



11-1-2023

## Not So Obvious: Patent Examiners Need Advanced Tools to Support United States Innovation

Steve Zelezny

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# Not So Obvious: Patent Examiners Need Advanced Tools to Support United States Innovation

Steve Zelezny\*

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## I. INTRODUCTION

In 2001, Helsinn Healthcare (Helsinn), a Swiss pharmaceutical company, partnered with Minnesota-based MGI Pharma (MGI) to market and distribute palonosetron—a drug developed to prevent chemotherapy-induced nausea.<sup>1</sup> While a press release announced the partnership, it did not reveal the dosage formulation.<sup>2</sup> Further, as part of the joint agreement, MGI agreed to keep any proprietary information related to the drug confidential.<sup>3</sup> Helsinn applied for and received a provisional patent with the United States Patent and Trademark Office two years after the joint agreement.<sup>4</sup> Helsinn later sued Teva Pharmaceuticals (Teva) for patent infringement after Teva sought Food and Drug Administration (FDA) approval to distribute the same dose of palonosetron.<sup>5</sup> Teva asserted that Helsinn’s patent was invalid.<sup>6</sup> In an unanimous opinion, the nine justices of the United States Supreme Court found for Teva and invalidated Helsinn’s patent—holding that Helsinn’s joint agreement with MGI was “prior art.”<sup>7</sup>

When the Patent and Trademark Office discovers prior art, it means the patent applicant’s claimed invention fails the “novelty” or the “non-obvious” conditions for patentability.<sup>8</sup> Common types of prior art include previous patents, applications, or printed publications describing the same invention.<sup>9</sup> Further, in Helsinn’s case, the Court classified the company’s partnership agreement with MGI as a “public use or sale” of the drug—another category of prior art.<sup>10</sup>

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<sup>1</sup> *Helsinn Healthcare v. Teva Pharms.*, 586 U.S. 1, 3 (2019).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> *See id.* (“Teva countered that the ‘219 patent was invalid under the ‘on sale’ provision of the AIA—which precludes a person from obtaining a patent on an invention that was ‘in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention,’ 35 U.S.C. §102(a)(1)—because the 0.25 mg dose was ‘on sale’ more than one year before Helsinn filed the provisional patent application in 2003.”).

<sup>7</sup> *See id.* (“This Court’s precedent . . . supports the view that a sale or offer of sale need not make an invention available to the public to constitute invalidating prior art.”).

<sup>8</sup> *See 35 U.S.C. 102 Conditions for Patentability; Novelty*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/mpep-9015-appx-l.html> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (under the novelty standard, prior art means “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”); *see also 35 U.S.C. 103 Conditions for Patentability; Non-obvious Subject Matter*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/mpep-9015-appx-l.html> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (under the non-obvious standard, a patent will be denied “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art . . .”).

<sup>9</sup> *35 U.S.C. 102 Conditions for Patentability; Novelty*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/mpep-9015-appx-l.html> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*).

<sup>10</sup> *See Helsinn Healthcare v. Teva Pharms.*, *supra* note 1, at 2 (“A commercial sale to a third party who is required to keep the invention confidential may place the invention ‘on sale’ under §102(a).”); *see also Prior Art Exceptions Under 35 U.S.C. 102(b)(1) to AIA 35 U.S.C. 102(a)(1)*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/s2153.html> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (noting that, under the America Invents Act, “a disclosure which would otherwise qualify as prior art under AIA 35 U.S.C. 102(a)(1) is not prior art if the disclosure was made: (1) One year or less before the effective filing date of the claimed invention . . .”).

Today, patent examiners—who review patent applications and determine whether or not to award a patent—face two main obstacles when searching prior art for a claimed invention.<sup>11</sup> First, recent federal legislation significantly redefined the scope of prior art.<sup>12</sup> When Congress enacted the America Invents Act (AIA) in 2011, the Act removed the geographic requirement for “public use or sale” of an invention in the United States.<sup>13</sup> Under the AIA, a “public use or sale anywhere in the world will act as prior art.”<sup>14</sup> Therefore, due to rapid innovation in countries such as China and Japan, examiners must increasingly refer to foreign uses or sales of inventions to determine patentability.<sup>15</sup> However, examiners do not have wide access to foreign references with the current tools they use to search for prior art.<sup>16</sup>

Second, as of 2019, more than sixty percent of issued utility patents in the United States entail software-related inventions.<sup>17</sup> The explosion of the Internet-of-Things (IoT) industry—integrating home and work devices with internet connectivity—is mainly responsible for this trend.<sup>18</sup> Artificial Intelligence (AI) and machine learning are the backbone of IoT devices.<sup>19</sup> Due to the impact of AI on modern innovations, the Patent and Trademark Office experienced a 100

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<sup>11</sup> *Challenges Faced by USPTO Examiners: An Indication to Outsource Prior Art Search Before Filing*, LEGAL ADVANTAGE (Feb. 4, 2018), <https://www.legaladvantage.net/blog/challenges-faced-uspto-examiners-indication-outsource-prior-art-search-filing/> (on file with the *University of the Pacific Law Review*); U.S. PAT. & TRADEMARK OFF., EXAMINER BROCHURE 2018 (U.S. PAT. & TRADEMARK OFF., 2018).

<sup>12</sup> Nicole Grimm & Emily Miao, *Prior Art Redefined Under the AIA*, JDSUPRA (Nov. 19, 2014), <https://www.jdsupra.com/legalnews/prior-art-redefined-under-the-aia-99842/> (on file with the *University of the Pacific Law Review*).

<sup>13</sup> *See Overview of the Changes to 35 U.S.C. 102 and 103 in the AIA*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/s2151.html> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) (“Under the AIA, a prior public use, sale activity, or other disclosure has no geographic requirement.”).

<sup>14</sup> *See America Invents Act Changes*, FINNEGAN, <https://www.finnegan.com/a/web/116002/finnegan-america-invents-act-changes-brochure.pdf> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (discussing under pre-AIA law, “a public use or sale of a claimed invention will act as prior art [only] if it occurred in the United States”).

<sup>15</sup> *Challenges Faced by USPTO Examiners: An Indication to Outsource Prior Art Search Before Filing*, *supra* note 11.

<sup>16</sup> *See id.* (“The searching tools do not have complete access to foreign references and non-patent literature, which are an essential element of prior art.”).

<sup>17</sup> *See* Raymond Millien, *Six Years After Alice: 61.8% of U.S. Patents Issued in 2019 Were ‘Software-Related’—Up 21.6% from 2018*, IPWATCHDOG (Feb. 17, 2020), <https://www.ipwatchdog.com/2020/02/17/six-years-alice-61-8-u-s-patents-issued-2019-software-related-21-6-2018/id=118986/> (on file with the *University of the Pacific Law Review*) (reflecting the upward trend of “software-related” patents issued in the U.S. from 2018 to 2019); *see also* Will Kenton, *Utility Patent*, INVESTOPEDIA (Mar. 31, 2021), <https://www.investopedia.com/terms/u/utility-patent.asp> (on file with the *University of the Pacific Law Review*) (“A utility patent is a patent that covers the creation of a new or improved—and useful—product, process, or machine.”).

<sup>18</sup> *See* Peter Newman, *The Internet of Things 2020: Here’s What over 400 IoT Decision-Makers Say About the Future of Enterprise Connectivity and How IoT Companies Can Use It to Grow Revenue*, BUS. INSIDER (Mar. 6, 2020), <https://www.businessinsider.com/internet-of-things-report> (on file with the *University of the Pacific Law Review*) (explaining the recent exponential growth of internet-connected devices and projecting there will be more than 41 billion IoT devices by 2027).

<sup>19</sup> *See id.* (“AI and machine learning are critical systems that are continually evolving to provide IoT users with the tools they need to parse mountains of data and quickly discern usable insights.”); *see also* *About Artificial Intelligence*, NAIIO, <https://www.ai.gov/about/> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (“The term ‘artificial intelligence’ means a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments.”).

percent increase in AI-related patent applications since the early 2000s.<sup>20</sup> With the explosion of AI and software-based inventions, however, accessing all relevant prior art for such inventions is an increasingly difficult, if not impossible, task.<sup>21</sup>

With the combination of prior art expansion and the growth of sophisticated technology, the Patent and Trademark Office acknowledges the need for innovation in supporting patent examiners.<sup>22</sup> In particular, the Patent and Trademark Office recently updated some of its legacy systems with AI-based search tools—designed to find relevant documents and offer suggestions for additional searches.<sup>23</sup> With new AI tools on the horizon, the Patent and Trademark Office is committed to building a stronger workforce with the power of advanced technology.<sup>24</sup>

To further accelerate the modernization of the patent examination process, United States Senators Thom Tillis and Patrick Leahy introduced the Patent Examination and Quality Improvement Act in 2022 (PEQIA).<sup>25</sup> If Congress enacts PEQIA, the law will require the United States Comptroller General to submit a report to Congress regarding improvements to the patent examination process.<sup>26</sup> Particularly, the Comptroller General must “rigorously evaluate” existing pilot programs at the Patent and Trademark Office and clearly define “what constitutes a clear and thorough search by a patent examiner.”<sup>27</sup> Using these findings, the Patent and Trademark Office Director must submit a subsequent report to Congress explaining how “the [Patent and Trademark Office] will improve the technical training of patent examiners.”<sup>28</sup>

While PEQIA states the significance of enhancing the examination process, it fails to specify what the Patent and Trademark Office has already

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<sup>20</sup> *Events for the Artificial Intelligence and Emerging Technologies Partnership*, 87 Fed. Reg. 34669, 34670 (June 7, 2022).

