the PHOSITA. However, without an affirmative and specific showing of such facts, AI tools and AI-generated content should not be considered to raise the level of ordinary skill in the art.[244]

Rather, the commentators thought that insisting on a human definition provides important advantages. This argument is a little fragile because the concept of a PHOSITA is hypothetical in the first place. Why should obviousness be circumscribed by human limitations on knowledge and imagination when those limitations can be overcome now with generative AI technology? A modern imaginary human PHOSITA may confess to himself, “I hadn't thought of that, but now that my generative AI system has suggested it, I see the potential."

IEEE, however, said that a PHOSITA need not be human:

> The PHOSITA is already hypothetical under current law, charged with knowing all the relevant prior art (available to the relevant public) and combining for section 103 if there is a good reason for combining. AI is a tool as in other prior search, computational, simulation, and visualization tools, which include Several previous generations of “AI.” Where AI makes (patentable) innovation more rapid or technology more sophisticated for the relevant field, which may be much expanded by such availability, that should be considered along with other innovation and sophistication.[245]

[244] PhRMA, Comments of the Pharmaceutical Research and Manufacturers of America in Response to the USPTO’s Request for Comments Regarding the Impact of the Proliferation of Artificial Intelligence (Jul. 29, 2024), https;//downloads.regultions.gov/PTO-P-2023-0044-0052/attachment_1.pdf.

[245] IEEE-USA, In re: IEEE-USA’s response to Request for Comments Regarding the Impact of the Proliferation of Artificial Intelligence (Jul. 22, 2024), https;//ieeeusa.org/assets/public-policy/policy-log /2024/072224.pdf.

III. AI Generated Equilibrium

The obviousness rejections in the experiment reinforce Professor Robin Feldman's conclusions that AI is likely to shrink the pool of inventions eligible for patenting.[246] Feldman explains how AI necessitates reconceptualization of the PHOSITA,[247] and significantly expands the reach of obviousness analysis:

> [A] PHOSITA with AI in hand will substantially raise the bar for what counts as nonobvious for all invention. In doing so, the march of modern AI will increasingly shrink the possibilities for invention. . . . It reduces the capacity of inventions to survive scrutiny by amping up the ability to find and combine far-flung and disparate pieces of prior art. This will demonstrate the obviousness of many claimed inventions, rendering them unpatentable and shrinking the space for innovation. That shrinking capacity will increase over time as the capacity of AI systems advance. Although the impact will fall both on invention created with the help of AI and without, the space for human innovation will experience the greater contraction.[248]

Feldman's focus is on the use of AI in testing obviousness, not on the likelihood that AI will come up with obvious patent applications—the problem encountered in the experiment. But the phenomena are essentially the same. An AI co-inventor is relying on prior art to invent and to describe the invention and application, and its reach in that regard is extremely broad.

Feldman seems to lament the redefinition of a PHOSITA to include AI engines or to a person using AI.[249] Feldman states that this will shrink the universe of inventions.[250] But, actually it will not shrink the universe of inventions directly; at most it will shrink the universe of patentable inventions and the number of patents granted. But two responses can be made to Feldman's concern. First, if AI PHOSITAs are so much more omniscient than human PHOSITAs, the status quo, pre-AI, is that many "inventions" were granted patents even though they were obvious, because their obviousness was hidden behind a wall of ignorance.

Second, AI will not only be a PHOSITA, it also will be a de-facto co-inventor, as this article and its experiment show. AI co-inventorship will expand the number of inventions seeking patents, perhaps greatly. So it may be a good thing that AI as a PHOSITA will be a restraint on the possibility that AI can flood the world with new and marginally useful patents.

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[246] *See* Robin Feldman, *Artificial Intelligence and Cracks in the Foundation of Intellectual Property*, 76 HASTINGS L. J. 47, 79 (2024) (exploring impact of AI on definition of PHOSITA).
[247] *Id.*
[248] *Id.* at 83–84 (internal citations omitted).
[249] *Id.* at 81.
[250] *Id.* at 83.

F. Does It Satisfy 35 U.S.C. § 112?

Rowan Patents analytics engine found thirteen antecedent basis issues, thirteen unsupported claim terms, and no claim order or format issues.[251] The author fixed the 35 U.S.C. § 112 issues in the submitted patent application.

G. How Should It be Amended Before Submission to the USPTO?

As noted, on November 13th, 2024, the author asked ChatGPT to design "a generative AI system to search for and identify products and services that potentially infringe on a patent."

ChatGPT responded with an 899-word description of system components and method steps. The author prompted, "write the claims for a patent that does this." ChatGPT responded with two independent and eleven dependent claims.

The author reviewed the ChatGPT-generated drafts and considered a number of issues:

- What 35 U.S.C. § 102 anticipation and 35 U.S.C. § 103 obviousness problems were apparent and how could they be alleviated?
- How could the claims be sharpened so that they emphasize new techniques of natural language processing, searching and matching, especially those involving deep semantic trees, rather than the prior art of terms, connectors, and natural language searches?
- Do the claims adequately cover Doctrine of Equivalents infringement? If not, how should the author expand them?
- Where are the claim limitations adequately developed in the description?
- What drawings should the author create?
- What 35 U.S.C. § 112 problems identified by Rowan Patents Analytics should the author fix?

The author found the AI drafted description a bit sparse, compared, for example, with the more extensive analysis presented in this article. The author prompted ChatGPT, "make the specification you drafted for the patent more detailed and quadruple its length." The author cut-and-pasted from the result into the originally drafted specification and scrutinized the expanded specification language to identify needs for further elaboration

[251] *See infra* Appendix H.

The author decided, at minimum, to elaborate on the embedding based similarity model, to elaborate on the scenarios, and to move the fine-tuned options features out from under the optional category into the basic description.

The original AI generated draft of the patent application gave a short shrift to Doctrine of Equivalents analysis, but any comprehensive infringement analysis should include the possibility of infringement under the Doctrine of Equivalents. That caused the author to ask ChatGPT to revise Claim 1 to include touchstones of the Doctrine of Equivalents infringement, and the result is presented in appendix VIII.F.

The author prompted ChatGPT to make three major changes in the application. First, he asked for a longer and more elaborate description. Second, he asked for a more detailed description of Doctrine of Equivalents searching. Third, he asked for a more specific linkage to specialized hardware.

The author then prompted ChatGPT: "Write a two-paragraph description of the Doctrine of Equivalents supporting the claims, including a discussion of the function-way-result test and its application and the insubstantial differences test and its application." Chat GPT responded with the material presented in appendix VIII.G, which satisfied the author.

The author struggled to come up with some hardware implementation of the infringement detector that would buttress its 35 U.S.C § 101 eligibility under the *Alice/Mayo* Step 2A Prong 2 and Step 2B. Merely running the various modules on a general purpose computer is not enough, and, it appears, especially under the recent Federal Circuit decision, *IBM v. Zillow Group, Inc.*,[252] that implementation of an innovative user interface is not enough. Using unusual types of network connections to tap databases for the smorgasbord module or innovative ways of constructing the neural networks and semantic trees with accelerator chips would be useful in this regard. The author prompted ChatGPT: "link this patent application more tightly to hardware and device innovations to increase its eligibility for a patent," and cut and pasted ChatGPT's response into the original claims and specification produced by generative AI and modified the drawings accordingly. The author confirmed that each type of hardware component exists and performs the function described, including the natural language processing accelerator, the memory management unit, the similarity matching accelerator, the tensor processing unit, the generative inference module implemented on a field programmable gate array, and a heat map visualization chip.

