

# RAZING THE PATENT BAR

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*Innovation is vital to economic prosperity, and lawmakers consequently strive to craft patent laws that efficiently promote the discovery and commercialization of new inventions. Commentators have long recognized that legal fees are a significant cost affecting innovation, but remarkably a crucial driver of these costs has largely escaped scrutiny: the Patent Bar. Every year innovators spend billions of dollars on legal fees for representation in the U.S. Patent and Trademark Office (“USPTO”), where inventors apply for patents and potential infringers seek to invalidate issued patents. Supply in this essential legal services market, however, is sharply limited because patent law requires innovators to select representation from the ranks of the Patent Bar, which only extends membership to persons with extensive technical educations, like engineering degrees. Although this educational requirement bars entry in a market that is critical to innovation, scholars, lawmakers, and commentators have largely ignored this feature of the Patent Bar.*

*This Article begins to fill this void and demonstrates that the technical-education requirement of the Patent Bar lacks economic justification. This Article explains that a trade-off lies at the heart of efficient occupational licensing: licensing creates harmful barriers to entry in regulated markets, but can also improve the quality of services offered in that market, thus helping those markets to function more effectively. In the case of the Patent Bar, however, service quality improvements have not been—and likely cannot be—shown to justify the*

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*deleterious market effects. Paradoxically, the USPTO's misguided efforts to ensure quality service actually threatens to undermine innovation by raising the cost of patent acquisition and other services in the USPTO.*

*Accordingly, this Article proposes that the labor market for representation in the USPTO be expanded by making lawyers without technical educations eligible to join the Patent Bar. This Article details barriers to this proposal, including the revolving-door relationship between the USPTO and the Patent Bar. In light of these concerns, this Article recommends avenues for effecting the proposed reforms.*

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## INTRODUCTION

Innovation is critical to the vitality of the U.S. economy, and patent law is one of the primary legal tools for promoting innovation.<sup>1</sup> Patent law promotes investment in discovering and commercializing new inventions by giving inventors exclusive rights to their discoveries.<sup>2</sup> Unfortunately, however, patent law

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1. William Hubbard, *The Competitive Advantage of Weak Patents*, 54 B.C. L. REV. 1909, 1910 (2013).

2. See 35 U.S.C. § 271 (2012).

also imposes certain costs on both innovators and society. For example, patent litigation often costs patent owners and alleged infringers millions of dollars in legal fees.<sup>3</sup> Moreover, the U.S. Patent and Trademark Office (“USPTO”) frequently issues invalid patents, which causes businesses to face substantial costs when they are accused of infringing such patents, particularly because issued patents are presumed valid in lawsuits until proven otherwise by clear and convincing evidence.<sup>4</sup> Maximizing economic efficiency is thus the central problem in patent law today.<sup>5</sup> Accordingly, commentators, lawmakers, and scholars attempt to craft reforms that substantially reduce costs while largely preserving the benefits of the patent system. For instance, Congress recently considered bills designed to reduce the legal costs of patent litigation.<sup>6</sup>

Curiously, little attention has been paid to one of the key drivers of the legal costs facing inventors and potential infringers: the Patent Bar. Each year, inventors spend approximately \$9 billion on legal fees related to filing patent applications in the USPTO,<sup>7</sup> and patent owners and their competitors together

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3. AM. INTELLECTUAL PROP. LAW. ASS’N, REPORT OF THE ECONOMIC SURVEY 2013, at 34–38 (2013) [hereinafter AIPLA 2013].

4. 35 U.S.C. § 282 (2012); Microsoft Corp. v. i4i Ltd. P’ship, 564 U.S. 91, 97 (2011).

5. See MICHELE BOLDRIN & DAVID K. LEVINE, AGAINST INTELLECTUAL MONOPOLY 158 (2008) (describing the traditional view of patent law); DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 7 (2009) (“The idea behind the patent system is simple: invention is a ‘public good’ because it is expensive to invent but cheap to copy those inventions.”); F. SCOTT KIEFF ET AL., PRINCIPLES OF PATENT LAW 64–68 (6th ed. 2013); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 4 (2003) (“Today it is acknowledged that analysis and evaluation of intellectual property law are appropriately conducted within an economic framework that seeks to align that law with the dictates of economic efficiency.”); ROBERT P. MERGES ET AL., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 127 (4th ed. 2007) (“Patent law provides a market-driven incentive to invest in innovation, by allowing the inventor to appropriate the full economic rewards of her invention.”); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 629 n.11 (2002) (citing “literature [that models] intellectual property in terms of rents and product markets,” and stating that a complete list of such citations “would be impossible here”); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 357–58, 377 (2010) (describing the “reward” of exclusive patent rights as a “dominant justificatory theor[y] of patent law” that “largely motivates current patent doctrine”); Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 U. COLO. L. REV. 467, 470 (2008) (“[D]iscussions of patent law and policy have for the most part remained rooted in the paradigm of commercial sale as motivation for invention, disclosure, and dissemination of technical advances.”).

6. E.g., Innovation Act, H.R. 9, 114th Cong. (2015); The Protecting American Talent and Entrepreneurship Act (PATENT Act), S. 1137, 114th Cong. (2015).

7. In 2001, Mark Lemley estimated the total annual cost of domestic patent prosecution at \$4.33 billion based on the following: (1) a “conservative average estimate of \$20,000 per initial application taken through prosecution”; (2) a “conservative cost estimate of \$5,000 per continuation application”; (3) an estimated 28.4% of patents being continuation patents; and (4) a total of 275,000 patent applications being filed. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1499 (2001). In 2014 and 2015, inventors filed 578,802 and 589,410 patent applications, respectively.

spend more than \$600 million dollars each year on administrative procedures challenging the validity of issued patents in the USPTO. With all dollar figures in the thousands, Table 1 summarizes this calculation.<sup>8</sup>

	Historical			2015		2016	
	Num.	Pcnt.	Avg. Fees	Num.	Est. Cost	Num.	Est. Cost
<b>Petitions</b>	4,220	–	\$125	1,737	\$217,125	1,565	\$195,625
<b>Responses</b>	–	–	\$125	1,326	\$165,750	1,238	\$154,750
<b>Motion Practice</b>	2,216	53%	\$104	912	\$189,723	822	\$170,937
<b>PTAB Decision</b>	1,441	34%	\$105	593	\$124,558	534	\$112,224
<b>Totals</b>	–	–	–	–	<b>\$697,156</b>	–	<b>\$633,535</b>

**Table 1:** Summary of Annual Cost of Administrative Challenges (in thousands)

The group of legal specialists receiving these fees is relatively small because only members of the Patent Bar are allowed to represent inventors in the

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USPTO, U.S. PATENT STATISTICS CHART CALENDAR YEARS 1963 – 2015 (June 15, 2016), [http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us\\_stat.htm](http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm). Updating Lemley's calculation with these current application numbers provides yearly estimates of more than \$9 billion spent by inventors on patent prosecution each year.