<sup>21</sup> *See Challenges Faced by USPTO Examiners: An Indication to Outsource Prior Art Search Before Filing*, LEGAL ADVANTAGE, *supra* note 11 (“The number of patent applications filed every year is enormous as compared to the limited number of patent examiners which is hindering the process of conducting a complete prior art search by the patent examiner.”); *see also* Andrew Schulman, *Open to Inspection: Using Reverse Engineering to Uncover Software Prior Art, Part 2*, SOFTWARE LITIG. CONSULTING, <https://www.softwarelitigationconsulting.com/articles/open-to-inspection-using-reverse-engineering-to-uncover-software-prior-art-part-2/> (last visited Mar. 5, 2022) (on file with the *University of the Pacific Law Review*) (“While descriptions of software are increasingly available in previous patents, patent applications, and the non-patent literature (NPL), software itself is regarded in the patent context as lost prior art inaccessible to searching.”).

<sup>22</sup> Drew Hirshfield, *Artificial Intelligence Tools at the USPTO*, U.S. PAT. & TRADEMARK OFF. (Mar. 18, 2021), <https://www.uspto.gov/blog/director/entry/artificial-intelligence-tools-at-the> (on file with the *University of the Pacific Law Review*).

<sup>23</sup> *See id.*; *see also* Nick Barney, *What Is a Legacy System?*, TECHTARGET, <https://www.techtargget.com/searchitoperations/definition/legacy-application> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (“A legacy system is any outdated computing system, hardware or software that is still in use.”).

<sup>24</sup> *See* Hirshfield, *supra* note 22 (describing the AI tools as “designed to learn from the world’s greatest patent searchers, our USPTO examiners. The system is configured to automatically capture feedback data from our examiners to yield additional enhancements over time.”).

<sup>25</sup> *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25.

<sup>26</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

identified—the prior art search process requires the most reform.<sup>29</sup> Further, PEQIA acknowledges the need to improve examiner training around “complex technologies,” but fails to recognize the most successful training lies in federal-agency partnerships.<sup>30</sup> Therefore, Congress should amend PEQIA to specifically require the Patent and Trademark Office to utilize twenty-first-century technology in prior art searches and coordinate with federal agencies to improve examiner training.<sup>31</sup> Part II explains the evolution of patent law in the United States.<sup>32</sup> Part III evaluates PEQIA’s shortcomings and the need for reform in prior art searches and technical training.<sup>33</sup> Part IV details amendments Congress should adopt to more adequately reflect PEQIA’s goals.<sup>34</sup> Part V concludes that examiners need modernized technical resources in order to maintain the United States’ standing as a global leader in innovation.<sup>35</sup>

## II. EVOLVING PATENT REFORM IN THE UNITED STATES

The Intellectual Property (IP) Clause of the United States Constitution grants Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”<sup>36</sup> The Framers of the Constitution sought to ensure federal law governed patent protection by including the words “Inventors” and “Discoveries” in the IP Clause.<sup>37</sup> The Framers wanted to incentivize the creation of new inventions, thus keeping patents under federal law protected inventors from having to comply with different patent laws in various states.<sup>38</sup> Exercising its authority under the IP Clause, Congress created the Patent and

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<sup>29</sup> *Id.*; see also Hirshfield, *supra* note 22 (“Performing a complete prior art search is a critically important component of the patent examination process and the USPTO’s mission to issue reliable patent rights.”).

<sup>30</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. (2022); see NOAA, *U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, U.S. PAT. & TRADEMARK OFF. (Feb. 28, 2023), <https://www.uspto.gov/about-us/news-updates/noaa-us-patent-and-trademark-office-create-work-sharing-program-advance-green> (on file with the *University of the Pacific Law Review*) (discussing the formal collaboration between the USPTO and NOAA).

<sup>31</sup> See Hirshfield, *supra* note 22 (mentioning that the USPTO is already “incorporating AI tools into two critical areas of patent examination: search and classification”); see also *What Are USPTO-FDA Collaboration Initiatives?*, U.S. PAT. & TRADEMARK OFF. <https://www.uspto.gov/initiatives/fda-collaboration/what-are-uspto-fda-collaboration-initiatives> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) (describing President Biden’s Executive Order on “Promoting Competition in the American Economy”).

<sup>32</sup> *Infra* Part II.

<sup>33</sup> *Infra* Part III.

<sup>34</sup> *Infra* Part IV.

<sup>35</sup> *Infra* Part V.

<sup>36</sup> *Overview of Congress’s Power over Intellectual Property*, CONGRESS.GOV, [https://constitution.congress.gov/browse/essay/artI-S8-C8-1/ALDE\\_00013060](https://constitution.congress.gov/browse/essay/artI-S8-C8-1/ALDE_00013060) (last visited Oct. 30, 2022) (on file with the *University of the Pacific Law Review*).

<sup>37</sup> See *id.* (“The Framers included the IP Clause in the Constitution to facilitate a uniform, national law governing patent and copyrights.”).

<sup>38</sup> See *id.* (“In the Framers’ view, the states could not effectively protect copyrights or patents separately. Under the patchwork state-law system that prevailed in the Articles of Confederation period, creators had to obtain copyrights and patents in multiple states under different standards, a difficult and expensive process that undermined the purpose and effectiveness of the legal regime.”).

Trademark Office—under the United States Department of Commerce (DOC)—as the federal agency tasked with granting patents.<sup>39</sup>

Section A discusses the relationship between “non-obviousness” as a patentability requirement and prior art.<sup>40</sup> Section B outlines the recently enacted National Artificial Intelligence Initiative Act (NAIIA).<sup>41</sup> Section C describes the Biden administration’s efforts to enhance patent examiner training through federal agency coordination.<sup>42</sup> Section D explains the America Invents Act (AIA), the Act’s expansion of prior art, and the subsequent introduction of PEQIA.<sup>43</sup>

#### *A. The Relationship Between Non-Obviousness and Prior Art*

More than 8,000 patent examiners serve as federal employees at the Patent and Trademark Office.<sup>44</sup> Examiners review patent applications and conclude whether or not to award a patent for a new invention.<sup>45</sup> A patent examiner is required to have a background in engineering or science.<sup>46</sup> There are three phases of an examiner’s responsibilities: pre-search, search, and patentability position.<sup>47</sup> During the “pre-search” phase, the examiner reviews the “claim” in the patent application.<sup>48</sup> The claim is the most important aspect of the patent application, as it describes the subject matter of the applicant’s invention.<sup>49</sup> The examiner determines if the claim meets one of the four categories of patent-eligible subject matter: “process, machine, manufacture, or composition of matter.”<sup>50</sup> Next, during the search phase, the examiner conducts a prior art search to determine if the claimed invention is publicly known.<sup>51</sup> Finally, in the patentability position phase, the examiner writes an “office action” describing any issues with the claimed

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<sup>39</sup> *United States Patent and Trademark Office (USPTO)*, LEGAL INFO. INST., [https://www.law.cornell.edu/wex/united\\_states\\_patent\\_and\\_trademark\\_office\\_uspto](https://www.law.cornell.edu/wex/united_states_patent_and_trademark_office_uspto) (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*).

<sup>40</sup> *Infra* Section II.A.

<sup>41</sup> *Infra* Section II.B.

<sup>42</sup> *Infra* Section II.C.

<sup>43</sup> *Infra* Section II.D.

<sup>44</sup> *Attend 2022 Patent Examiner Virtual Recruitment Open House*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/about-us/events/attend-2022-patent-examiner-virtual-recruitment-open-house> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>45</sup> U.S. PAT. & TRADEMARK OFF., EXAMINER BROCHURE 2018 (U.S. PAT. & TRADEMARK OFF., 2018).

<sup>46</sup> *See id.* (noting that basic qualifications include a minimum of a “Bachelor’s degree in engineering or science”).