The hardware-integrated version had a Rowan Analytics eligibility score slightly above the middle.[253]

[252] Int'l Bus. Machs. Corp. v. Zillow Grp., Inc., No. 2022-1861, 2024 WL 89642 at *1, *1–*6 (Fed. Cir. 2024) (affirming finding that a patent for an improved interface was ineligible under Alice/Mayo).
[253] Information from the author's Rowant Patents Analytics report from February 27th, 2025.

The author added some definitions where he found terms used in the AI draft potentially ambiguous.

The author's involvement in reviewing and revising the initial AI-generated application exceeds what USPTO's Example 1, Scenario 3 found to qualify for human inventorship.[254]

In reviewing and revising the AI output, the author was careful to preserve as much of the original AI-created draft as he thought could pass muster in prosecution. In many cases, he was uneasy with the style, syntax, and content, but he confined himself to the minimum revisions he thought necessary. When he thought additional elaboration was required in the description, he asked ChatGPT for it instead of coming up with it on his own. With respect to those revisions the author's inventorship contributions comprised identifying the problem in framing a prompt to cause ChatGPT to fix it.

The author filed the application, designated U.S. Patent Application No. 18/950,464, on November 18th, 2024,[255] accompanied by a disclosure of the relationship between ChatGPT's contributions and his human contributions, basically summarizing the content of this section.

VII. Fate of the Application and Conclusions to be Drawn

The application was the subject of a final rejection on March 17th, 2025.[256] Excerpts of the rejection are reproduced in appendix VIII.J.

The author reviewed the final rejection and decided to let the application go abandoned. The author was not optimistic that he could write arguments that would be persuasive on appeal, let alone that he could prompt the AI engines to write such arguments. And, after all, the purpose of the experiment was to test inventorship with AI involvement, not to explore the boundaries of eligibility.[257]

The experiment supports three conclusions. First, a substantial amount of AI engine involvement in designing an invention in writing an application is not disqualifying, if a human inventor provides substantive direction and discloses the details of the interaction along with filing the application. The progress of the application shows how

[254] *See supra* Part VI.B (reviewing USPTO examples of inventorship in context of AI aided applications).
[255] System and Method for Detecting Patent Infringement, U.S. Patent Application No. 18/950,464 (filed Nov. 18, 2024).
[256] Examiner Michael C. Young, Office Action Summary Application No. 18/950,464 (Mar. 17, 2025) (final rejection of all pending claims).
[257] *See* Henry H. Perritt, Jr., *Undressing AI: Transparency Through Patents*, 33 TEXAS INTELL. PROP. L. J. 137, 167–80 (2024) (analyzing eligibility of AI inventions under 35 U.S.C. § 101 and *Alice/Mayo*).

collaboration between a human inventor and a generative AI engine can be calibrated so as to satisfy the inventorship requirement of the patent law.[258]

Second, use of AI tools tends to invite eligibility rejection, because of the AI engines' love for generalities, but the eligibility rejection in the experiment is primarily the author's fault for selecting a business method for the experiment. That the prosecution encountered difficulty on 35 U.S.C. § 101 eligibility is not surprising because this invention, like many instances of AI, uses AI to automate human activities using computerized methods. As the examiner interview in this case illustrates, it is challenging for an inventor to establish eligibility of an AI invention under the *Alice/Mayo* test.[259]

Third, as Part VI.E explains, the way in which a generative AI engine designs an invention and writes an application inherently presents the possibility of obviousness.[260]

For a follow-on experiment, it would be interesting to select the mechanical arts field, where the algorithm and business-method problem of 35 U.S.C. § 101 eligibility is less.

VIII. Appendices

A. AI Generated Concept

On November 13, 2024, the author asked ChatGPT to design "a generative AI system to search for and identify products and services that potentially infringe on a patent."

ChatGPT responded:

> Designing a generative AI system to search for and identify products and services that potentially infringe on a patent involves combining generative and analytical AI models with specialized search tools, NLP capabilities, and domain-specific knowledge bases. Here's a structured approach to designing such a system:
>
> **System Overview**
>
> The goal is to create a **Generative Patent Infringement Identifier** that can automatically parse patent claims, understand their technical scope, and search for relevant products or services that may overlap with the patented technology. The system will use a combination of natural language processing (NLP), information retrieval, machine learning

[258] *See supra* Part VI.B.
[259] *See supra* Part VI.C.
[260] *See supra* Part VI.E.

models, and generative AI to infer potential matches and analyze their likelihood of infringement.

Key Components and Workflow

1. **Patent Parsing and Analysis Module**

   Objective: Parse the patent document, specifically the claims section, to extract and understand technical requirements.

   Process:

   - **OCR/Text Extraction**: If the patent is a PDF or image, use OCR to extract the text.
   - **NLP Parsing**: Use NLP models (e.g., BERT, GPT) fine-tuned on legal and technical language to parse and interpret claims.
   - **Technical Element Extraction**: Identify key technical elements, processes, or configurations in each claim. This could include hardware specifications, algorithm descriptions, physical configurations, and other specific details.
   - **Feature Modeling**: Create structured representations of the extracted features (e.g., using knowledge graphs or vector embeddings) to enable precise matching.

2. **Product and Service Data Retrieval Module**

   Objective: Retrieve a comprehensive set of data on commercial products and services that may intersect with the technology described in the patent.

   Data Sources:

   - **Product Databases**: Integrate with databases like Amazon, Alibaba, and industrial product databases.
   - **Market Reports and Catalogs**: Use databases such as Gartner, Statista, or industry-specific market research.

- **Technical Documentation**: Access technical specs, whitepapers, and product documentation from manufacturer websites.

Search Algorithms:

- Use semantic search models (e.g., BERT-based retrieval systems) to match product descriptions with the technical features from the patent claims.

- Implement web scraping and API integration to pull data from e-commerce platforms and product aggregators.

3. **Similarity Matching and Scoring Engine**

Objective: Match the extracted features from the patent claims with retrieved product descriptions to assess similarity and potential overlap.

Techniques:

- **Embedding-Based Similarity**: Convert both patent claim features and product descriptions into embeddings, then use cosine similarity to score matches.

- **Rule-Based Filters**: Apply rule-based filtering for specific terms (e.g., "wireless communication device" or "encrypted data") to enhance precision.

- **Scoring and Ranking**: Generate a similarity score for each match and rank products/services based on their likelihood of infringement.

4. **Generative Inference Module**

Objective: Generate potential modifications or hypothetical scenarios to test the patent scope against new or modified products.

Techniques:

- **Generative Language Models (e.g., GPT)**: Use a generative model to hypothesize modifications to existing

products that would still likely infringe on the patent claims. For example, it might suggest a product with a slightly altered configuration but still covered under the claim's scope.

- **Scenario Testing**: Use the generated scenarios to refine searches or check edge cases where infringement is likely but not explicit.

5. **Legal Analysis and Reporting Module**

Objective: Generate an infringement analysis report for legal teams, highlighting the most probable infringing products and the technical overlap.

Features:

- **Infringement Heatmap**: Visualize the level of overlap between the patent claim features and each identified product/service.

- **Claim Mapping**: Show how each product feature matches specific claim elements (e.g., show how a product's "remote control device" feature overlaps with the patent's description).

- **Automated Report Generation**: Create a structured report with highlighted infringement risks, confidence scores, and product information.