8. The lion's share of administrative patent challenges in the USPTO are *inter partes* reviews. USPTO, PATENT TRIAL AND APPEAL BOARD STATISTICS 3 (Jan. 31, 2017), [https://www.uspto.gov/sites/default/files/documents/aia\\_statistics\\_january2017.pdf](https://www.uspto.gov/sites/default/files/documents/aia_statistics_january2017.pdf). Determining the amount spent on legal fees in these proceedings is difficult, in part because the cost of an *inter partes* review naturally depends on the duration of the dispute. An *inter partes* review begins with a patent challenger filing a petition with the USPTO. 35 U.S.C. § 311(a) (2012). The patent owner may file an opposition but is not required to do so. *Id.* § 313 (2012). If the USPTO initiates proceedings, the case enters a motion practice stage. *See* 37 C.F.R. §§ 42.120–42.123 (2016). Ultimately, the dispute will be resolved by the Patent Trial and Appeal Board (“PTAB”), in some cases following a hearing. 35 U.S.C. §§ 316, 318 (2012). The USPTO reports the number of *inter partes* review petitions filed each year and the number of oppositions to those petitions. USPTO, PATENT TRIAL AND APPEAL BOARD STATISTICS *supra*. For recent years, the USPTO also provides aggregate data on the number of *inter partes* reviews that have been instituted and thus reached the motions stage and the number of proceedings that have been resolved by the PTAB. *Id.* Using this data, the percentages of *inter partes* review petitions that generate proceedings that reach the later stages can be calculated. When combined with the number of petitions filed each individual year, these percentages provide an estimate of the number of proceedings that reach the later stages of *inter partes* reviews. To calculate legal costs, the number of *inter partes* reviews that reach different stages can be multiplied by the average litigation costs for each stage. The American Intellectual Property Law Association provides these average litigation costs based on surveys from practicing lawyers. AM. INTELLECTUAL PROP. LAW. ASS'N, REPORT OF THE ECONOMIC SURVEY 2015, at I-139 (2015) [hereinafter AIPLA 2015]. Some of these costs must be doubled as both sides in an IPR incur these costs.

USPTO.<sup>9</sup> Since its formation in the early part of the twentieth century, the USPTO has admitted around 70,000 members to the Patent Bar, but less than 45,000 are currently registered as “active.”<sup>10</sup> Moreover, due to retirement and death, the number of Patent Bar members who are actually representing clients in the USPTO is closer to 26,000.<sup>11</sup> Many of these members have no formal legal training because, unlike other legal bars, a law degree is not required for Patent Bar membership. Nonlawyers who join the Patent Bar are called “patent agents” and are permitted to perform all of the same services in the USPTO as patent attorneys.<sup>12</sup>

The small size of the Patent Bar is surprising, given the powerful economic incentives that exist to join the Patent Bar.<sup>13</sup> The average patent practitioner can likely expect to receive more than \$300,000 in legal fees each year.<sup>14</sup> Indeed, in recent years both patent agents and patent attorneys have been identified as one of the “100 Best Jobs in America,” with median salaries of

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9. 37 C.F.R. § 11.10 (2016). There are limited exceptions to the requirement that a person be a member of the Patent Bar to represent an inventor in patent proceedings before the USPTO. For example, “[a]ny individual not registered under § 11.6 may, upon a showing of circumstances which render it necessary or justifiable . . . be given limited recognition . . . to prosecute as attorney or agent a specified patent application or specified patent applications.” *Id.* § 11.9. Similarly, the Patent Trial and Appeals Board can allow a person who is not a member of the Patent Bar to appear pro hac vice in a proceeding before the Board. *Id.* § 41.5.

10. The 70,000 number is based on the sequentially issued bar number that each member of the Patent Bar receives. These were reviewed at *List/Roster of Active Patent Attorneys and Agents with Licenses to Practice Before the USPTO*, DATA.GOV, <https://catalog.data.gov/dataset/list-roster-of-active-patent-attorneys-and-agents-with-licenses-to-practice-before-the-usp> (last visited Mar. 24, 2017).

11. Dennis Crouch, *Estimate: Fewer than 26,000 Active US Patent Attorneys & Agents*, PATENTLY-O (Jan. 13, 2012), <http://patentlyo.com/patent/2012/01/the-uspto-records-identify-more-than-41750-active-registered-practitioners-that-number-is-obviously-wrong-because-many-folk.html>.

12. Today, about one-fourth of Patent Bar members are patent agents. See *Persons Recognized to Practice in Patent Matters*, USPTO, <https://oedci.uspto.gov/OEDCI/> (last visited Feb. 21, 2017) (stating that 11,325 of 45,157 practitioners are agents).

13. In addition to being financially attractive, being a member of the Patent Bar confers other benefits for lawyers. For example, a lawyer who is a member of a state bar is licensed to practice law only in that state, while a member of the Patent Bar is able to provide legal services to inventors anywhere in the United States. See *Sperry v. Florida*, 373 U.S. 379, 384–89, 404 (1963).