<sup>47</sup> PATRICK NOLAN & LEONARD CHANG, U.S. PAT. & TRADEMARK OFF., UNDERSTANDING THE PATENT EXAMINATION PROCESS 7 (2020), [https://www.uspto.gov/sites/default/files/documents/InventionCon2020\\_Understanding\\_the\\_Patent\\_Examination\\_Process.pdf](https://www.uspto.gov/sites/default/files/documents/InventionCon2020_Understanding_the_Patent_Examination_Process.pdf) (on file with the *University of the Pacific Law Review*).

<sup>48</sup> *Id.*; *see also* Gene Quinn, *Understanding Patent Claims*, IPWATCHDOG (July 12, 2014), <https://ipwatchdog.com/2014/07/12/understanding-patent-claims/id=50349/> (on file with the *University of the Pacific Law Review*) (noting that the “law requires that the patent applicant particularly point out and distinctly claim the subject matter which the inventor regards as his or her invention”).

<sup>49</sup> Gene Quinn, *Understanding Patent Claims*, IPWATCHDOG (July 12, 2014), <https://ipwatchdog.com/2014/07/12/understanding-patent-claims/id=50349/> (on file with the *University of the Pacific Law Review*).

<sup>50</sup> *See Patent Subject Matter Eligibility*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/ip-policy/patent-policy/patent-subject-matter-eligibility> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) (noting these four categories of patent eligibility are codified in 35 U.S.C. 101).

<sup>51</sup> NOLAN ET AL., *supra* note 47.

invention.<sup>52</sup> At the conclusion of the process, the examiner issues a final notice to the applicant.<sup>53</sup> Subsection 1 explains non-obviousness as a patentability requirement.<sup>54</sup> Subsection 2 illustrates the connection between non-obviousness and prior art.<sup>55</sup>

### 1. The Court Interprets Non-obviousness as a Patentability Requirement

In the mid-19th century, the United States Supreme Court expanded the requirements for patentability.<sup>56</sup> In *Hotchkiss v. Greenwood* (*Hotchkiss*), the Court held that an invention must be not only new and useful, but also non-obvious.<sup>57</sup> The Court found that an examiner should not grant a patent “unless more ingenuity and skill” was necessary than an ordinary person “acquainted with the business” possessed.<sup>58</sup> Under this standard, the Court invalidated a patent for an improvement in making a door knob—the only improvement being a different material to make the knob.<sup>59</sup>

Such a trivial improvement is not patentable, the Court reasoned, because “the improvement is the work of the skillful mechanic, not that of the inventor.”<sup>60</sup> When Congress enacted the Patent Act of 1952, it made non-obviousness a requirement under statutory patent law.<sup>61</sup> Many patent law reformers believed that Congress passed the Act in order to codify the *Hotchkiss* standard.<sup>62</sup> In subsequent cases, the Court reaffirmed the *Hotchkiss* standard for non-obviousness and held that the Act was consistent with that standard.<sup>63</sup>

### 2. The Non-obviousness Test and its Connection to Prior Art

The Patent Act of 1952 was codified in Title 35, Section 103 of the United States Code.<sup>64</sup> Section 103 implicates prior art as a crucial component in the non-obviousness test.<sup>65</sup> The section requires evaluating “the differences between the

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<sup>52</sup> *Id.*

<sup>53</sup> *See id.* (describing that once the examiner examines all issues with the claimed invention, a final “notice of allowance or notice of abandonment” is issued).

<sup>54</sup> *Infra* Subsection II.A.1.

<sup>55</sup> *Infra* Subsection II.A.2.

<sup>56</sup> *Hotchkiss v. Greenwood*, 52 U.S. 248 (1850).

<sup>57</sup> *See id.* at 267 (“[U]nless more ingenuity and skill in applying the old method of fastening the shank and the knob were required...the improvement is the work of a skillful mechanic, not that of the inventor.”).

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

<sup>61</sup> John H. Barton, *Non-Obviousness*, 43 IDEA 475, 485 (2003).

<sup>62</sup> *Id.*

<sup>63</sup> *See id.* (“The Supreme Court interpreted the non-obviousness provision of the new act in 1966 in the leading case of *Graham v. John Deere Co. of Kansas City*. The Court strongly restated the idea that the non-obviousness doctrine rests on constitutional grounds, and also rejected the idea that the 1952 statute changed the legal standard.”).

<sup>64</sup> *See 35 U.S. Code § 103—Conditions for Patentability; Non-Obvious Subject Matter*, CORNELL L. SCH., <https://www.law.cornell.edu/uscode/text/35/103> (last visited Oct. 30, 2022) (on file with the *University of the Pacific Law Review*) (indicating that this code was enacted in 1952).

<sup>65</sup> *Id.*



claimed invention and the prior art,” to conclude that the invention is obvious.<sup>66</sup> In the 1966 case of *Graham v. John Deere (Graham)*, the United States Supreme Court referred to Section 103 while enumerating a new test for non-obviousness.<sup>67</sup>

The Court held that an examiner must follow four steps in evaluating a claimed invention for patent protection.<sup>68</sup> First, the examiner must determine the full “scope and content” of the prior art.<sup>69</sup> Second, the examiner must ascertain the “differences between the prior art and the claims at issue”.<sup>70</sup> Third, the examiner must determine the “level of ordinary skill” in the art.<sup>71</sup> Finally, the examiner may factor in “secondary considerations”, such as “long felt but unsolved needs” or “failure of others” in resolving whether a claimed invention is non-obvious.<sup>72</sup>

### *B. The National Artificial Intelligence Initiative Act Coordinates AI Research and Development Across the Federal Government*

To ensure the United States continued to lead the world in the research and development of AI systems, Congress enacted the National Artificial Intelligence Initiative Act (NAIIA) in 2021.<sup>73</sup> The NAIIA created the National Artificial Intelligence Initiative Office (NAIIO), located under the White House Office of Science and Technology Policy (OSTP).<sup>74</sup> A crucial part of the NAIIO’s role is to promote AI-based technologies to “agency missions and systems across the Federal Government.”<sup>75</sup>

To support the mission behind the NAIIA, the Patent and Trademark Office recently initiated creation of an AI/ET Partnership to enhance the use of AI and emerging technologies (ET) within the agency’s patent examination process.<sup>76</sup> As part of the AI/ET Partnership, the Patent and Trademark Office will convene “academia, independent inventors, small businesses, industry, other government agencies, nonprofits, and civil society.”<sup>77</sup> The Patent and Trademark Office has held meetings to articulate its plans for incorporating AI-related initiatives into the examination process, as well as to gather insight from the public.<sup>78</sup>

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<sup>66</sup> *Id.*

<sup>67</sup> *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Id.*; see also *KSR International Co. v. Telefax Inc.*, 550 U.S. 398, 399 (2007) (reaffirming the *Graham* test and further holding that the Court of Appeals for the Federal Circuit, in finding that a “patent claim is only proved obvious if ‘some motivation or suggestion to combine the prior art teachings’ can be found in the prior art”, improperly “analyzed the issue in a narrow, rigid manner inconsistent with §103 and our precedents”).

<sup>73</sup> *About Artificial Intelligence*, NAIIO, <https://www.ai.gov/about/> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*).

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *Events for the Artificial Intelligence and Emerging Technologies Partnership*, *supra* note 20.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

*C. President Joe Biden's Executive Order to Enhance Examiner Training Through Federal Agency Coordination*

In July 2021, President Joe Biden issued an Executive Order (EO) to prevent the patenting of obvious changes to drugs already on the market.<sup>79</sup> Patenting such changes prevented generic medicines from entering the market and lowering the costs for American families.<sup>80</sup> In the EO, President Biden directed the Patent and Trademark Office and the FDA to find an appropriate balance between incentivizing drug development and encouraging competition.<sup>81</sup> While recognizing pharmaceutical companies should be able to recoup their investments, the Biden administration stated the patent system should not be exploited “beyond that reasonably contemplated by law.”<sup>82</sup>

As part of the partnership, the FDA committed to providing technical training in pharmaceuticals to patent examiners.<sup>83</sup> Further, the Patent and Trademark Office also pledged to provide new tools for examiners to search technical FDA sources for prior art.<sup>84</sup> The Biden Administration viewed this initiative as an important step towards allowing generic drugs to enter the market, while also safeguarding the incentives behind the IP Clause.<sup>85</sup>

*D. The America Invents Act's Expansion of Prior Art Creates Challenges for Examiners—Leading to PEQIA*

In 2011, President Barack Obama signed the America Invents Act (AIA) into law.<sup>86</sup> The AIA is the most significant piece of legislation impacting United States patent law since the Patent Act of 1952.<sup>87</sup> Passed with bipartisan support, the AIA sought to adapt United States patent law to modern technological advances and to evolving international trends.<sup>88</sup>

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<sup>79</sup> Kathi Vidal, *The Biden Administration is Acting to Promote Competition and Lower Drug Prices for All Americans*, U.S. PAT. & TRADEMARK OFF. (July 6, 2022), <https://www.uspto.gov/blog/director/entry/the-biden-administration-is-acting> (on file with the *University of the Pacific Law Review*).