Technology Stack

1. **NLP and Semantic Search**:

    - **Text Extraction**: Tesseract (for OCR if necessary)

    - **NLP**: BERT, GPT, or similar transformer-based models for parsing claims and product descriptions.

- **Similarity Matching**: Sentence-BERT or other embedding models for high-quality semantic similarity scoring.

2. **Data Retrieval**:

   - **Product Databases**: Access through APIs or web scraping tools (e.g., Scrapy, BeautifulSoup).

   - **Web Integration**: Use web crawlers or APIs for e-commerce and market research websites.

3. **Machine Learning and Generative AI**:

   - **Generative Models**: OpenAI's GPT, for scenario testing and hypothetical infringement cases.

   - **Classification Models**: Fine-tuned BERT models to classify potential infringers based on product descriptions.

4. **Visualization and Reporting**:

   - **Data Visualization**: Matplotlib, Plotly for heatmaps and score-based ranking visualizations.

   - **Document Generation**: Automate report creation in PDF/HTML using tools like ReportLab or Jinja templates.

Example Workflow

1. **Input**: Patent document (PDF or text) is inputted into the system.

2. **Claim Parsing**: The system parses the independent and dependent claims, extracting technical features.
3. **Product Search**: Relevant products and services are identified through keyword matching and semantic search.

4. **Similarity Scoring**: The similarity engine scores each product based on claim overlap.

5. **Generative Hypotheses**: Generate potential modifications to products to test edge cases for infringement.

6. **Report Generation**: The system compiles an infringement risk report, highlighting products and services with the highest match scores.

Potential Challenges and Solutions

Complex Claim Language: Patent claims are often complex and nuanced. Using domain-specific fine-tuning on legal and technical language for NLP models can improve accuracy.

Access to Product Data: E-commerce and industrial databases may have restricted access. API integration and partnerships can help.

False Positives in Matching: A scoring threshold or confidence-based scoring can help filter out false positives.

This generative AI system could significantly streamline the identification of potentially infringing products and services, making patent analysis faster, more accurate, and more scalable.

B. AI Generated Background of the Invention

The author prompted ChatGPT to: "write a background of the invention section for this patent."

ChatGPT responded:

Background of the Invention

In the field of intellectual property, specifically patents, infringement analysis plays a critical role in protecting the rights of patent holders and ensuring market compliance. Patent infringement occurs when a product or service employs technologies, methods, or configurations that fall within the scope of a valid patent claim. Identifying potentially infringing products or services has traditionally relied on manual analysis by patent professionals, who parse patent claims, compare technical specifications, and examine product documentation to determine infringement risks. This process is time-consuming, labor-intensive, and prone to subjective interpretation, leading to delays and increased costs for businesses and legal entities seeking to enforce their patent rights.

The rapid expansion of global markets and e-commerce platforms has further complicated patent infringement analysis. Today, products and services are introduced to the market at an unprecedented rate, with new variations and configurations continuously emerging. For patent holders, monitoring the market for potentially infringing products has become a complex challenge due to the sheer volume and diversity of available products. Moreover, products or services that may not explicitly copy patented technology can still infringe upon a patent's claims through slight modifications or alternative configurations, which are not always straightforward to identify.

Advancements in artificial intelligence (AI) and natural language processing (NLP) have created new opportunities to automate and enhance patent analysis. Specifically, generative AI models, which are capable of understanding complex language patterns, generating new content, and analyzing data at scale, present a promising solution to automate the identification of potential patent infringements. While traditional AI approaches can assist in keyword-based searches or simple feature matching, they often lack the ability to understand nuanced claim language and infer hypothetical scenarios where infringement could occur. This is especially challenging in cases where a product or service may slightly deviate from the exact language of the patent claims but still operates within the claimed scope.

In response to these challenges, the present invention introduces a system and method for identifying potentially infringing products and services using generative artificial intelligence. This invention leverages state-of-the-art NLP models trained on legal and technical language to parse patent claims, extract essential technical features, and compare them with product descriptions from a variety of databases. By employing embedding-based similarity matching and generative inference models, the system can detect not only explicit infringements but also hypothetical cases where modified configurations of products or services could still infringe on the patent.

The invention further enables automated reporting and visualization, providing patent professionals and legal entities with clear, data-driven insights on potential infringements. Through the use of a ranking and scoring system, the invention prioritizes potentially infringing products and services based on their similarity to the patent claims, enabling users to quickly assess and address the most relevant matches. The generative inference capability also allows the system to propose alternative product configurations, supporting the identification of edge cases that traditional systems may overlook.

> The proposed invention addresses the growing need for efficient, scalable, and precise tools in patent enforcement, reducing the manual burden on legal professionals and providing patent holders with a powerful, proactive method for safeguarding their intellectual property. This automated approach to patent infringement identification represents a significant advancement in the field, empowering users with faster, more comprehensive insights and enhancing the overall effectiveness of patent protection in a rapidly evolving marketplace.

C. AI Generated Claims

The author then prompted ChatGPT: "write the claims for a patent that does this."

ChatGPT responded:

> Here's a draft for a set of claims for a patent covering a generative AI system designed to search for and identify products and services that may infringe on a patent:
>
> **Title: System and Method for Identifying Potential Patent Infringements Using Generative Artificial Intelligence**
>
> **Independent Claims**
>
> **1. A system for identifying products or services potentially infringing a patent, comprising:**
>
> - a **patent parsing module** configured to receive a patent document and extract one or more claims from the patent document, wherein the patent parsing module includes:
>
> - a natural language processing (NLP) model trained to interpret legal and technical language within the patent claims;
>
> - an element extraction unit to identify and categorize technical features, components, and processes described in the claims;

- a **data retrieval module** configured to search and retrieve descriptions of existing products and services from one or more databases, the data retrieval module comprising:
    - a semantic search engine trained to identify similarities between the patent claims and the retrieved descriptions of products or services;
    - an information retrieval algorithm configured to prioritize data sources based on relevance to the technical field of the patent;
- a **similarity matching module** configured to compare the extracted technical features from the patent document to the retrieved descriptions of products or services, wherein the similarity matching module includes:
    - an embedding-based similarity model for calculating a similarity score between the technical features of the patent and the product or service descriptions;
    - a scoring and ranking algorithm that ranks the retrieved products or services based on their potential to infringe on the patent;
- a **generative inference module** configured to hypothesize potential modifications to the retrieved products or services based on the claims, wherein the generative inference module includes:
    - a generative language model that creates hypothetical scenarios in which the product or service may infringe on the patent;
    - a scenario testing unit to analyze the likelihood of infringement in each hypothetical scenario;
- a **reporting module** configured to generate an infringement analysis report based on the ranked list of products or services, the similarity scores, and any hypothetical infringement scenarios, wherein the report highlights specific claim elements matched with product or service features.

2. The system of claim 1, wherein the data retrieval module further comprises an e-commerce integration interface configured to access product data from commercial product databases, technical documentation repositories, or market research databases.

3. The system of claim 1, wherein the similarity matching module further comprises a rule-based filter configured to identify specific keywords and technical terms in the claims that have a high correlation with potential infringement.

4. The system of claim 1, wherein the reporting module generates a heatmap visualizing the overlap between the patent claim elements and the identified product or service features, wherein the heatmap visually indicates the strength of similarity for each matched feature.

5. The system of claim 1, wherein the generative inference module includes a fine-tuned transformer-based model configured to analyze alternative configurations of product features that may still potentially infringe the patent claims.