14. As noted earlier, the total fees spent by inventors on patent prosecution is more than \$9 billion but there are only 26,000 actively working patent agents and attorneys. See *supra* note 7 and accompanying text (estimating the total fees); *supra* note 10 and accompanying text (estimating the number of actively working patent agents and attorneys). Dividing the total fees by the number of active patent practitioners yields an average billing amount of \$346,154. Market surveys confirm this estimate, indicating that even nonattorney patent agents bill inventors more than \$320,000 each year for their services, with patent attorneys charging even more. AIPLA 2015, *supra* note 8, at I-6 (\$407,828); AIPLA 2013, *supra* note 3, at I-8 (\$321,254).

\$126,000 and \$175,000, respectively.<sup>15</sup> In sharp contrast, the median income for all lawyers is only \$115,820.<sup>16</sup>

One reason for the small size of the Patent Bar might be that the Patent Bar exam, which is analogous to a state bar exam, screens out many would-be members. However, it is unlikely that the exam prevents many people from joining the Patent Bar, particularly lawyers, because the exam tests an applicant's knowledge of the applicable legal procedures in the USPTO, not technical or scientific knowledge.<sup>17</sup> Even the procedural matters tested by the exam evidently do not present substantial hurdles to passage, given that the majority of new members to the Patent Bar have no legal training whatsoever. Rather, they are scientists and engineers seeking to become patent agents.<sup>18</sup> Every lawyer has training in legal procedure, and many have practical experience, making lawyers at least as capable of passing the procedurally focused Patent Bar exam as engineers and scientists. Indeed, some lawyers have additional experience or training that might help them pass, such as familiarity with administrative law and other types of intellectual property law, like trademark law. Moreover, some lawyers may have substantial expertise in patent law even though they were not trained as engineers or scientists because Patent Bar membership is not required to represent clients in patent lawsuits in federal court.<sup>19</sup>

But the more likely reason that more lawyers do not join the Patent Bar is that the USPTO requires that a person have an extensive educational background in science or engineering to take the Patent Bar exam.<sup>20</sup> The prerequisite technical

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15. Emily Jane Fox, *100 Best Jobs in America: Patent Agent*, CNN MONEY (Feb. 16, 2015, 4:08 PM), <http://money.cnn.com/gallery/pf/2015/01/27/best-jobs-2015/4.html>; *100 Best Jobs in America: Patent Attorney*, CNN MONEY (Nov. 12, 2012), [http://money.cnn.com/pf/best-jobs/2013/snapshots/49.html?iid=BestJobs\\_fl\\_list](http://money.cnn.com/pf/best-jobs/2013/snapshots/49.html?iid=BestJobs_fl_list). Other sources report even higher salary figures. See, e.g., AIPLA 2015, *supra* note 8, at I-4 (reporting that patent agents receive an average of \$151,393 in salaries and bonuses).

16. *Lawyers*, BUREAU LABOR STAT. OCCUPATIONAL OUTLOOK HANDBOOK (Dec. 17, 2015), <http://www.bls.gov/ooh/legal/lawyers.htm#tab-1>. The average starting salary for new attorneys working in private practice is less than \$85,000. NAT'L ASS'N FOR LAW PLACEMENT, CLASS OF 2015 NATIONAL SUMMARY REPORT (2016), <http://www.nalp.org/uploads/NatlSummaryClassof2015.pdf>. In fact, for many recent graduates, even lower paying jobs are hard to find. Dimitra Kessenides, *Jobs Are Still Scarce for New Law School Grads*, BLOOMBERG (June 20, 2014, 5:44 AM), <http://www.bloomberg.com/bw/articles/2014-06-20/the-employment-rate-falls-again-for-recent-law-school-graduates>.

17. Christi Guerrini, *The Decline of the Patent Registration Exam*, 91 NEB. L. REV. 325, 348–49, 385 (2012).

18. Dennis Crouch, *Attorney v. Agent*, PATENTLY-O (Aug. 24, 2010), <http://patentlyo.com/patent/2010/08/attorney-versus-agent.html>; see *infra* Section I.A (discussing the USPTO's eligibility criteria for a person to take the patent bar exam).

19. Moreover, numerous private companies provide courses for preparing to take the Patent Bar exam. See, e.g., PATBAR, <http://patbar.com/> (last visited Feb. 18, 2017); PLI's *Patent Office Exam Course*, PRACTICING L. INST., <http://www.pli.edu/patentofficeexamcourse/default.aspx> (last visited Feb. 18, 2017).

20. OFFICE OF ENROLLMENT & DISCIPLINE, USPTO, GENERAL REQUIREMENTS BULLETIN FOR ADMISSION TO THE EXAMINATION FOR REGISTRATION TO PRACTICE IN PATENT CASES BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE 4–9 (2015) [hereinafter

background is highly specific, requiring either an undergraduate degree in engineering or natural sciences, or completion of a substantial number of credits in engineering or hard-science courses, like physics and chemistry.<sup>21</sup> Few lawyers graduating from law school today possess these educational credentials.<sup>22</sup>

The USPTO's power to preclude attorneys from representing clients on patent matters is also unique among federal administrative agencies. For all other agencies, lawyers are presumptively qualified to represent clients even though some federal agencies deal with exceedingly arcane technology, such as the Environmental Protection Agency's work related to pollutants.<sup>23</sup> On issues of trademark law, the USPTO likewise adheres to this nearly universal approach, allowing "any individual who is an attorney . . . [to] represent others before the Office in trademark and other non-patent matters."<sup>24</sup> Only in the USPTO, and only on patent matters, are attorneys required to possess additional educational credentials to represent clients.<sup>25</sup>

Although the technical-education requirement is unique among federal agencies, and even though the Patent Bar is surprisingly small given the enviable market position that Patent Bar members enjoy, the USPTO has provided little justification for the requirement. For example, it has never been the subject of

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GENERAL REQUIREMENTS BULLETIN], [http://www.uspto.gov/sites/default/files/OED\\_GRB.pdf](http://www.uspto.gov/sites/default/files/OED_GRB.pdf).

21. *Id.*

22. See *infra* Section II.E (describing the slow growth in the Patent Bar in recent years).

23. Under the APA, "[a]n individual who is a member in good standing of the bar of the highest court of a State may represent a person before an agency . . ." 5 U.S.C. § 500(b) (2012). The EPA administers technologically complex regulations, including requiring sulfur emissions' calculations in eight-hour intervals using the following equation:

$$S_f = \sum_{i=1}^n \frac{S_i Q_i}{Q_f}$$

The regulation defines the variables in this equation as follows:

$S_f$  = fresh feed sulfur content expressed in percent by weight of fresh feed.