<sup>80</sup> *See id.* (“[W]hile the issuance of robust and reliable patents to incentivize pharmaceutical innovations is critical, our patent system must not be used to unjustifiably delay generic drugs and biosimilar competition beyond that reasonably contemplated by law.”).

<sup>81</sup> *Id.*

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> *Id.*

<sup>85</sup> *Id.*

<sup>86</sup> *President Obama Signs America Invents Act, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs*, WHITE HOUSE (Sept. 16, 2021), <https://obamawhitehouse.archives.gov/the-press-office/2011/09/16/president-obama-signs-america-invents-act-overhauling-patent-system-stim> (on file with the *University of the Pacific Law Review*).

<sup>87</sup> *America Invents Act, Ten Years After Enactment*, NEXSEN PRUET (Sept. 10, 2021), <https://www.nexsenpruet.com/publication-america-invents-act-ten-years-after-enactment> (on file with the *University of the Pacific Law Review*).

<sup>88</sup> *See id.* (“Changes in the US patent law were not only needed because of advances in technology since 1952, but also because the international landscape for patents had changed.”).

One of the AIA's most significant impacts on examiners was that it expanded the scope of prior art.<sup>89</sup> For instance, the AIA removed the geographic boundary for public use or sale of an invention.<sup>90</sup> Now, a "prior public use, sale activity, or other disclosure" does not have to occur in the United States to be considered prior art.<sup>91</sup>

While the AIA expanded the scope of prior art, it also created a "fast track" option for startup companies.<sup>92</sup> With this option, AIA guaranteed that startup companies could have their patent applications reviewed within twelve months, which is one-third of the average turnaround time.<sup>93</sup> The Obama administration viewed a faster, more efficient patent examination process as essential to the United States' "competitiveness in the global economy."<sup>94</sup> However, this accelerated examination process—coupled with the significant expansion of prior art—led to more examiners issuing patents that should have been denied.<sup>95</sup>

In 2022, Senators Thom Tillis and Patrick Leahy proposed PEQIA in response to concerns about AIA's impact on patent quality.<sup>96</sup> They argued that examiners did not have the time necessary to issue quality patents, given AIA's expansion of prior art and the complexity of technologies.<sup>97</sup> PEQIA has three core requirements.<sup>98</sup> First, the bill requires the Comptroller General to submit to Congress a report describing recommendations for improving the patent examination process.<sup>99</sup> Second, PEQIA compels the Patent and Trademark Office Director to develop new patent examination processes based on the Comptroller

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<sup>89</sup> *America Invents Act (AIA): What CWRU Inventors Need to Know*, CASE W. RSRV. UNIV., <https://case.edu/research/sites/case.edu.research/files/2018-04/AIASum.pdf> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>90</sup> *Id.*; *Overview of the Changes to 35 U.S.C. 102 and 103 in the AIA*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/s2151.html> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>91</sup> *Overview of the Changes to 35 U.S.C. 102 and 103 in the AIA*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/mpep/s2151.html> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>92</sup> *President Obama Signs America Invents Act, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs*, *supra* note 86.

<sup>93</sup> *Id.*

<sup>94</sup> *Id.*

<sup>95</sup> See Josh Landau, *Granted in 19 Hours*, PATENTPROGRESS (Mar. 6, 2018), <https://www.patentprogress.org/2018/03/granted-19-hours/> (on file with the *University of the Pacific Law Review*) (noting a study showing "decreased examination time associated with increased seniority corresponded to significant increases in grant rate"); see also Tillis and Leahy *Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25 ("This bill follows up on our hearing last year on patent quality, which put a spotlight on the fact that many U.S. patents represent brilliant inventions and drive our economy. Unfortunately though, some are issued by mistake and can cause great expense for unsuspecting Americans and small businesses.").

<sup>96</sup> *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25.

<sup>97</sup> See *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, SENATOR THOM TILLIS (Aug. 2, 2022), *supra* note 25 ("This complexity can and does lead to the necessity for patent examiners to raise more complex prior art rejections.").

<sup>98</sup> *Id.*

<sup>99</sup> *Id.*; see also *U.S. Comptroller General*, U.S. GOV'T ACCOUNTABILITY OFF., <https://www.gao.gov/about/comptroller-general> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) ("The Comptroller General of the United States heads the Government Accountability Office (GAO), an agency within the legislative branch of the federal government.").

General's recommendations.<sup>100</sup> Finally, the bill commands the Patent and Trademark Office Director to submit to Congress a roadmap for how to improve examiner technical training in the area of emerging technologies.<sup>101</sup>

### III. CONGRESS MUST SUPPORT PATENT EXAMINERS WITH ADVANCED TECHNOLOGY AND TRAINING

Senator Tillis argued that PEQIA would restore confidence in the United States IP system by ensuring all issued patents are “high quality” and undergo a thorough examination.<sup>102</sup> To accomplish these goals, Senator Tillis also asserted that there is no “silver bullet”, meaning PEQIA must evaluate many phases of the patent examination process.<sup>103</sup> To make that evaluation, PEQIA requires the Patent and Trademark Office Director to issue guidance on how the agency will improve overall patent quality.<sup>104</sup> Further, PEQIA requires the Patent and Trademark Office Director to submit a report to Congress detailing how the agency will enhance technical training for its examiners.<sup>105</sup> However, PEQIA risks being ineffective legislation due to its lack of specificity.<sup>106</sup> Section A explains how enhancing prior art searches with AI-driven tools is the most crucial need for the Patent and Trademark Office.<sup>107</sup> Section B stresses the importance of federal-agency coordination to enhance examiner technical training.<sup>108</sup>

#### *A. The Patent Examination Process's Most-Needed Reform is Boosting Prior Art Searching with AI Tools*

AI will be at the center of the acceleration in the Internet-of-Things market, which is expected to grow to over \$2.4 trillion by 2027.<sup>109</sup> Further, the multidisciplinary impact of Internet-of-Things-driven tools means the global IP landscape will grow in complexity.<sup>110</sup> For instance, the development of wearable medical devices, such as Fitbits, requires expertise in three fields: advanced

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<sup>100</sup> Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality, *supra* note 25.

<sup>101</sup> *Id.*

<sup>102</sup> Gene Quinn, Tillis Addresses Criticism of His Eligibility Reform Bill, Warns WD of TX Not to Backtrack on Standing Order, IPWATCHDOG (Aug. 31, 2022), <https://ipwatchdog.com/2022/08/31/tillis-addresses-criticism-eligibility-reform-bill-warns-wd-tx-not-backtrack-standing-order/id=151211/> (on file with the *University of the Pacific Law Review*).

<sup>103</sup> *Id.*

<sup>104</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>105</sup> *Id.*

<sup>106</sup> *See id.* (noting that PEQIA makes no mention of “prior art” in its discussion of “improving the process”).

<sup>107</sup> *Infra* Section III.A.

<sup>108</sup> *Infra* Section III.B.

<sup>109</sup> *See supra* note 18 (“AI and machine learning are critical systems that are continually evolving to provide IoT users with the tools they need to parse mountains of data and quickly discern usable insights.”).

<sup>110</sup> *See* Luke Tregilgas, *Multidisciplinary Approaches—the Rise of Multidisciplinary Inventions*, MURGITROYD (May 6, 2021), <https://www.murgitroyd.com/en-us/blog/multidisciplinary-approaches/> (on file with the *University of the Pacific Law Review*) (“The term ‘multidisciplinary invention’ in the context of this discussion refers to an invention requiring a technical understanding of two or more of the classical patent disciplines: life sciences (biology, biochemistry and pharmaceuticals); chemistry; digital technologies, physics and electronics; and mechanical engineering.”).

computing; biology; and mechanical engineering.<sup>111</sup> When considering the patentability of such devices, examiners must evaluate the prior art within each of these fields.<sup>112</sup> Considering that examiners have, on average, just over twenty-two hours to fully examine an application, the explosion of multidisciplinary inventions adds a burdensome element to the process.<sup>113</sup> Within the 22-hour timeframe, examiners must search a growing prior art database of hundreds of millions prior art documents.<sup>114</sup> Searching through this database is itself a logistical challenge, especially considering that the Patent and Trademark Office received over 600,000 patent applications in 2022 alone.<sup>115</sup> Further, Senator Tillis acknowledged that, due to the acceleration of complex technologies in patent applications, “the proliferation of prior art” has rapidly increased.<sup>116</sup> Now, with multidisciplinary inventions not confined to one specific field, examiners must also refer to prior art references within several disciplines.<sup>117</sup> Since AI is the foundation of many multidisciplinary innovations, the Patent and Trademark Office must counteract with AI-driven tools that simplify the prior art searching process.<sup>118</sup> Subsection 1 details how the Patent and Trademark Office is already implementing AI-driven tools to streamline prior art searches.<sup>119</sup> Subsection 2 reinforces that the Patent and Trademark Office should consider adopting foreign patent offices’ innovative AI-based practices.<sup>120</sup>

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<sup>111</sup> *Id.*; see also *Latest Trends in Medical Monitoring Devices and Wearable Health Technology (2023)*, INSIDERINTEL. (Jan. 13, 2023), <https://www.insiderintelligence.com/insights/wearable-technology-healthcare-medical-devices/> (on file with the *University of the Pacific Law Review*) (“Wearable technology is any type of electronic device designed to be worn on a user’s body, including Fitbits and smartwatches. Wearable devices in healthcare are designed to collect the data of users’ personal health and exercise, and can even send a patient’s health information to a doctor or other healthcare professional in real-time.”).