Dependent Claims

6. The system of claim 1, wherein the patent parsing module further comprises a text extraction sub-module configured to perform optical character recognition (OCR) on patent documents provided as scanned images.

7. The system of claim 1, wherein the NLP model of the patent parsing module is fine-tuned on legal and technical language specific to one or more industries, including telecommunications, software, electronics, or biotechnology.

8. The system of claim 1, further comprising a user interface configured to allow a user to input additional filters or parameters for refining the search results of potentially infringing products or services, including keywords, categories, or technical specifications.

9. The system of claim 1, wherein the reporting module includes a confidence scoring algorithm to provide a likelihood estimate of infringement based on the similarity score and the match between claim elements and product features.

10. A method for identifying potential patent infringements, comprising:

- receiving a patent document and extracting one or more claims from the document;
- parsing the claims to extract technical features, components, or processes described therein;
- retrieving product or service descriptions from one or more external databases;
- comparing the extracted technical features to the retrieved product or service descriptions using an embedding-based similarity model;
- generating a ranked list of products or services based on similarity to the patent claims;
- generating hypothetical scenarios with a generative inference module to test alternative configurations of products or services against the patent claims;
- generating a report that indicates potential infringements, including a heatmap of feature overlap and a likelihood estimate for each identified product or service.

Optional Dependent Claims for Method

11. The method of claim 10, further comprising applying a rule-based filter to prioritize technical terms in the claims that have a high likelihood of matching with potentially infringing products or services.

12. The method of claim 10, wherein the generative inference module utilizes a transformer-based language model to generate alternative product configurations that still match the patent claim scope.

13. The method of claim 10, further comprising displaying the generated report in a user interface with interactive visualization tools, including a heatmap and ranked scoring of potential infringers.

This set of claims defines a system and method for identifying potential patent infringements using generative AI, specifically covering the core functional modules, technical specifics, and optional features that enhance functionality. Let me know if you'd like adjustments or expansions on any particular aspect.

D. AI Generated Specification

The author asked ChatGPT to "write a specification for these patent claims."

ChatGPT responded:

Field of the Invention

The present invention relates to systems and methods for identifying products or services that may infringe upon a given patent. Specifically, it pertains to a system utilizing natural language processing (NLP), information retrieval, and machine learning techniques to compare patent claims with descriptions of existing products or services, calculate similarity scores, generate hypothetical infringement scenarios, and produce detailed reports on potential patent infringements.

Background of the Invention

Patent holders face significant challenges in identifying instances of infringement due to the complex language used in patent claims and the vast number of products and services available on the market. Traditional approaches to infringement analysis require extensive manual effort and are prone to oversight. Automated systems for patent analysis typically lack the capability to interpret technical language effectively or to hypothesize potential infringements based on modifications to existing products. There is a need for a sophisticated system that can parse patents, retrieve relevant product descriptions, compare technical features, hypothesize potential modifications, and generate comprehensive reports to streamline the patent enforcement process.

Summary of the Invention

The invention provides a system and method for identifying products or services potentially infringing on a patent. The system includes various modules configured to parse patents, retrieve data, match similarities,

infer hypothetical infringement scenarios, and generate reports. The invention leverages NLP models, semantic search, embedding-based similarity, and generative language models to improve the accuracy and relevance of patent infringement analysis.

Detailed Description of the Invention

1. System Overview

The system comprises a series of modules that function cooperatively to analyze patent documents, retrieve and compare descriptions of existing products or services, and generate a report of potential patent infringements. Each module is described in detail below.

2. Patent Parsing Module

The patent parsing module is configured to receive a patent document, extract one or more claims, and identify technical features, components, and processes described within those claims. Key elements of this module include:

- **NLP Model**: The NLP model is trained to interpret complex legal and technical language found in patent claims, enabling accurate extraction of claim elements and features.

- **Element Extraction Unit**: This unit categorizes extracted elements into specific technical features, components, and processes relevant to the patent. It ensures structured representation for downstream analysis.

3. Data Retrieval Module

The data retrieval module is responsible for searching and retrieving descriptions of existing products and services from external databases. Components of this module include:

- **Semantic Search Engine**: A search engine trained to find similarities between patent claims and product or service descriptions, using contextual understanding of the language.

- **Information Retrieval Algorithm**: This algorithm prioritizes data sources based on relevance to the patent's technical field, ensuring that only the most relevant data is considered.

4. Similarity Matching Module

This module compares the technical features extracted from the patent document to descriptions of existing products or services. It includes:

- **Embedding-Based Similarity Model**: This model calculates similarity scores between the extracted technical features and the retrieved product or service descriptions.

- **Scoring and Ranking Algorithm**: This algorithm ranks the retrieved products or services based on their potential to infringe on the patent, providing an ordered list for reporting.

5. Generative Inference Module

The generative inference module hypothesizes potential modifications to the retrieved products or services that could lead to infringement of the patent claims. This module includes:

- **Generative Language Model**: A model that generates hypothetical scenarios, creating variations of the products or services where infringement may occur.

- **Scenario Testing Unit**: This unit assesses each hypothetical scenario for the likelihood of infringement, adding depth to the analysis.

6. Reporting Module

The reporting module compiles the findings into an infringement analysis report, detailing matched claim elements, similarity scores, and hypothetical infringement scenarios. Key features include:

- **Report Generation**: The report highlights specific claim elements matched with product or service features, providing clear insights for the user.

- **Visualization Tools**: Optionally, the module can generate a heatmap visualization of the overlap between patent claim elements and product features, indicating the strength of similarity for each match.

7. Optional Components

- **E-Commerce Integration Interface**: Allows the data retrieval module to access commercial product databases, technical documentation repositories, and market research databases.
- **Rule-Based Filter**: Filters specific keywords and technical terms in claims that correlate highly with potential infringement, refining search results.

- **Text Extraction Sub-Module**: Enables OCR functionality for processing patent documents provided as scanned images.

- **Fine-Tuned NLP Model**: Trained on domain-specific language for fields such as telecommunications, software, electronics, or biotechnology.

- **User Interface**: Allows users to input additional filters or parameters, including keywords, categories, or technical specifications.

Methodology

A method for identifying potential patent infringements using the system described includes:

1. **Receiving and Parsing Patent Document**: The method begins with receiving a patent document and extracting claims.

2. **Feature Extraction**: The patent parsing module extracts technical features, components, and processes.

3. **Data Retrieval**: The system retrieves descriptions of products or services from external databases.

4. **Similarity Calculation**: Extracted features are compared to product descriptions using an embedding-based similarity model.

5. **Ranking**: The system generates a ranked list of products or services based on their similarity to the patent claims.

6. **Hypothetical Scenarios**: The generative inference module creates alternative configurations of products or services for further testing.

7. **Report Generation**: A report is generated, featuring similarity scores, hypothetical infringement scenarios, and a heatmap visualization of overlaps.

E. AI Generated Abstract

The author prompted ChatGPT to "write an abstract for this invention."

ChatGPT responded:

> The present invention provides a system and method for identifying potential patent infringements using generative artificial intelligence. The system includes a patent parsing module configured to extract and interpret technical features from patent claims using natural language processing, a data retrieval module that searches databases for product and service descriptions, a similarity matching module that compares these descriptions to the extracted patent features using embedding-based similarity scoring, and a generative inference module that hypothesizes alternative configurations of products or services that may still fall within the scope of the patent claims. The system generates an infringement analysis report with ranked potential infringers, confidence scores, and a visual heatmap indicating feature overlap with the claims. This invention enables patent holders and legal professionals to efficiently monitor and identify potentially infringing products or services, offering a scalable, automated approach to patent enforcement in a rapidly changing marketplace.