$n$  = number of separate fresh feed streams charged directly to the riser or reactor of the fluid catalytic cracking unit.

$Q_f$  = total volumetric flow rate of fresh feed charged to the fluid catalytic cracking unit.

$S_i$  = fresh feed sulfur content expressed in percent by weight of fresh feed for the "ith" sampling location.

$Q_i$  = volumetric flow rate of fresh feed stream for the "ith" sampling location.

40 C.F.R. § 60.106 (2016).

24. 37 C.F.R. § 11.14 (2016).

25. 5 U.S.C. § 500(e); 37 C.F.R. §11.14.

notice-and-comment procedures under the Administrative Procedure Act (“APA”).<sup>26</sup> From time to time, the USPTO summarily asserts that the technical-education requirement protects the public from “unqualified practitioners,” but the USPTO has not explained why the invisible hand of the market cannot match inventors with qualified patent practitioners. Legal scholars, likewise, have not analyzed the tradeoffs inherent in the technical-education requirement, in marked contrast to the wealth of scholarship analyzing the costs stemming from patent litigation and from invalid patents.<sup>27</sup> This paucity of analysis is particularly striking given that “among technology startups, the cost of getting a patent is the most common reason cited for not patenting a major technology.”<sup>28</sup> In contrast, occupational-licensing regimes have been closely analyzed in other areas of law by scholars and lawmakers alike, including the U.S. Supreme Court.<sup>29</sup>

This Article therefore seeks to fill this void in the scholarly literature by analyzing the economic consequences of the Patent Bar’s technical-education requirement. Presumably, the USPTO would assert that licensing is needed to guarantee that all patent attorneys and agents possess some minimum level technical sophistication. However, economists have long recognized that an inevitable side effect of occupational licensing is to erect barriers to entry that limit supply in labor markets, which in turn increases the prices borne by consumers.<sup>30</sup>

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26. See *infra* Section II.B (discussing the applicability of the APA to the technical-education requirement).

27. A small group of scholars have examined particular aspects of the structure of the Patent Bar. See Michelle J. Burke & Thomas G. Field, *Promulgating Requirements for Admission to Prosecute Patent Applications*, 36 IDEA 145, 150–56 (1995) (asserting that the technical-education requirement violates the APA, particularly as applied to computer science majors); Ralph D. Clifford et al., *A Statistical Analysis of the Patent Bar: Where Are the Software-Savvy Patent Attorneys?*, 11 N.C. J. L. & TECH. 223 *passim* (2010) (empirically studying the technical backgrounds of members of the Patent Bar to argue that “too few attorneys and agents have relevant experience in the most often patented areas today, such as computer science”); Nicholas Matich, *Patent Office Practice After the America Invents Act*, 23 FED. CIR. BAR J. 225 *passim* (2013) (arguing that the technical-education requirement violates the APA); Kenneth L. Port et al., *Where Have All the Patent Lawyers Gone? Long Time Passing . . .*, 97 J. PAT. & TRADEMARK OFF. SOC’Y 193, 199–203 (2015) (analyzing the percentage of members of the Patent Bar who are women); Corey B. Blake, Note, *Ghosts of the Past: Does the USPTO’s Scientific and Technical Background Requirement Still Make Sense?*, 82 TEX. L. REV. 735 *passim* (2004) (arguing that the technical-education requirement should be expanded to allow persons with degrees in design and business because inventions in those areas are eligible for patent protection). See generally Guerrini, *supra* note 17 (tracing the history of the Patent Bar exam and proposing improvements).

28. Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. LJ. 1256, 1310 (2010).

29. See, e.g., N.C. State Bd. of Dental Examiners v. FTC, 135 S. Ct. 1101, 1115–16 (2015); Aaron Edlin & Rebecca Haw, *Cartels by Another Name: Should Licensed Occupations Face Antitrust Scrutiny*, 162 U. PA. L. REV. 1093, 1098–99 (2014) (listing critiques of occupational licensing in the popular media and among politicians).

30. Morris M. Kleiner, *Occupational Licensing*, 14 J. ECON. PERSP. 189, 192, 197 (2000); Thomas G. Moore, *The Purpose of Licensing*, 4 J.L. & ECON. 93, 104 (1961);

Unfortunately, some consumers will not be able to afford these higher prices, and the exclusion of these consumers from the market reduces social welfare.<sup>31</sup> However, in some contexts occupational licensing is nevertheless justified because it cures various market defects, thereby generating sufficient economic benefits to offset the inevitable harms.<sup>32</sup> This Article examines whether these economic rationales can be applied to the Patent Bar, and concludes that, at least as applied to lawyers, the technical-education requirement is not—and likely cannot be—supported and should thus be reformed.

This Article proceeds in five parts. Part I begins by identifying the costs and benefits of occupational licensing generally recognized by economists. Because the USPTO has not provided a sufficient economic justification for the technical-education requirement, Part I also attempts to build, from the economic literature, the strongest plausible justification for the requirement. Part II, however, demonstrates the inevitable inadequacies of any such justification in light of modern legal and technical realities. Accordingly, Part III proposes an economically efficient expansion to the Patent Bar: eliminating the technical-education requirement for lawyers. In developing a roadmap to implement these reforms, Part III reviews previous failed attempts to expand the Patent Bar and analyzes the USPTO's economic incentives to maintain an inefficiently small Bar. Finally, this Article briefly concludes with a short summary of the arguments presented in the Article.

## I. SIMPLE JUSTIFICATIONS FOR THE PATENT BAR

### A. Current Requirements for Patent Bar Membership

The Patent Act grants the USPTO the power to regulate “the recognition and conduct of agents, attorneys, or other persons representing applicants or other parties before the Office” and to require that they possess “the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance.”<sup>33</sup> Pursuant to this power, the USPTO created formal regulations requiring that applicants to the Patent Bar possess “legal, scientific, and technical

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Carl Shapiro, *Investment, Moral Hazard, and Occupational Licensing*, 53 REV. ECON. STUD. 843, 844 (1986). See generally Hayne E. Leland, *Quacks, Lemons, and Licensing: A Theory of Minimum Quality Standards*, 87 J. POL. ECON. 1328 (1979).