<sup>112</sup> See Tregilgas, *supra* note 110 (noting that “a patent professional is invariably required to combine the unique patentability considerations for each respective discipline”).

<sup>113</sup> *Statement of Commissioner for Patents Andrew Hirshfeld Before the United States Senate Subcommittee on Intellectual Property Committee on the Judiciary*, U.S. PAT. & TRADEMARK OFF. (Oct. 30, 2019), <https://www.uspto.gov/about-us/news-updates/statement-commissioner-patents-andrew-hirshfeld-united-states-senate> (on file with the *University of the Pacific Law Review*).

<sup>114</sup> *Id.*

<sup>115</sup> Kirk Hartung, *2022 U.S. Patent Filings Statistics*, LEXOLOGY <https://www.lexology.com/library/detail.aspx?g=1170d66d-63b8-4901-b819-e88c67916a2f> (last visited Apr. 23, 2023) (on file with the *University of the Pacific Law Review*).

<sup>116</sup> *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25.

<sup>117</sup> See Tregilgas, *supra* note 110 (“It is therefore important for patent professionals handling patent applications to inventions which overlap more than one of these disciplines to stay abreast of the unique considerations applied to each respective discipline.”).

<sup>118</sup> See Hirshfeld, *supra* note 22 (“We are incorporating AI tools into two critical areas of patent examination: search and classification.”).

<sup>119</sup> *Infra* Subsection III.A.1.

<sup>120</sup> *Infra* Subsection III.A.2.

1. *The Patent and Trademark Office's Current Efforts to Implement AI-centered Tools*

To conduct a thorough search for prior art, examiners currently use the Patents End-to-End (PE2E) Search tool.<sup>121</sup> A web-based platform, PE2E Search is a sizable improvement from previous legacy tools in that its expanded functionality enables access to millions of foreign patent documents.<sup>122</sup> Additionally, these foreign patent references are translated in English, allowing examiners to comprehend a wider range of important documents relating to the patentability of a claimed invention.<sup>123</sup>

Recently, the Patent and Trademark Office has demonstrated its commitment to further improving PE2E Search's performance by integrating AI-based search tools.<sup>124</sup> For instance, the Patent and Trademark Office recently deployed an AI-based "More Like This" feature that enables examiners to retrieve more relevant patent documents not included in their original search.<sup>125</sup> Once an examiner chooses an "anchor document", the algorithm generates a broad list of domestic or foreign patent references most similar to the anchor document.<sup>126</sup> The "More Like This" tool is just one of several AI-based features the Patent and Trademark Office is testing with examiners.<sup>127</sup>

The Patent and Trademark Office's wide adoption of AI-driven prototypes, such as the "More Like This" tool, will lead to the discovery of more relevant prior art earlier in the process.<sup>128</sup> For example, in searching prior art related to software-based patent applications, examiners have been limited to previous patent documents.<sup>129</sup> However, new AI search tools may provide examiners with suggestions for additional prior art references—outside of patent documents—in existing software applications.<sup>130</sup> Thus, the Patent and Trademark Office's deployment of AI-based search tools may dramatically improve the patent

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<sup>121</sup> Drew Hirshfeld, *New PE2E Search Tool Using AI Search Features*, U.S. PAT. & TRADEMARK OFF. (Dec. 20, 2021), <https://www.uspto.gov/sites/default/files/documents/og-aiforpe2e-20211220.pdf> (on file with the *University of the Pacific Law Review*) ("PE2E Search is a modern, web-based platform with a focus on performance and adaptability. This tool provides features similar to legacy USPTO patent search tools, but allows for additional search functionalities.").

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> Hirshfeld, *supra* note 22; Hirshfeld, *supra* note 121.

<sup>125</sup> Hirshfeld, *supra* note 121.

<sup>126</sup> *Id.*

<sup>127</sup> *See id.* ("For example, AI features that generate suggestions for prior art references, refine document sorting, add insight into AI reasoning, and provide additional Cooperative Patent Classification suggestions are currently being tested in a beta version by a small subset of examiners.").

<sup>128</sup> Christina Sperry, *The USPTO's Patent Classification and Search Systems Have Jumped on the AI Bandwagon*, MINTZ, <https://www.mintz.com/insights-center/viewpoints/2231/2021-07-08-usptos-patent-classification-and-search-systems-have> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>129</sup> *See* Akshay Vashishtha, *Applying First Principle Thinking for Invalidating a Software Patent*, GREYB, <https://www.greyb.com/blog/invalidating-a-software-based-patent/> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) ("Prior art may also exist in previously built software applications, but it is difficult and time-consuming to test all such applications and get into their codebase . . . Therefore, when dealing with software patents, patent examiners do not have time to examine the claims against the full scope of the prior art.").

<sup>130</sup> Hirshfeld, *supra* note 121.

examination process in innovative fields such as software, saving applicants time and money.<sup>131</sup>

The Patent and Trademark Office has also expedited the examination process by enabling applicants' involvement in the initial search process.<sup>132</sup> The Patent and Trademark Office's recent launch of the online Patent Public Search (PPUBS) tool enables applicants to remotely search all published patents and applications in the United States.<sup>133</sup> Committed to replacing cumbersome legacy systems, the Patent and Trademark Office developed PPUBS based on the internal PE2E Search tool.<sup>134</sup> Thus, PPUBS includes many of the beneficial features of PE2E Search.<sup>135</sup> PPUBS is a success: thousands of users are using PPUBS every day to search for existing patents—before submitting an application.<sup>136</sup> Using advanced tools to gain broader access to prior art, applicants can submit higher-quality applications and further reduce examiners' workload.<sup>137</sup>

## 2. *The Patent and Trademark Office Can Learn From, and Adopt, Innovative Practices in Foreign Patent Offices*

While the Patent and Trademark Office is proactively integrating advanced technology and AI into the prior art searching process, it should consider adopting practices from foreign patent offices.<sup>138</sup> For instance, the European Patent Office (EPO) created a Data Science team to coordinate with all of the agency's departments in applying AI to prior-art searching.<sup>139</sup> The Data Science team is composed of six data scientists, as well as patent examiners with the requisite technical knowledge.<sup>140</sup> The team conducts a range of training sessions—from beginner-level to expert-level training in AI and machine learning.<sup>141</sup> The team also puts this training into practice, such as hosting a coding competition in which EPO employees solve patent-related problems with AI.<sup>142</sup>

The Patent and Trademark Office can learn from the EPO's innovative practices to increase AI-based acumen across all departments, especially those

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<sup>131</sup> See Sperry, *supra* note 128 (noting the AI technology that USPTO is implementing will make it “more time and cost-effective for applicants” because the system will capture relevant prior art “at the start of prosecution and not after multiple office actions”).

<sup>132</sup> Andrew Faile, *Patent Public Search Tool—A Streamlined Way to Search all U.S. Published Patent Applications*, U.S. PAT. & TRADEMARK OFF. (Aug. 10, 2022), <https://www.uspto.gov/blog/director/search?q=Prior+Art> (on file with the *University of the Pacific Law Review*).

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> See *id.* (“Some similar features include highlighting, efficient tagging, and advanced notes for searching, analyzing, and managing patent data.”).

<sup>136</sup> *Id.*

<sup>137</sup> See *id.* (referencing a customer testimonial saying the PPUBS tool “saves a lot of time while improving the search results I am able to obtain . . .”).

<sup>138</sup> *Artificial Intelligence*, EURO. PAT. OFF. (Feb. 5, 2022), <https://www.epo.org/news-events/in-focus/ict/artificial-intelligence.html> (on file with the *University of the Pacific Law Review*).