F. AI Generated Limitations Reflecting the Doctrine of Equivalents

On November 15, 2024, the author asked ChatGPT to "add limitations to claim 1 that involve use of the Doctrine of Equivalents to find infringement."

ChatGPT responded:

1. **A system for identifying products or services potentially infringing a patent, comprising**:

    - a **patent parsing module** configured to receive a patent document and extract one or more claims from the patent document, wherein the patent parsing module includes:

- a natural language processing (NLP) model trained to interpret legal and technical language within the patent claims;

- an element extraction unit to identify and categorize technical features, components, and processes described in the claims, wherein the element extraction unit is capable of identifying functional equivalents of extracted features to account for variations that perform substantially the same function in substantially the same way to achieve substantially the same result;

- a **data retrieval module** configured to search and retrieve descriptions of existing products and services from one or more databases, the data retrieval module comprising:

  - a semantic search engine trained to identify similarities between the patent claims and the retrieved descriptions of products or services, wherein the semantic search engine is adapted to retrieve descriptions that include variations or equivalents of identified technical features;

  - an information retrieval algorithm configured to prioritize data sources based on relevance to the technical field of the patent;

- a **similarity matching module** configured to compare the extracted technical features from the patent document to the retrieved descriptions of products or services, wherein the similarity matching module includes:

  - an embedding-based similarity model for calculating a similarity score between the technical features of the patent and the product or service descriptions, wherein the similarity score accounts for minor differences or non-literal variations between the features described in the claims and those in the product descriptions;

  - a scoring and ranking algorithm that ranks the retrieved products or services based on their potential to infringe on the patent, including those that may employ variations of the technical features that achieve the same result as those in the claims;

- a **generative inference module** configured to hypothesize potential modifications to the retrieved products or services based on the claims, wherein the generative inference module includes:
    - a generative language model that creates hypothetical scenarios in which the product or service may infringe on the patent, including scenarios where the product or service includes variations or functional equivalents of claim elements that achieve substantially the same result in substantially the same way;
    - a scenario testing unit to analyze the likelihood of infringement in each hypothetical scenario;
- a **reporting module** configured to generate an infringement analysis report based on the ranked list of products or services, the similarity scores, and any hypothetical infringement scenarios, wherein the report highlights specific claim elements matched with product or service features, including matches based on functional equivalents under the Doctrine of Equivalents.

2. Explanation of the Doctrine of Equivalents Limitations

The revised claim now includes specific language that:

- Allows the **patent parsing module** to interpret and extract equivalents of technical features.
- Modifies the **data retrieval module** to account for variations or equivalents of the extracted technical features.
- Modifies the **similarity matching module** to adjust similarity scoring to include non-literal variations.
- Enhances the **generative inference module** to create scenarios that include functional equivalents and test potential infringement cases under the Doctrine of Equivalents.

- Ensures the **reporting module** highlights equivalents, showing infringement risks even for products that do not match the claim language exactly but achieve the same result in the same way.

This approach strengthens the claim by explicitly covering scenarios in which products or services might only have minor, non-substantive differences from the claimed features, thus broadening the scope for potential infringement findings under the Doctrine of Equivalents.

G. AI Generated Doctrine of Equivalents Descriptions

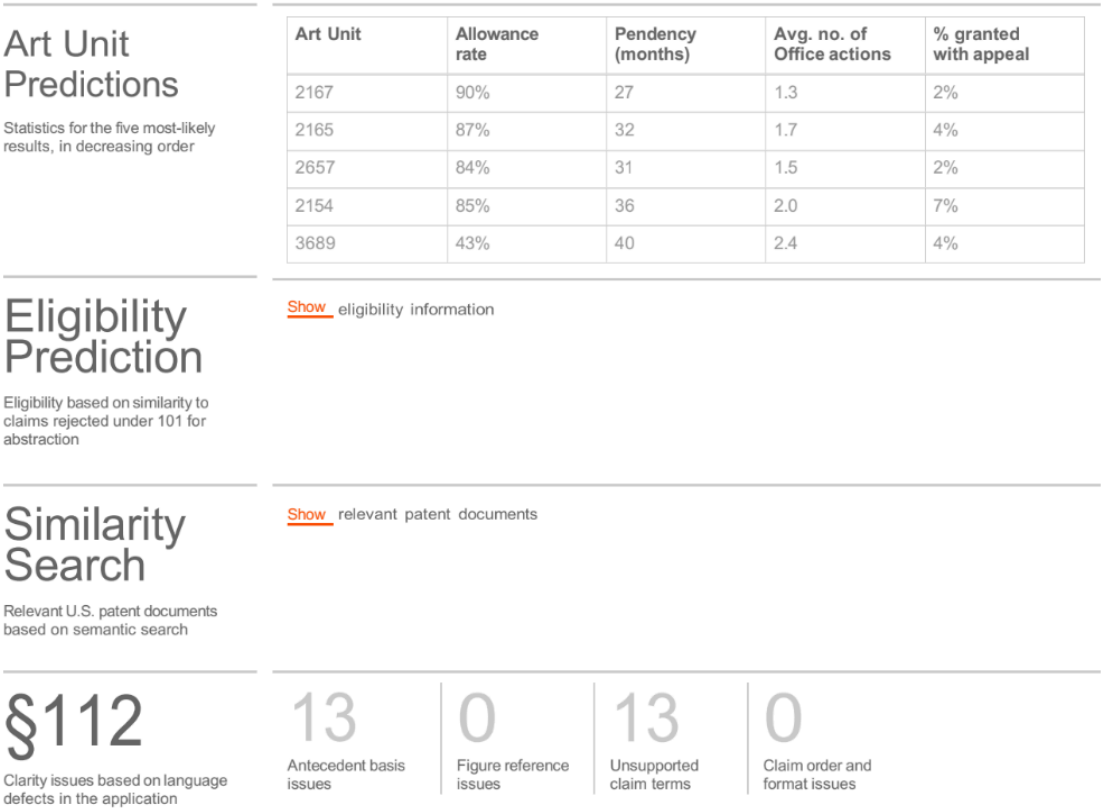
The author prompted ChatGPT to "write a two paragraph description of the Doctrine of Equivalents supporting the claims, including a discussion of the function-way-result test and its application and the insubstantial differences test and its application."

Chat GPT responded:

> The **Doctrine of Equivalents** is a legal principle in patent law that allows for a finding of infringement even when a product or process does not literally meet the specific wording of a patent claim but is nevertheless equivalent to it. This doctrine is applied when an accused product or process performs substantially the same function, in substantially the same way, to achieve substantially the same result as the claimed invention—a method known as the **function-way-result test**. Under this test, if each element in the accused device performs a function that matches the patented invention's claim element, using a method that is substantially similar and yielding an equivalent result, then infringement may be found under the Doctrine of Equivalents. The function-way-result test prevents potential infringers from evading liability by making only minor or insubstantial changes to the patented invention's language or structure.
>
> In addition to the function-way-result test, courts may apply the insubstantial differences test to determine if an accused product or process is equivalent. This test examines whether the differences between the claimed invention and the accused product or process are minor or trivial to the extent that they would be considered insubstantial by a person skilled in the art. If the differences are deemed insubstantial, then the accused device may still infringe under the Doctrine of Equivalents, even if it does not literally meet every claim element. The insubstantial differences test broadens the patent's protective scope to cover similar technologies that fall within the essence of the patented invention, thereby preventing competitors from making minor adjustments that would otherwise enable them to circumvent the patent.