31. See Edlin & Haw, *supra* note 29, at 1114–16; Kleiner, *supra* note 30, at 197; Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 850; see also ROGER S. FRANTZ, X-EFFICIENCY: THEORY, EVIDENCE, AND APPLICATIONS 21 (1988) (discussing deadweight loss); Yoram Barzel, *Measurement Costs and the Organization of Markets*, J.L. & ECON. 27, 29 (1982) (noting that buyers may be averse to variability in purchased goods and services); cf. GREGORY MANKIW, PRINCIPLES OF MICROECONOMICS 178 (6th ed. 2012) (discussing deadweight loss in the context of tariffs).

32. See Kleiner, *supra* note 30, at 191–92; Leland, *supra* note 30, at 1329; Moore, *supra* note 30, at 103; Shapiro, *supra* note 30, at 844; see also Wendy J. Gordon, *Fair Use As Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 COLUM. L. REV. 1600, 1607–08 (1982) (summarizing theory that markets promote economic efficiency absent some market failures, in which case government regulation may increase welfare more than an unregulated market).

33. 35 U.S.C. § 2(b)(2)(D) (2012).

qualifications.”<sup>34</sup> The USPTO has not, however, promulgated further regulations elaborating upon the required qualifications. Instead, the USPTO clarified the requirements through an ostensibly nonbinding publication generally referred to as the “General Requirements Bulletin” (“the Bulletin”), which describes three categories (A, B, and C) for demonstrating that an applicant possesses the requisite scientific and technical training.<sup>35</sup>

Under “Category A,” applicants that possess bachelor’s degrees in 1 of 32 enumerated science and engineering disciplines, such as physics or electrical engineering, automatically satisfy the requirement for a technical education.<sup>36</sup> Category A includes computer science as an acceptable degree, but only from specially accredited programs.<sup>37</sup> Some degrees, however, are explicitly excluded from Category A, including biological sciences, pharmacy, and mechanical technology.<sup>38</sup> Moreover, only a bachelor’s degree is acceptable under Category A; a doctorate or other advanced degree does not qualify.<sup>39</sup>

Under “Category B,” applicants can demonstrate that, while lacking undergraduate degrees listed in Category A, they nevertheless have taken a sufficient number of credits to form the “equivalent” of a Category A degree.<sup>40</sup> The USPTO defines this “equivalence” in detail, specifying the number of credit hours that an applicant must take in different disciplines to qualify under Category B. For instance, an applicant can satisfy Category B’s requirements by taking “24

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34. 37 C.F.R. § 11.7(a)(ii) (2016).

35. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4–8. Whether the Bulletin should be treated as a regulation is discussed below in Sections III.B and III.D. The USPTO purports to retain the discretion in appropriate circumstances to allow an applicant to take the Patent Bar even if he or she lacks the qualifications of Categories A, B, or C, though the USPTO has not identified any cases in which that discretion has actually been exercised. *See Premysler v. Lehman*, 71 F.3d 387, 389–90 (Fed. Cir. 1995).

36. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4. The degrees are Biochemistry, Biology, Botany, Computer Science, Electronics Technology, Engineering Physics, Food Technology, General Chemistry, Marine Technology, Microbiology, Molecular Biology, Organic Chemistry, Pharmacology, Physics, Textile Technology, Aeronautical Engineering, Agricultural Engineering, Biomedical Engineering, Ceramic Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Electrochemical Engineering, General Engineering, Geological Engineering, Industrial Engineering, Mechanical Engineering, Metallurgical Engineering, Mining Engineering, Nuclear Engineering, and Petroleum Engineering. *Id.* at 4.

37. Computer science degrees are only accepted under Category A if they were issued from a school that was “accredited by the Computer Science Accreditation Commission (‘CSAC’) of the Computing Sciences Accreditation Board (‘CSAB’), or by the Computing Accreditation Commission (‘CAC’) of the Accreditation Board for Engineering and Technology (‘ABET’)” at the time that the degree was issued. *Id.*; *see, e.g.*, USPTO, DECISION ON PETITION FOR REVIEW 9–11, (Nov. 12, 1997), [http://e-foia.uspto.gov/Foia/RetrievePdf?system=OED&flNm=0115\\_TEC\\_1997-11-12](http://e-foia.uspto.gov/Foia/RetrievePdf?system=OED&flNm=0115_TEC_1997-11-12) (refusing to allow an applicant to take the Patent Bar exam in part because the applicant’s computer science degree issued from an institution that was not appropriately accredited).

38. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4–5.

39. *Id.* at 4.

40. *Id.* at 4–5.

semester hours in physics” or “30 semester hours in chemistry.”<sup>41</sup> Hybrid exposure to multiple technological fields can also satisfy Category B, though doing so requires a larger number of total credit hours. For example, an applicant can satisfy Category B’s standards by demonstrating that she has taken 40 semester hours in a combination consisting of (i) eight semester hours of chemistry or eight semester hours of physics, and (ii) 32 semester hours of chemistry, physics, biology, botany, microbiology, molecular biology, or engineering.<sup>42</sup> Certain coursework, however, is *per se* unacceptable under any variation described in Category B, including mathematics courses and patent law courses.<sup>43</sup>

Finally, under “Category C” an applicant can demonstrate sufficient technical credentials by passing a comprehensive engineering exam called the “Fundamentals of Engineering” test.<sup>44</sup> The National Council of Examiners for Engineering and Surveying develops this exam, and various state boards of engineering in each state use it for licensing purposes.<sup>45</sup> The exam is offered in seven engineering disciplines, such as “chemical” and “electrical and computer.”<sup>46</sup>

#### ***B. Economic Effects of Occupational Licensing***

Many professions are subject to licensing requirements. By one estimate, 20% of workers in the United States operate in professions subject to licensing, which is a larger portion of the labor economy than that affected by the minimum wage or unions.<sup>47</sup> As a result of the prominence of occupational licensing, economists have analyzed the asserted justifications and effects of licensing.<sup>48</sup> One commonly recognized explanation is that practitioners in regulated professions agitate for occupational licensing to reduce competition and raise their own

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41. *Id.*

42. *Id.* Some other coursework may be accepted under this section, including up to four semester hours in design engineering and drafting. *Id.* at 6.