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> *Id.*

<sup>142</sup> *Id.*

centered on technology.<sup>143</sup> While the Patent and Trademark Office employs nine Technology Centers, each providing examinations for different technologies, it lacks a universal team to coordinate AI-based practices across each center.<sup>144</sup> Given that many innovations today implicate multiple disciplines, the Patent and Trademark Office should adopt the EPO's approach and create a cross-functional team to coordinate AI-based training across Technology Centers.<sup>145</sup>

### *B. Enhancing Examiner Technical Training Must Require Federal Agency Coordination*

Even with the need for an internal, cross-functional team to coordinate AI-related training, the Patent and Trademark Office is committed to building partnerships to enhance examiners' technical knowledge.<sup>146</sup> This commitment dates back to 2014, when the Obama administration announced an executive action to expand the "Patent Examiner Technical Training Program" (PETTP).<sup>147</sup> In particular, the PETTP called on outside volunteers—experts in specific fields and technologies—to provide "relevant, technical training and expertise to patent examiners."<sup>148</sup> Following PETTP requirements, volunteer speakers need to have the requisite technical knowledge and familiarity with the relevant prior art in that area of technology.<sup>149</sup> However, while examiners derive substantial value from the PETTP, the program's scale is limited in that it is voluntary.<sup>150</sup> Other than the

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<sup>143</sup> See *id.* (noting the focus of EPO's Data Science team in "applying artificial intelligence and machine learning technologies to increase efficiency and quality in the patent grant process"); see also *Patent Technology Centers Management*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/contact-patents/patent-technology-centers-management> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) (listing nine Technology Centers but no Data Science team to coordinate AI-based training).

<sup>144</sup> *Patent Technology Centers Management*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/contact-patents/patent-technology-centers-management> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>145</sup> See *Events for the Artificial Intelligence and Emerging Technologies Partnership*, *supra* note 20 ("The report found that AI is increasingly important for invention, and it diffuses broadly across technologies, inventor-patentees, organizations, and geography."); see also UNITED STATES PATENT AND TRADEMARK OFFICE 2022-2026 STRATEGIC PLAN 15 (U.S. PAT. & TRADEMARK OFF., 2022 ("Strategy 6: Enhance collaboration between art units to address applications where technologies converge.")).

<sup>146</sup> *About Patent Examiner Technical Training Program (PETTP)*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/initiatives/patent-examiner-technical-training-program/about-patent-examiner-technical> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>147</sup> *Id.*

<sup>148</sup> See *USPTO-led Executive Actions on High tech Patent Issues*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/patents/initiatives/uspto-led-executive-actions-high-tech-patent-issues#heading-7> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*) (noting the urgency of enhancing examiner training by simplifying the process of a scientist or engineer to volunteer their time).

<sup>149</sup> *About Patent Examiner Technical Training Program (PETTP)*, U.S. PAT. & TRADEMARK OFF., *supra* note 146.

<sup>150</sup> See Yuri Eliezer, *3 Key Takeaways from the USPTO Patent Examiner Training*, FOUNDERSLEGAL (June 1, 2021), <https://founderslegal.com/3-key-takeaways-from-the-uspto-patent-examiner-training/> (on file with the *University of the Pacific Law Review*) (describing examiners were engaged during the trainings and are able to learn about emerging technologies, but that speakers still had to be invited to come speak).



opportunity to train examiners in various technologies, private sector scientists and engineers have no incentive to participate in PETTP.<sup>151</sup>

Due to the minimal reach of PETTP, federal agencies should step in to provide advanced technical training to examiners.<sup>152</sup> Under the executive branch of government, federal agencies do not respond to private incentives—their purpose is to enforce the law.<sup>153</sup> In enforcing current patent laws, federal agency representatives can teach examiners how to access the agency’s most relevant, publicly available information when conducting prior art searches.<sup>154</sup> The Patent and Trademark Office can also translate federal agency-guided technical trainings into further improvement of its AI search tools.<sup>155</sup>

For instance, in its partnership with the FDA, the Patent and Trademark Office is enabling examiners to know where to access more relevant prior art in the pharmaceutical industry.<sup>156</sup> However, the Patent and Trademark Office is also building new tools for examiners to search the growing amount of technical information in the pharmaceutical field—including FDA-maintained information.<sup>157</sup> Thus, federal agency-directed training will not only improve examiners’ knowledge, but also the accuracy of AI-based tools which examiners need to conduct a thorough prior art search.<sup>158</sup>

In response to President Biden’s latest Executive Order regarding the FDA, the Patent and Trademark Office outlined several initiatives, including “enhancing collaboration with other agencies...on key technology areas.”<sup>159</sup> To accelerate this collaboration, the Patent and Trademark Office can request the Biden administration issue more EOs regarding other agencies.<sup>160</sup> The Patent and Trademark Office can point to President Obama’s executive actions in 2013—announcing five key areas to strengthen the “quality and accessibility of the patent system.”<sup>161</sup> While one of these executive actions called on the Patent and

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<sup>151</sup> See *About Patent Examiner Technical Training Program (PETTP)*, *supra* note 146 (“PETTP is not intended as an opportunity for applicants to discuss pending applications with USPTO employees or to circumvent normal communication between applicants or applicants’ representatives and USPTO employees. In addition, PETTP participants are not to provide advice or recommendations to the USPTO.”).

<sup>152</sup> See Vidal, *supra* note 79 (noting the success of President Biden’s Executive Order in “outlining numerous initiatives” to “strengthen our relationship and expand the resources available for assessing patentability and addressing instances of patents being used improperly to delay competition”).

<sup>153</sup> *Federal Agencies and Executive Branch*, ARIZ. STATE UNIV. COLL. L., <https://libguides.law.asu.edu/federalagenciesandexecutivebranch/administrativeagencies> (last visited Apr. 23, 2023) (on file with the *University of the Pacific Law Review*).

<sup>154</sup> UNITED STATES PATENT AND TRADEMARK OFFICE 2022–2026 STRATEGIC PLAN 15 (U.S. PAT. & TRADEMARK OFF., 2022) (“The USPTO will also provide new tools for patent examiner to use to search enormous and growing global databases of technical information, including publicly available sources maintained by the FDA, to determine whether similar innovations already exist.”).

<sup>155</sup> *Id.*

<sup>156</sup> *Id.*

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*

<sup>159</sup> *What Are USPTO-FDA Collaboration Initiatives?*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/initiatives/fda-collaboration/what-are-uspto-fda-collaboration-initiatives> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>160</sup> See Vidal, *supra* note 79 (showing the Biden Administration already issued an Executive Order to enhance collaboration between the USPTO and FDA).

<sup>161</sup> *USPTO-led Executive Actions on High tech Patent Issues*, *supra* note 148.

Trademark Office to enhance examiner training, it did not require federal agencies to support those training efforts.<sup>162</sup> Therefore, the Biden administration can add a sixth executive action—directing federal agencies to build initiatives with the Patent and Trademark Office to enhance technical training for examiners.<sup>163</sup>

Absent the Biden administration taking further executive action, the Patent and Trademark Office can build on its collaboration with the FDA by calling on other federal agencies to create similar partnerships.<sup>164</sup> In fact, with a specific eye towards AI and Emerging Technologies (ET), the Patent and Trademark Office is proactively reaching out to government agencies through the new AI/ET Partnership.<sup>165</sup> In response to the National Artificial Intelligence Initiative Act (NAIIA), the AI/ET Partnership brings together key stakeholders, including government agencies, to support the Patent and Trademark Office’s AI/ET efforts.<sup>166</sup> While the AI/ET Partnership is similar to the PETTP in its voluntary nature, it is already proving impactful, as it has held ten meetings since 2022.<sup>167</sup>

Because of the AI/ET Partnership, the Patent and Trademark Office and the National Oceanic and Atmospheric Administration (NOAA) partnered to incentivize innovation in climate-friendly “green” technologies.<sup>168</sup> Like the Patent and Trademark Office, the NOAA is also an agency under the United States Department of Commerce (DOC).<sup>169</sup> Under the partnership, NOAA experts will train examiners “reviewing patent applications related to climate and environmental technologies.”<sup>170</sup> In exchange, the Patent and Trademark Office will

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<sup>162</sup> See *Fact Sheet: White House Task Force on High-Tech Patent Issues*, WHITE HOUSE (June 4, 2013), <https://obamawhitehouse.archives.gov/the-press-office/2013/06/04/fact-sheet-white-house-task-force-high-tech-patent-issues> (on file with the *University of the Pacific Law Review*) (“The PTO will provide new targeted training to its examiners on scrutiny of functional claims and will, over the next six months develop strategies to improve claim clarity, such as by use of glossaries in patent specifications to assist examiners in the software field.”).

<sup>163</sup> *USPTO-led Executive Actions on High tech Patent Issues*, *supra* note 148.

<sup>164</sup> See *AI and Emerging Technology Partnership Engagement and Events*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/initiatives/artificial-intelligence/ai-and-emerging-technology-partnership-engagement-and-events> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (“The AI/ET Partnership is an ongoing cooperative effort between the USPTO and the AI/ET community, including academia, independent inventors, small businesses, industry, other government agencies, nonprofits, and civil society.”).