In the context of the claimed generative AI system, these tests enable the system to identify products or services that may not exactly match the claim language but still perform equivalent functions in ways that achieve the same outcomes, thus identifying potential infringements that literal interpretation alone might miss.

H. Rowan Analytics Review



Art Unit Predictions

Statistics for the five most-likely results, in decreasing order

Art Unit	Allowance rate	Pendency (months)	Avg. no. of Office actions	% granted with appeal
2167	90%	27	1.3	2%
2165	87%	32	1.7	4%
2657	84%	31	1.5	2%
2154	85%	36	2.0	7%
3689	43%	40	2.4	4%

Eligibility Prediction

Eligibility based on similarity to claims rejected under 101 for abstraction

Show eligibility information

Similarity Search

Relevant U.S. patent documents based on semantic search

Show relevant patent documents

§112

Clarity issues based on language defects in the application

13 Antecedent basis issues

0 Figure reference issues

13 Unsupported claim terms

0 Claim order and format issues

Antecedent-basis issues

The following 13 antecedent basis issues were identified in the claims

Term phrase	Issue	Claim(s)
the technical field of the patent	Missing introduction	1
the technical features of the patent	Missing introduction	1
the product or service	Ambiguous term has several possible introductions	1
the likelihood of infringement in each hypothetical scenario	Missing introduction	1
the report	Ambiguous term has several possible introductions	1
the overlap	Term is introduced in a different context	4
the strength of similarity for each matched feature	Missing introduction	4
the NLP model of the patent parsing module	Missing introduction	7
legal	Term is previously introduced	7
technical language	Term is previously introduced	7
the search results	Missing introduction	8
the document	Term is introduced in a different context	10
a heatmap	Term is previously introduced	13

Claim support issues

The following 13 concepts were not described in the specification

Concept	Claim(s)
have	3 and 11
high	3 and 11
transformer	5 and 12
still	5 and 12
perform optical	6

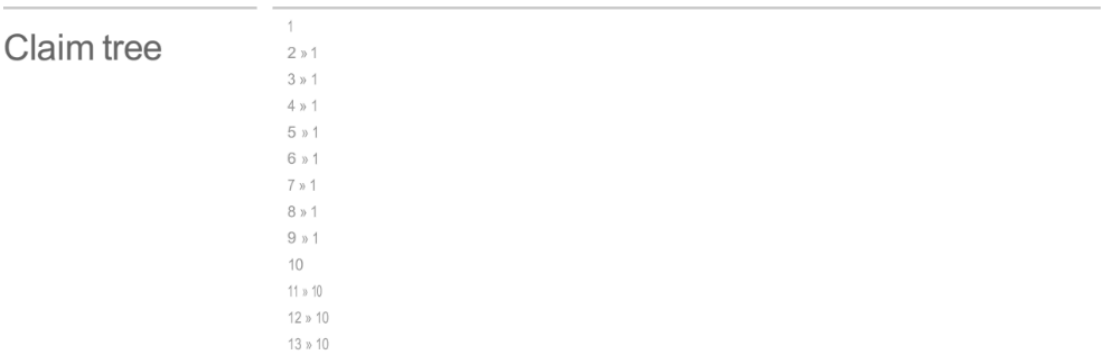
Concept	Claim(s)
industries	7
allow	8
confidence	9
estimate	9– 10
applying	11
scope	12
displaying	13
interactive	13

Claim number and format issues

Rowan analytics found no claim number and format issues

Parts list

Rowan analytics found no issues with numbered parts



I. Disclosure of AI Involvement

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: Henry Hardy Perritt Jr.	Confirmation No.: 1390
Applicant: Henry Hardy Perritt Jr.	Art Unit:
Application No.: 18/950,464	Examiner:
Filing Date: 11-18-2024	Atty. Docket: 0009

Title: **System and Method for detecting patent infringement**

Information Disclosure re Inventorship

Mail Stop Amendment

Commissioner for Patents

PO Box 1450

Alexandria, VA 22313-1450

Commissioner:

I make this disclosure pursuant to the requirements of 37 CFR § 1.56 and USPTO's *Inventorship Guidance for AI-Assisted Inventions,* 89 Fed.Reg. 10043 (Feb. 13, 2024).

On November 13, 2024, I asked the generative AI program, ChatGPT, to design "a generative AI system to search for and identify products and services that potentially infringe on a patent."

ChatGPT responded with an 899-word description of system components and method steps. I prompted, "write the claims for a patent that does this." ChatGPT responded with two independent and eleven dependent claims.

I reviewed the ChatGPT-generated drafts and considered a number of issues:

- What section-102 anticipation and section-103 obviousness problems were apparent and how could they be alleviated?
- How could the claims be sharpened so that they emphasize new techniques of natural language processing, searching and matching, especially those involving large language models and deep semantic trees, rather than the prior art of terms-and-connectors and natural-language search?
- Do the claims adequately cover Doctrine of Equivalents infringement? It not, how should they be expanded?
- Were the claim limitations adequately developed in the description?
- What drawings were necessary and should be added?
- What section-112 problems needed attention?

I prompted ChatGPT to make three major changes in the application. First, I asked for a longer and more elaborate description. Second, I asked for a more detailed description of the doctrine of equivalents searching. Third, I asked for a more specific linkage to specialized hardware. I constructed drawings and added them to the application.

I found the AI drafted description a bit sparse. I prompted ChatGPT, "make the specification you drafted for the patent more detailed and quadruple its length." I scrutinized the expanded specification language to identify needs for further elaboration

I decided, at minimum, to elaborate on the embedding-based-similarity model, to elaborate on the scenarios, and to remove the fine-tuned and options features from under the optional category and into the basic description. I asked ChatGPT for additional material on those concepts and cut and pasted them into the specification.

The original ChaptGPT-generated draft of the patent application gave short shrift to Doctrine of Equivalents analysis; yet any comprehensive infringement analysis should include the possibility of infringement under the doctrine of equivalents. That caused me to ask ChatGPT to "add limitations to claim 1 that involve use of the doctrine of equivalents to find infringement." I then prompted ChatGPT, "Write a two paragraph description of the doctrine of equivalents supporting the claims, including a discussion of the function-way-result test and its application and the insubstantial differences test and its application." Chat GPT responded, and I incorporated its response into the description section of the application.

I wanted a hardware implementation of the infringement detector that would buttress its 101 eligibility. I prompted ChatGPT: "link this patent application more tightly to hardware and device innovations to increase its eligibility for a patent," and cut and pasted ChatGPT's response into the original claims and specification produced by generative AI and modified the drawings accordingly. I confirmed that each type of hardware component exists and performs the function described, including the natural language processing accelerator, the memory management unit, the similarity matching accelerator, the tensor processing unit, the generative inference module implemented on a field programmable gate array, and a heat map visualization chip.

I added definitions where I found terms used in the AI draft potentially ambiguous.

I believe that my involvement in reviewing and revising the initial AI-generated application exceeds what USPTO's Example 1, Scenario 3, available at EXAMPLE 1: Transaxle for Remote Control Car, https://www.uspto.gov/sites/default/files/documents/ai-inventorship-guidance-mechanical.pdf, found to qualify for human inventorship.

Respectfully submitted,

/Henry Hardy Perritt, Jr./

Henry Hardy Perritt, Jr.