43. *Id.* at 7. The USPTO further states that other factors may be considered “on a case-by-case basis with respect to scientific and technical training” and that the USPTO may consider other education, including “foreign education, academic credit for work experience, military education, life experiences, etc.” *Id.* at 7. In marked contrast, mathematics degrees qualify a person to take the qualifying examination to be a member of the European Patent Bar. EUROPEAN PATENT OFFICE, REGULATION ON THE EUROPEAN QUALIFYING EXAMINATION FOR PROFESSIONAL REPRESENTATIVES 24 (2014), <http://www.epo.org/law-practice/legal-texts/official-journal/2014/etc/se2/2014-se2.pdf>.

44. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 8.

45. FE Exam, NCEES, <http://nkees.org/exams/fe-exam/> (last visited Feb. 28, 2017).

46. *Id.* The other disciplines are “civil,” “environmental,” “industrial,” “mechanical,” and “other disciplines.” *Id.*

47. Morris M. Kleiner & Alan B. Krueger, *The Prevalence and Effects of Occupational Licensing*, 2010 BRITISH J. INDUS. REL. 1, 3; Kleiner, *supra* note 30, at 190. Over 800 occupations now require some form of licensing. Edlin & Haw, *supra* note 29, at 1102.

48. Kleiner, *supra* note 30, at 189 (“The study of the regulation of occupations has a long and distinguished tradition in economics.”).

profits.<sup>49</sup> While this view of licensing regimes may be descriptively accurate, it lacks normative support. Economists, therefore, have worked to assess whether and in what contexts licensing can increase economic efficiency, concluding that in three situations occupational licensing can improve service quality and thereby cure market defects.

First, occupational licensing may alleviate informational problems that sometimes arise in the purchase of services.<sup>50</sup> While service providers have information about the quality of services that they offer, consumers often cannot obtain this information before making purchasing decisions, in part because, unlike with physical goods, a buyer cannot inspect services before they are purchased.<sup>51</sup> Even after services have been rendered, consumers may lack the expertise needed to assess their quality.<sup>52</sup> For example, after receiving treatment, patients untrained in medicine may have difficulty evaluating whether their doctors were effective or were “quacks.”<sup>53</sup>

When consumers are unsure about service quality, affected markets function poorly. Consumers in need of high-quality services may be unable to confidently identify the appropriate suppliers, and this uncertainty may deter those customers from paying the higher prices necessary to support high-quality services. Customers fearful of “lemons” may be dissuaded from participating in the market altogether.<sup>54</sup> Consumers’ reluctance to pay higher prices may prevent service providers from making the necessary investments to improve or even maintain the quality of their services.

Occupational licensing can reduce informational asymmetries by cheaply demonstrating to consumers that members of a profession possess certain

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49. See Edlin & Haw, *supra* note 29, at 1103–04 (noting that licensing boards with financial interests in limiting competition “often succumb to the temptation of self-dealing, [by] creating regulations to insulate incumbents rather than . . . ensure public welfare”); Moore, *supra* note 30, at 110. See generally N.C. State Bd. of Dental Examiners v. FTC, 135 S. Ct. 1101 (2015) (noting that market participants may support regulation due to “private anticompetitive motives”).

50. Edlin & Haw, *supra* note 29, at 1115–16; Leland, *supra* note 30, at 1329; Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 850.

51. Leland, *supra* note 30, at 1329; Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 845. In this respect, informational asymmetries are less likely to occur with physical goods because a prospective buyer can often examine the qualities of a product before agreeing to buy. Shapiro, *supra* note 30, at 845. With some goods, however, a buyer cannot observe important qualities, like the safety of a commercial jet. See Leland, *supra* note 30, at 1339–40.

52. Leland, *supra* note 30, at 1329; Moore, *supra* note 30, at 105; Shapiro, *supra* note 30, at 845.

53. Leland, *supra* note 30, at 1329; Moore, *supra* note 30, at 105. Medical malpractice suits do not solve this informational asymmetry, as such claims can be difficult to prove and provide only a minimum floor for competence. See Leland, *supra* note 30, at 1330; Shapiro, *supra* note 30, at 845. Other mechanisms might also reduce informational asymmetries, like “repeat purchases, product labeling, and other forms of product information,” but some markets are poorly suited to these types of informational tools. See Leland, *supra* note 30, at 1330.

54. Edlin & Haw, *supra* note 29, at 1115–16.

qualifications. For example, lawyers must demonstrate basic legal competency by passing bar exams in order to practice law.<sup>55</sup> By eliminating service providers without the required credentials, the average quality of services available in the market improves, at least insofar as licensing requirements correlate with service quality. As a result, consumers may be willing to pay more for higher-quality services.<sup>56</sup> Similarly, service providers may be more likely to invest in improving service quality armed with greater confidence that those investments will increase revenue.<sup>57</sup>

A second justification for occupational licensing is that, in some circumstances, it protects customers from making decisions that are not in their own best interests.<sup>58</sup> For example, cognitive biases or bounded rationality may cause some customers to underestimate the risks involved with using low-quality service providers. To illustrate, consider a consumer who hires a handyman to perform electrical work because cognitive biases cause the consumer to underestimate the likelihood that shoddy work will produce an electrical fire.<sup>59</sup> The licensing of electricians in such a situation paternalistically protects individuals from their own shortsighted decisions.<sup>60</sup> When occupational licensing effectively protects consumers from their own costly mistakes, social welfare increases.