<sup>165</sup> *Id.*

<sup>166</sup> *Events for the Artificial Intelligence and Emerging Technologies Partnership*, *supra* note 20.

<sup>167</sup> See *AI and Emerging Technology Partnership Engagement and Events*, *supra* note 164 (“Participants from across the AI/ET community, as well as anyone with an interest in AI/ET, are encouraged to participate in these recurring meetings and provide feedback.”); *NOAA, U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, U.S. PAT. & TRADEMARK OFF. (Feb. 28, 2023), <https://www.uspto.gov/about-us/news-updates/noaa-us-patent-and-trademark-office-create-work-sharing-program-advance-green> (on file with the *University of the Pacific Law Review*) (noting an example of the USPTO successfully collaborating with another federal agency).

<sup>168</sup> *NOAA, U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, U.S. PAT. & TRADEMARK OFF. (Feb. 28, 2023), <https://www.uspto.gov/about-us/news-updates/noaa-us-patent-and-trademark-office-create-work-sharing-program-advance-green> (on file with the *University of the Pacific Law Review*).

<sup>169</sup> *Bureaus and Offices*, U.S. DEP’T. COM., <https://www.commerce.gov/bureaus-and-offices> (last visited Apr. 23, 2023) (on file with the *University of the Pacific Law Review*).

<sup>170</sup> *NOAA, U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168.

offer IP training to NOAA’s scientists and researchers.<sup>171</sup> The partnership is mutually beneficial: examiners need to grow their technical knowledge in specialized fields, while research-oriented agencies need to know how to protect their IP rights.<sup>172</sup> Thus, Patent and Trademark Office’s partnership with NOAA—requiring extensive strategy sessions to formalize—further demonstrates that inter-agency coordination will be a necessity as technologies grow in complexity.<sup>173</sup>

#### IV. CONGRESS SHOULD AMEND PEQIA TO PROVIDE CONCRETE GUIDANCE TO THE PATENT AND TRADEMARK OFFICE

PEQIA’s objective is to enhance the quality of patents in the United States.<sup>174</sup> However, the bill lacks a tailored focus to meet this objective.<sup>175</sup> For example, the bill validly delegates the authority to proscribe processes for improving patent quality to the Patent and Trademark Office.<sup>176</sup> However, PEQIA is overly broad and fails to account for what the Patent and Trademark Office already believes is the best avenue for enhancing the patent examination process.<sup>177</sup> Section A proposes that PEQIA should be amended to direct the Patent and Trademark Office Director to provide guidance for how AI technologies will enhance prior art searches.<sup>178</sup> Section B comments that PEQIA should direct the Patent and Trademark Office Director to solidify a roadmap for how it will coordinate with federal agencies to enhance technical training for examiners.<sup>179</sup>

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<sup>171</sup> *Id.*

<sup>172</sup> *See id.* (explaining that the goal of the program is to “enhance cooperation among the agencies and strengthen their respective work to incentivize greater innovation in” IP and environmental technology); *AI and Emerging Technology Partnership Engagement and Events*, *supra* note 164 (describing that the program will engage “the AI/ET community on ongoing and future USPTO AI/EI efforts” while also allowing the USPTO to understand intellectual property issues in the AI/ET community).

<sup>173</sup> *See NOAA, U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168 (“The program, featuring the exchange of employees over the course of up to a year, will enhance cooperation among the agencies and strengthen their respective work to incentive greater innovation these critical areas.”).

<sup>174</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>175</sup> *Id.*

<sup>176</sup> *Id.*

<sup>177</sup> *Id.*; *see also* Hirshfield, *supra* note 22 (“[T]he exponential growth of prior art and tremendous pace of technological innovation make it increasingly more difficult to quickly discover the most relevant prior art. To meet this challenge, we have developed an AI-based prototype search system that helps to identify relevant documents and provides suggestions for additional areas to search.”).

<sup>178</sup> *Infra* Section IV.A.

<sup>179</sup> *Infra* Section IV.B.

*A. Amending PEQIA to Focus on Enhancing Prior Art Searches With Advanced Technology*

Discovering prior art is one of the most common reasons an examiner will reject a patent application.<sup>180</sup> However, when examiners do not have the advanced tools, and sufficient time, required to thoroughly search for prior art, it leads to improperly issued patents.<sup>181</sup> In software-based patent applications, for example, searching for existing software patents is often inadequate because software code evolves so quickly.<sup>182</sup> Thus, with new and disruptive technologies such as AI, examiners do not find a lot of relevant prior art in existing patents, leading to invalid patents.<sup>183</sup> Further, as *Helsinn* demonstrated, improperly issued patents often result in expensive litigation and extensive financial losses for all parties.<sup>184</sup>

The Patent and Trademark Office is already demonstrating its commitment to implementing AI search tools that go beyond existing patents and applications—particularly relevant for software inventions.<sup>185</sup> Currently, the Patent and Trademark Office is working to match the “tremendous pace of technological innovation” by “integrating AI into the Patent and Trademark Office’s day-to-day functions.”<sup>186</sup> Meanwhile, PEQIA’s language remains broad in merely requiring the Patent and Trademark Office Director to improve the patent examination process” by “defining what constitutes a clear and thorough search. . . .”<sup>187</sup> Therefore, PEQIA’s authors must narrow the bill to meet the urgency that the Patent and Trademark Office is already exhibiting in its deployment of AI-based search tools.<sup>188</sup>

To do this, PEQIA’s authors should amend the bill to include language directing the Patent and Trademark Office to “implement artificial intelligence-based technologies to improve the prior art searching process, namely for software

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<sup>180</sup> See Michael Henry, *What Is Prior Art?*, HENRY PAT. L. (Sept. 7, 2017), <https://henry.law/blog/what-is-prior-art/> (on file with the *University of the Pacific Law Review*).

<sup>181</sup> Landau, *supra* note 95.

<sup>182</sup> Eric Goldman, *The Problems with Software Patents (Part 1 of 3)*, FORBES (Nov. 28, 2012), <https://www.forbes.com/sites/ericgoldman/2012/11/28/the-problems-with-software-patents/?sh=53afc1a14391> (on file with the *University of the Pacific Law Review*).

<sup>183</sup> See *id.* (“This means that when there’s a watershed technological change—like the initial wave of software patent applications—the examiners don’t see a lot of applicable prior art in their existing patent database.”); see also *Top Disruptive Technologies to Watch Out for in 2022*, SIMPLILEARN (Oct. 7, 2022), <https://www.simplilearn.com/top-disruptive-technologies-article> (on file with the *University of the Pacific Law Review*) (“Disruptive technology is an innovation that causes major change in the way consumers, businesses and industries operate.”).

<sup>184</sup> See *Helsinn Healthcare v. Teva Pharms.*, 586 U.S. 1, 3 (2019) (describing time-consuming and costly litigation initiated by a patent holder, only for the court to hold the previously-held patent invalid); see also Landau, *supra* note 95 (explaining the patent examiners have only an average of 19 hours to spend on even the most complex patent applications).

<sup>185</sup> Hirshfield, *supra* note 22; see also Akshay Vashishtha, *Applying First Principle Thinking for Invalidating a Software Patent*, GREYB, <https://www.greyb.com/blog/invalidating-a-software-based-patent/> (last visited Mar. 5, 2023) (on file with the *University of the Pacific Law Review*) (noting that prior art for software inventions exists in the codebases of other software applications, not necessarily in previously filed software-based patents).

<sup>186</sup> Hirshfield, *supra* note 22.

<sup>187</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>188</sup> *Id.*; Hirshfield, *supra* note 22.

inventions.”<sup>189</sup> Investing in the continued research, development, and testing of AI search tools has potential to increase the amount of prior art captured in software patent applications.<sup>190</sup> Discovery of more prior art will result in less improperly issued software patents, and less invalid patents will lead to less expenses for “unsuspecting Americans and small businesses.”<sup>191</sup> It would be inefficient for PEQIA to generally evaluate what “constitutes patent quality” when the Patent and Trademark Office has an existing solution: the explosion of AI inventions requires AI-based search tools.<sup>192</sup> Thus, PEQIA’s authors should amend PEQIA to meet the Patent and Trademark Office’s simple, yet clear, focus in driving AI adoption in the examination process.<sup>193</sup>

*B. PEQIA Should Direct the Patent and Trademark Office Director to Coordinate With Federal Agencies on Enhancing Examiner Technical Training*

PEQIA is also overly ambiguous in requiring the Patent and Trademark Office Director “improve the technical training of patent examiners...with respect to emerging areas of technology.”<sup>194</sup> The bill’s ambiguity lies in failing to prescribe the type of technical training that is the most successful among examiners: partnerships with federal agencies.<sup>195</sup> PEQIA should demand more coordinated action with federal agencies because of their mutually beneficial arrangement.<sup>196</sup>

For instance, in the Patent and Trademark Office’s partnership with the NOAA, examiners will receive advanced training on climate-related technologies, while NOAA researchers will learn how to protect IP rights.<sup>197</sup> In contrast, there is no mutually beneficial partnership in the PETTP—where examiners are relying on private industry experts to volunteer their time.<sup>198</sup> Thus, PEQIA’s authors should amend the bill, adding language requiring the Patent and Trademark Office to report how it will “coordinate with federal agencies to improve the technical training of examiners.”<sup>199</sup> Referencing the collaboration with the NOAA as a

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<sup>189</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>190</sup> Hirshfield, *supra* note 22.