Inventor

J. Excerpts From Final Rejection

These excerpts are from the final rejection of the application that was mailed on March 17th, 2025.[261] *Page references are provided in bold type font.*

[Page 4] ***Claim Rejections - 35 USC § 101***

> In the instant case, claims 1, 10, 12, and 14 are directed to a hardware-integrated system and method. Thus, each of the claims falls within one of the four statutory categories (step 1). However, the claims also fall within the judicial exception of an abstract idea (step 2). While claims 1 and 12, are directed to different categories, the language and scope are substantially the same and have been addressed together below.
>
> **[Page 5]** Under Step 2A Prong 1, the test is to identify whether the claims are "directed to" a judicial exception. Examiner notes that the claimed invention is directed to an abstract idea in that the instant application is directed to mathematical calculations (see MPEP 2106.04(a)(2)(I), certain methods of organizing human activity

[261] Examiner Michael C. Young, Office Action Summary Application No. 18/950,464 (Mar. 17, 2025) (final rejection of all pending claims).

specifically commercial interactions and behaviors and managing personal behavior and/or interactions between people (see MPEP 2106.04(a)(2)(II)) and mental processes (see MPEP 2106.04(a)(2)(III).

* * *

[Page 9] Here, the claimed invention falls within the mental process/certain method of organizing human activity grouping of abstract ideas, and steps fall within the mathematical concepts grouping of abstract ideas. The limitations are considered together as a single abstract idea for further analysis. (Step 2A, Prong One: YES).

* * *

If the claims are directed toward the judicial exception of an abstract idea, it must then be determined under Step 2A Prong 2 whether the judicial exception is integrated into a practical **[Page 10]** application. Examiner notes that considerations under Step 2A Prong 2 comprise most the consideration previously evaluated in the context of Step 2B. The Examiner submits that the considerations discussed previously determined that the claim does not recite "significantly more" at Step 2B would be evaluated the same under Step 2A Prong 1 and result in the determination that the claim does not integrate the abstract idea into a practical application.

The instant application fails to integrate the judicial exception into a practical application because the instant application merely recites words "apply it" (or an equivalent) with the judicial exception or merely includes instructions to implement an abstract idea. The instant application is directed to a method instructing the reader to implement the identified method of organizing human activity of legal interactions and risk management (i.e., Stading) on generically claimed computer structure. For instance, the additional elements or combination of elements other than the abstract idea itself include the elements such as "NLP accelerator", "generative inference module", "field-programmable gate array", "edge computing", "interactive display interface", "secure network", "graphics processing units", "similarity algorithms", "domain- specific model trained", "memory management unit", "a power management unit", "similarity matching accelerator", or "non-volatile memory" recited at a high level of generality. These elements do not themselves amount to an improvement to the interface or computer, to a technology or another technical field. This is consistent with Applicant's disclosure which barely describes any form of structure. (App. Spec. ¶9).

Accordingly, the claimed "system" read in light of the specification employs any wide range of possible devices comprising a number of

components that are "well-known" and included in an indiscriminate "NLP accelerator", "generative inference module", "field-programmable gate array", "edge computing", "interactive display interface", "secure network", **[Page 11]** "graphics processing units", "similarity algorithms", "domain- specific model trained", "memory management unit", "a power management unit", "similarity matching accelerator", or "non-volatile memory" (e.g., processing device, modules). Thus, the claimed structure amounts to appending generic computer elements to abstract idea comprising the body of the claim. The computing elements are only involved at a general, high level, and do not have the particular role within any of the functions but to be a computer-implemented method using a generically claimed "processor" and "memory" and even basic, generic recitations that imply use of the computer such as storing information via servers would add little if anything to the abstract idea.

Similarly, reciting the abstract idea as software functions used to program a generic computer is not significant or meaningful: generic computers are programmed with software to perform various functions every day. A programmed generic computer is not a particular machine and by itself does not amount to an inventive concept because, as discussed in MPEP 2106.05(a), adding the words "apply it" (or an equivalent) with the judicial exception, or more instructions to implement an abstract idea on a computer, as discussed in *Alice*, 134 S. Ct. at 2360, 110 USPQ2d at 1984 (see MPEP § 2106.05(f)), is not enough to integrate the exception into a practical application. Further, it is not relevant that a human may perform a task differently from a computer. It is necessarily true that a human might apply an abstract idea in a different manner from a computer. What matters is the application, "stating an abstract idea while adding the words 'apply it with a computer'" will not render an abstract idea non-abstract. *Tranxition v. Lenovo*, Nos. 2015-1907, -1941, -1958 (Fed. Cir. Nov. 16, 2016), slip op. at 7-8.

Here, the instructions entirely comprise the abstract idea, leaving little if any aspects of the claim for further consideration under Step 2A Prong 2. In short, the role of the generic computing elements recited in claims 1, 10, 12, and 14, is the same as the role of the computer in **[Page 12]** the claims considered by the Supreme Court in Alice, and the claim as whole amounts merely to an instruction to apply the abstract idea on the generic computerised system. Therefore, the claims have failed to integrate a practical application (2106.04(d)). Under the MPEP 2106.05, this supports the conclusion that the claim is directed to an abstract idea, and the analysis proceeds to Step 2B.

While many considerations in Step 2A need not be reevaluated in Step 2B because the outcome will be the same. Here, on the basis of the additional elements other than the abstract idea, considered individually and in combination as discussed above, the Examiner respectfully submits that the claims 1, 10, 12, and 14, does not contain any additional elements that individually or as an ordered combination amount to an inventive concept and the claims are ineligible.

With respect to the dependent claims do not recite anything that is found to render the abstract idea as being transformed into a patent eligible invention. The dependent claims are merely reciting further embellishments of the abstract idea and do not claim anything that amounts to significantly more than the abstract idea itself.

Claims 10, and 14 are directed to further embellishments of the abstract idea in that they are directed to aspects of the central theme of the abstract idea identified above, as well as being directed to data processing and transmission which the courts have recognized as insignificant extra-solution activities (see at least M.P.E.P. 2106.05(g)). Data transmission is one of the most basic and fundamental uses there are for a generic computing device is not sufficient to amount to significantly more. The examiner takes the position that simply appending the judicial exception with such a well understood step of data transmission is not going to amount to significantly more than the abstract idea.

[Page 13] Therefore, since there are no limitations in the claim that transform the abstract idea into a patent eligible application such that the claim amounts to significantly more than the abstract idea itself, the claims are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. See MPEP 2106.

[Page 38] ***Response to Arguments***[262]

101 Rejections

Applicant's arguments filed with respect to the rejection of claims 101 have been fully considered but they are not persuasive.

* * *

[Page 46] Applicant argues “The Claimed System Is a Technological Solution Tied to Specific Hardware " The claims require specialized hardware modules, including: o NLP accelerator on an ASIC for parsing patent claim language. o GPU/TPU-based similarity matching accelerator for real-time patent-product comparisons. o FPGA-based

[262] The excerpts have been reordered from the original, to group all the 35 U.S.C. § 101 material together.

generative inference module for equivalence testing. o Heatmap visualization chip for 3D patent feature visualization. The claimed invention is not a generic computing system performing an abstract idea but a specialized hardware-accelerated platform designed for a specific technical purpose.” .