A third justification for occupational licensing is that buyers who use low-quality services may externalize costs to third parties.<sup>61</sup> This situation arises,

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55. Larry E. Ribstein, *Lawyers and Lawmakers: A Theory of Lawyer Licensing*, 69 Mo. L. REV. 299, 303 (2004). Some have argued, however, that the bar exam “provides little assurance of attorney competence.” *Id.* at 309. Moreover, some commentators assert that lawyers have “yielded to the temptation of self-dealing” to the detriment of consumers. Edlin & Haw, *supra* note 29, at 1108.

56. Kleiner, *supra* note 30, at 192, 198 (noting that improved quality of services may increase demand).

57. *Id.* at 191 (“Occupational licensure creates a greater incentive for individuals to invest in more occupation-specific human capital because they will be more able to recoup the full returns to their investment if they need not face low-quality substitutes for their services.”).

58. Moore, *supra* note 30, at 106–09.

59. See *id.* at 106 (discussing how licensing exists to protect overly optimistic consumers); see also RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 31–33 (2008) (describing the “optimism bias,” under which individuals are “unrealistically optimistic”); William Hubbard, *The Debilitating Effect of Exclusive Rights: Patents and Productive Inefficiency*, 66 FLA. L. REV. 2045, 2059–65 (2014) (discussing various reasons that individuals will not maximize their own welfare).

60. Economists contend that paternalistic occupational licensing is particularly beneficial to consumers where: (1) there is substantial variance in service quality; (2) the costs of insufficient services are substantial; (3) substantial training is necessary to assess service quality; and (4) consumers use the service infrequently. Moore, *supra* note 30, at 106. Of course, licensing criteria must correlate strongly with improved quality in order to benefit consumers, which is unlikely if lawmakers are as rationally impaired as consumers. See *id.* at 109–10; *infra* Section II.C (explaining the reluctance of the USPTO to reform the structure of the Patent Bar).

61. Edlin & Haw, *supra* note 29, at 1116–17; Kleiner, *supra* note 30, at 192; Moore, *supra* note 30, at 109–10.

for example, when a low-quality doctor misdiagnoses a disease, thereby allowing an individual infection to grow into an epidemic.<sup>62</sup> Occupational licensing would prevent the patient from relying on an incompetent doctor, thus preventing the outbreak. However, licensing would also raise the costs of medical services, so that the sick patient might not be able to afford any medical treatment at all, in which case the patient's illness also sparks an epidemic.<sup>63</sup> This justification for licensing thus applies only in limited contexts, such as when there are non-market alternatives to low-quality services (such as state-sponsored medical services) or when using low-quality services is worse than not using any service at all.<sup>64</sup>

While occupational licensing may produce benefits, it simultaneously raises costs and therefore reduces social welfare. To join an occupation that is subject to licensing, a person must invest additional resources to obtain the required credentials. In some cases, a portion of suppliers will not make this investment. As a result, the labor supply shrinks compared to an unregulated market, and prices rise.<sup>65</sup> Even if all suppliers invest in satisfying licensing criteria, prices will rise to reflect the additional cost of production. In either case, occupational licensing produces higher prices for consumers, with leading labor economists estimating that occupational licensing generates price increases of 10 to 15%.<sup>66</sup> Particularly cost-sensitive consumers will be unable to afford the licensed services, producing deadweight losses that reduce consumer welfare.<sup>67</sup>

Balancing costs and benefits is thus crucial in evaluating whether an occupational licensing scheme promotes economic efficiency.<sup>68</sup> Unfortunately, as with many issues of economic efficiency, these costs and benefits cannot be measured empirically, which prevents a precise calibration in close cases.<sup>69</sup> Three

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62. Kleiner, *supra* note 30, at 192; Moore, *supra* note 30, at 110.

63. See *infra* notes 64–66 and accompanying text (describing the costs inherent in occupational licensing).

64. Moore, *supra* note 30, at 110. Legal services might present an instance when an individual's use of low-quality services is worse for society than the individual proceeding without assistance. For example, a well-informed, rational client might use an unlicensed, low-quality lawyer to initiate spurious lawsuits to obtain nuisance settlements. Society may be better off if the client cannot obtain this low-quality representation.

65. Kleiner, *supra* note 30, at 192; Moore, *supra* note 30, at 104. Reduced competition may lead to service providers delivering lower-quality services. See Hubbard, *supra* note 59, at 2067–70.

66. Morris M. Kleiner & Alan B. Krueger, *Analyzing the Extent and Influence of Occupational Licensing in the Labor Market*, 31 J. LAB. ECON. S173, S179 (2013); see also Edlin & Haw, *supra* note 29, at 1113 (finding 10–12% price increase).

67. Edlin & Haw, *supra* note 29, at 1114–15; Kleiner, *supra* note 30, at 197; Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 850; see also FRANTZ, *supra* note 31, at 20–21 (discussing deadweight loss); GREGORY MANKIW, PRINCIPLES OF MICROECONOMICS 178 (6th ed. 2012) (same); Barzel, *supra* note 31, at 29 (noting that buyers are averse to variability in purchased goods and services).

68. Edlin & Haw, *supra* note 29, at 1111–12; Kleiner, *supra* note 30, at 198 (discussing the balancing of costs and benefits related to occupational licensing); Shapiro, *supra* note 30, at 844, 856 (same).

69. See, e.g., WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 9 (2003); Hubbard, *supra* note 1, at 1934; Peter Lee, *Toward a Distributive Commons in Patent Law*, 2009 Wis. L. Rev. 917, 931

general strategies are therefore useful in evaluating whether occupational licensing promotes economic efficiency.

First, occupational licensing schemes should be disfavored when the presence of market failures is unclear because licensing always produces costs in the form of higher prices but only sometimes produces benefits by curing market defects.<sup>70</sup> Importantly, many service markets operate effectively without licensing. For example, informational asymmetries have little effect in some markets because the presence or absence of key credentials is easy to assess even without licensing. Similarly, information about service quality may be provided through other means, such as reputational mechanisms.

Second, occupational licensing should be disfavored when licensing requirements poorly correlate with the service quality desired by many consumers.<sup>71</sup> For instance, requiring lawyers to speak Spanish before being admitted to the bar is unlikely to promote economic efficiency because many clients do not need their lawyers to speak Spanish.<sup>72</sup> Licensing is also less likely to promote efficiency when substantial numbers of consumers do not value higher-quality services, as such licensing schemes simply limit the market for services to “over trained” and more expensive professionals.<sup>73</sup> For instance, if a state were to require bar applicants to obtain both JD and LLM degrees, many consumers might object because the additional legal training may not be necessary in many contexts.