<sup>191</sup> See Hirshfield, *supra* note 22 (explaining that “a complete prior art search is a critically important component of the patent examination process and the USPTO’s mission to issue reliable patent rights”); *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25.

<sup>192</sup> Hirshfield, *supra* note 22; *Tillis and Leahy Introduce Bipartisan Legislation to Improve Patent Quality*, *supra* note 25.

<sup>193</sup> See Hirshfield, *supra* note 22 (“These successes are demonstrating the value of applying AI to improve the agency operations and strengthen the IP system.”); Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>194</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>195</sup> NOAA, *U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168; Vidal, *supra* note 79.

<sup>196</sup> NOAA, *U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168.

<sup>197</sup> *Id.*

<sup>198</sup> See Yuri Eliezer, *3 Key Takeaways from the USPTO Patent Examiner Training*, FOUNDERSLEGAL (June 1, 2021), <https://founderslegal.com/3-key-takeaways-from-the-uspto-patent-examiner-training/> (on file with the *University of the Pacific Law Review*) (describing examiners were engaged during the trainings, but that speakers still had to be invited to come speak).

<sup>199</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

model, this requirement would “infuse new knowledge” into both the Patent and Trademark Office and its partner agency.<sup>200</sup> The Patent and Trademark Office and federal agencies working hand-in-hand to enhance technical training, while promoting IP protection for agency-derived innovations, will be a win for both examiners and researchers.<sup>201</sup>

To further enhance examiner training in advanced fields, the Patent and Trademark Office should collaborate with other science-based agencies under the United States Department of Commerce (DOC).<sup>202</sup> For example, the National Institute of Standards and Technology (NIST) is a small DOC-based agency tasked with enhancing U.S. innovation through “measurement science, standards, and technology.”<sup>203</sup> Although NIST scientists have acquired more than 650 patents, this is a modest number considering the range of NIST-supported innovations.<sup>204</sup> Using its partnership with the NOAA as a framework, the Patent and Trademark Office could similarly work with the NIST to protect the agency’s IP rights.<sup>205</sup> In exchange, NIST scientists could train examiners on emerging technologies—such as those measuring fossil fuel emissions—that will accelerate in adoption over the next decade.<sup>206</sup>

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<sup>200</sup> NOAA, *U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168.

<sup>201</sup> *Id.*

<sup>202</sup> See *About NIST*, NAT’L INST. STANDARDS TECH., <https://www.nist.gov/about-nist> (last visited Apr. 23, 2023) (on file with the *University of the Pacific Law Review*) (“NIST is one of the nation’s oldest physical science laboratories.”).

<sup>203</sup> *Id.*; see also *NIST’s Real Impact on Innovation and Quality of Life*, NAT’L INST. STANDARDS TECH. (June 18, 2023), <https://www.nist.gov/feature-stories/nists-real-impact-innovation-and-quality-life> (on file with the *University of the Pacific Law Review*) (noting “NIST’s nearly 120 years of research to advance measurement science, standards and technology have had significant impacts on American innovation and quality of life. This is remarkable for a small federal agency focused on developing practical solutions to the nation’s ever-changing technology needs”).

<sup>204</sup> See *NIST’s Real Impact on Innovation and Quality of Life*, NAT’L INST. STANDARDS TECH. (June 18, 2023), <https://www.nist.gov/feature-stories/nists-real-impact-innovation-and-quality-life> (on file with the *University of the Pacific Law Review*) (“Historically, NIST’s annual patent and licensing numbers may seem modest. The number of new NIST-assigned patents rarely exceeds 20 per year... The modest numbers are due in part to shifting priorities and fluctuating emphasis on patenting over the years.”).

<sup>205</sup> NOAA, *U.S. Patent and Trademark Office Create Work-sharing Program to Advance Green Technology*, *supra* note 168; *About NIST*, NAT’L INST. STANDARDS TECH., <https://www.nist.gov/about-nist> (last visited Apr. 23, 2023) (on file with the *University of the Pacific Law Review*).

<sup>206</sup> See *New Method for Identifying Carbon Compounds Derived from Fossil Fuels*, NAT’L INST. STANDARDS TECH. (Sept. 12, 2017), <https://www.nist.gov/news-events/news/2017/09/new-method-identifying-carbon-compounds-derived-fossil-fuels> (on file with the *University of the Pacific Law Review*) (noting that the NIST’s new instrument measuring fossil fuel emissions “will open the way for new methods in the biofuels and bioplastics industries, in scientific research, and environmental monitoring”).

## V. CONCLUSION

As long as the United States seeks to continue functioning as a world economic leader in the twenty-first century, patent examiners will play a crucial role.<sup>207</sup> At the frontlines of thoroughly examining applications and issuing valid patents for entrepreneurs, examiners help bring valuable products to market and create jobs.<sup>208</sup> Thus, examiners are crucial to protecting—and enhancing—United States innovation.<sup>209</sup> However, due to the explosion of patent applications incorporating advanced technologies, what qualified as a thorough prior art search just a decade ago is not sufficient today.<sup>210</sup> To continue supporting innovation in the United States, examiners need access to AI-based search tools at the very beginning of the patent examination process.<sup>211</sup> PEQIA advances the right intentions in seeking to enhance patent quality by directing more resources to examiners.<sup>212</sup> However, PEQIA must go further by offering specific solutions—not broad evaluations—that the Patent and Trademark Office is already implementing.<sup>213</sup> Specifically, PEQIA should meet the Patent and Trademark Office’s urgency, prioritizing deployment of AI-based prior art search technologies and formally coordinating with federal agencies to enhance technical training.<sup>214</sup> With these amendments, Congress will signal its unwavering support for advancing the IP Clause’s mission—“promote the Progress of Science and useful Arts”—in the twenty-first century.<sup>215</sup>

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<sup>207</sup> See *Complete Guide to a Career as a Patent Examiner*, PAT. EDUC. SERIES (June 4, 2021), <https://www.patenteducationseries.com/patent-career/patent-examiner-career.html> (on file with the *University of the Pacific Law Review*) (“As long as people have good ideas, the need for patent professionals will exist.”).

<sup>208</sup> *Become a Patent Examiner*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/jobs/become-patent-examiner> (last visited Jan. 8, 2023) (on file with the *University of the Pacific Law Review*).

<sup>209</sup> Amir Adibi, *Behind the Scenes at the Patent Office: What Do Patent Examiners Do?*, PATENTLAWYER (Apr. 4, 2017) <https://patentlawyer.io/behind-scenes-patent-office-patent-examiners> (on file with the *University of the Pacific Law Review*).

<sup>210</sup> See Landau, *supra* note 95 (“The PTO hasn’t had a comprehensive reform to their examination time system since the 1970s.”).

<sup>211</sup> See *id.* (“Director Lancu has a perfect opportunity to complete the time study and increase examination allocations in order to make sure that the U.S. patent system produces ‘high-quality IP rights that give owners and the public alike confidence in those rights.’”).

<sup>212</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>213</sup> *Id.*; see also Gene Quinn, *Tillis Addresses Criticism of His Eligibility Reform Bill, Warns WD of TX Not to Backtrack on Standing Order*, IPWATCHDOG (Aug. 31, 2022), <https://ipwatchdog.com/2022/08/31/tillis-addresses-criticism-eligibility-reform-bill-warns-wd-tx-not-backtrack-standing-order/id=151211/> (on file with the *University of the Pacific Law Review*) (noting Senator Tillis’s comments that PEQIA “takes into consideration the many component parts that comprise quality”); Hirshfield, *supra* note 22.

<sup>214</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022).

<sup>215</sup> Patent Examination and Quality Improvement Act of 2022, S. 4704, 117th Cong. §4 (2022); *Overview of Congress’s Power over Intellectual Property*, CONGRESS.GOV, [https://constitution.congress.gov/browse/essay/artl-S8-C8-1/ALDE\\_00013060](https://constitution.congress.gov/browse/essay/artl-S8-C8-1/ALDE_00013060) (last visited Oct. 30, 2022) (on file with the *University of the Pacific Law Review*).