Applicant argues that “The system transforms raw patent text and product data into structured, vectorized representations for high-speed similarity matching and real-time infringement analysis. This transformation of unstructured text into structured embeddings that enable hardware-optimized similarity calculations, is a technical process not performable by humans” and “The Claims recite specific hardware components that are not generic”

Additionally, Applicant argues “The Claims Recite Improvements to the Functionality of the System . . . The Hardware Elements Are Not Generic but Provide Technical **[Page 47]** Improvements . . . The Claims Are Directed to a Technological Solution to a Technological Problem . . . differences between Example 47 claim 2 and similarities to Example 47 Claim 3.

Examiner respectfully disagrees that the structure submitted and claimed is improved upon by the claimed invention. The limitations are appending computer elements to the main inventive aspect of infringement analysis in order to generate the result of the analysis.

Examiner notes that the limitations track the Claim 3 of Example 47 in that the limitations amount to an analysis on the information, and outputting a result of the analysis to the user. Applicant alleges a plurality of unsubstantiated improvements to the claimed elements but them admits that the claims amount to data processing (page 16 of arguments) in order to identify patent infringement. Nothing tangible is done with the processing of the information. The result is displayed in a 3D visualization which is another aspect of technology used but not improved on.

Claims can recite a mental process even if they are claimed as being performed on a computer. The Supreme Court recognized this in Benson, determining that a mathematical algorithm for converting binary coded decimal to pure binary within a computer’s shift register was an abstract idea. The Court concluded that the algorithm could be performed purely mentally even though the claimed procedures "can be carried out in existing computers long in use, no new machinery being necessary." 409 U.S at 67, 175 USPQ at 675. See also Mortgage Grader, 811 F.3d at 1324, 117 USPQ2d at 1699 (concluding that concept of

"anonymous loan shopping" recited in a computer system claim is an abstract idea because it could be "performed by humans without a computer").

* * *

[Page 50] Examiner notes that the claimed in invention is similar to the *Voter Verified, Inc., FairWarning, Mortgage Grader, Berkheimer, Content Extraction* and *CyberSource* applications wherein the court identified hardware-integrated system "NLP accelerator", "generative inference module", "field-programmable gate array", "edge computing", "interactive display interface", "secure network", "graphics processing units", "similarity algorithms", "domain- specific model trained", "memory management unit", "a power management unit", "similarity matching accelerator", or "non-volatile memory" is merely serving as a the generic computer, computing environment, or tool to perform the mental process.

The claims stand rejected.

[Page 14] ***Claim Rejections - 35 USC § 103***

* * *

Claim(s) 1, 10, 12, and 14 are rejected under 35 U.S.C. 103 as being unpatentable over U.S. Patent Application Publication No. 20110047166 to Stading et al. (hereinafter Stading) in view of U.S. Patent Application No. 20130282599 to Kang et al. (hereinafter Kang) in view of U.S. Patent Application No. 20090307577 to Lee in view of U.S. Patent Application No. 20180300829 to Crabtree et al. (hereinafter Crabtree) in view of U.S. Patent Application No. 20170322983 to Anderson.

* * *

[Page 20] [I]t would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of determine a similarity between patent information using an algorithm to match the assets (as disclosed by Kang) to the known method and system for analyzing patent information (as disclosed by Stading) to provide patent risk hedging. One of ordinary skill in the art would have been motivated to apply the known technique of determine a similarity between patent information using an algorithm to match the assets because it would provide patent risk hedging (see Kang: Abstract).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of determine a similarity between patent information using an algorithm to match the

assets (as disclosed by Kang) to the known method and system for analyzing patent information (as disclosed by Stading) to determine a similarity between patent information using an algorithm to match the assets, because the claimed invention is merely applying a known technique to a known method ready for improvement to yield predictable results. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

* * *

[Page 23] [I]t would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of determining scenarios related to patent information and statistics (as disclosed by Lee) to the known method and system for analyzing patent information (as disclosed by the combination of Stading and Kang) to analyze the project, through the cost estimator, the expected cost differences and timing differences in order to get a reasonable projection of this strategic shift. One of ordinary skill in the art would have been motivated to **[Page 24]** apply the known technique of determining scenarios related to patent information and statistics because it would analyze the project, through the cost estimator, the expected cost differences and timing differences in order to get a reasonable projection of this strategic shift (see Lee ¶153).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of determining scenarios related to patent information and statistics (as disclosed by Lee) to the known method and system for analyzing patent information (as disclosed by the combination of Stading and Kang) to analyze the project, through the cost estimator, the expected cost differences and timing differences in order to get a reasonable projection of this strategic shift, because the claimed invention is merely applying a known technique to a known method ready for improvement to yield predictable results. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). In other words, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention (i.e., predictable results are obtained by applying the known technique of determining scenarios related to patent information and statistics to the known method and system for analyzing patent information to analyze the project, through the cost estimator, the expected cost differences and

timing differences in order to get a reasonable projection of this strategic shift). *See also* MPEP § 2143(I)(D).

Examiner notes that the claim limitations directed to *implemented on a field-programmable gate array (FPGA)* and *wherein the FPGA is configured for low-latency real-time equivalence analysis of generated scenarios* are further addressed below).

[Page 25] The combination of Stading, Kang, and Lee teach:

an equivalence testing unit configured to analyze whether the hypothetical variations fall within the scope of the patent claims using function-way-result and insubstantial differences tests (see at least Stading: 59 "The learner module 230 applies a current hypothesis (or set of mapping rules and mapping techniques) to predict a probability for each document relative to, for example, each of the international patent classifications and makes an estimate for each patent document as to which class or classes it belongs. The learner module 230 is then provided the correct mappings (i.e., the actual patent classifications for each patent document). The learner module 230 is configured to adjust its hypothesis to reduce errors and to repeat the learning process with another training set. Over a number of learning trials, learner module 230 improves its performance. In an example, learner module 230 is configured to tweak parameters associated with mapping techniques 228 to improve its mapping to a desired performance level.");

* * *

[Page 30] [I]t would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of method and system for conducting a worldwide analysis of the status of intellectual property implemented on a field-programmable gate array (FPGA) and wherein the FPGA is configured for low-latency real-time equivalence analysis (as disclosed by Crabtree) to the known method and system for identifying potential infringement scenarios related to intellectual property using models and equivalency analysis (as disclosed by he combination of Stading, Kang, and Lee) to provide comprehensive and continuous IP landscape visualization, IP risk management, and IP opportunity identification sufficient for making informed business decisions regarding intellectual property in those fields. One of ordinary skill in the art would have been motivated to apply the known technique of method and system for conducting a worldwide analysis of the status of intellectual property implemented on a field-programmable gate array (FPGA) and wherein the FPGA is configured for low-latency real-time equivalence analysis because it would provide comprehensive and continuous IP landscape visualization, IP risk management, and IP

opportunity identification sufficient for making informed business decisions regarding intellectual property in those fields (see Crabtree: Abstract).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of filing to apply the known technique of method and system for conducting a worldwide analysis of the status of intellectual property implemented on a field-programmable gate array (FPGA) and wherein the FPGA is configured for low-latency real-time equivalence analysis (as disclosed by Crabtree) to the known method and system for identifying potential infringement scenarios related to intellectual property using models and equivalency analysis (as disclosed by he combination of Stading, Kang, and Lee) to provide comprehensive and continuous IP landscape **[Page 31]** visualization, IP risk management, and IP opportunity identification sufficient for making informed business decisions regarding intellectual property in those fields, because the claimed invention is merely applying a known technique to a known method ready for improvement to yield predictable results. *See KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 406 (2007).

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/Michael Young/

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