Finally, occupational licensing should be disfavored when there are less costly alternatives that achieve the same results. Informational problems, for example, can also be addressed through certification schemes, whereby service providers who meet certain requirements receive a special designation. Unlike

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(asserting that “the patent system does not engage, nor is it equipped to engage, in macroscopic cost-benefit analyses to determine the ideal scope of particular exclusive rights”): Margaret Jane Radin, *Regulation by Contract, Regulation by Machine*, 160 J. INSTITUTIONAL & THEORETICAL ECON. 1, 7 (2004) (“How much propertization is too much? That is an empirical question to which no one knows the answer.”).

70. The only occupational-licensing schemes that do not either reduce supply or raise the costs of production in a labor market are schemes that have no impact on service providers. Such licensing regimes therefore cannot cure any market defects and do not promote economic efficiency.

71. Edlin & Haw, *supra* note 29, at 1011–12 (noting that occupational licensing “can only be justified where it leads to better quality professional services”).

72. The economic effects of a requirement that lawyers perform pro bono work are less clear. See, e.g., Anne Barnard, *Top Judge Makes Free Legal Work Mandatory for Joining State Bar*, N.Y. TIMES (May 1, 2012), [http://www.nytimes.com/2012/05/02/nyregion/new-lawyers-in-new-york-to-be-required-to-do-some-work-free.html?\\_r=0](http://www.nytimes.com/2012/05/02/nyregion/new-lawyers-in-new-york-to-be-required-to-do-some-work-free.html?_r=0) (noting that New York requires bar applicants to perform 50 hours of pro bono work). In some instances, work performed for pro bono clients will be dissimilar from a lawyer’s later practice. This situation may arise with patent litigators, for example. For other lawyers, pro bono legal work may provide valuable transferrable experience. The economic analysis is further complicated by indirect effects of a pro bono requirement. For instance, pro bono work may improve the reputations of lawyers generally, and providing greater access to legal processes may have broad-ranging economic benefits for society.

73. See Shapiro, *supra* note 30, at 847 (noting that “[t]he heterogeneity of consumers in their valuation of quality is critical to a proper analysis of licensing”).

licensing, uncertified service providers can still participate in the market.<sup>74</sup> Certification can be done by a government entity or private industry, as in the case of the Better Business Bureau.<sup>75</sup> Because certification can address informational asymmetries without eliminating low-end, bargain services from the market, it often will be a less costly alternative to occupational licensing.<sup>76</sup>

### C. Simple Patent Bar Economics

It does not appear that the USPTO has ever articulated a detailed economic justification for the technical-education requirement.<sup>77</sup> For example, as described in more detail below, the General Requirements Bulletin and its precursors have never been subjected to the notice-and-comment procedures required by other federal regulations.<sup>78</sup> At best, the statutes and regulation underlying the Bulletin indicate, in a broad sense, that the requirement is intended to help parties seeking patent representation in the USPTO, that is, inventors and persons challenging the validity of issued patents. The Patent Act grants the USPTO the power to regulate patent agents and attorneys to ensure that patent practitioners possess “the necessary qualifications to render . . . *valuable service, advice, and assistance*” in the USPTO.<sup>79</sup> Likewise, USPTO regulations require that a patent practitioner “possess[] the legal, scientific, and technical qualifications necessary for him or her to render applicants *valuable service*.<sup>80</sup>

This account of the technical-education requirement is at least consistent with the first justification for occupational licensing discussed in the previous section: reducing informational asymmetries. Patent matters are both legally and factually complex, and it may be difficult for inventors to evaluate the abilities of a patent practitioner when selecting representation. The goal of helping inventors and others obtain valuable services in the USPTO also aligns with the second

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74. Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 853.

75. *Get Accredited*, BBB, <http://www.bbb.org/council/for-businesses/about-bbb-accreditation> (last visited Mar. 2, 2017).

76. Moore, *supra* note 30, at 104; Shapiro, *supra* note 30, at 853.

77. Indeed, it is difficult to determine when or why the USPTO created the technical-education requirement. It appears that the requirement was created between 1908, when the USPTO first began requiring that nonlawyers possess “legal and technical qualifications,” and 1963, when a court discussed the technical-education requirement in the Bulletin in a reported decision. *Compare U.S. PATENT OFFICE, RULES OF PRACTICE IN THE UNITED STATES PATENT OFFICE*, supp. Rule 17 (1908), *with Gager v. Ladd*, 212 F. Supp. 671 (D.D.C. 1963). The author of this Article consequently submitted a request to the USPTO for documents dated between 1908 and 1963 regarding the establishment of the technical-education requirement and the *General Requirements Bulletin*. Letter from Ricou Heaton, USPTO FOIA Officer, to William Hubbard, Assoc. Professor, Univ. of Balt. Sch. of Law (Nov. 4, 2015) (on file with the author). Although the USPTO produced 111 pages of documents in response to this request, it did not disclose any documents describing the establishment of the technical-education requirement. *See also infra* Section II.A (discussing the historical origin of the Patent Bar).

78. *See infra* Section II.B (discussing the applicability of the APA to the technical-education requirement).

79. 35 U.S.C. § 2(b)(2)(D) (2012) (emphasis added).

80. 37 C.F.R. § 11.7(a)(2)(ii) (2016) (emphasis added).

justification for occupational licensing, paternalistically protecting consumers who are unable to rationally evaluate the capabilities of patent practitioners. As noted above, such paternalism is more likely to be justified when substantial training is necessary to assess service quality and consumers use the service infrequently.<sup>81</sup> Because patent matters are both legally and technically complex, some inventors may face great difficulties in assessing service quality, particularly those inventors who obtain few patents. If inventors could cut corners by hiring cheaper, less sophisticated representation in the USPTO, they might ultimately fail to obtain valuable patents. The technical-education requirement, in theory, could prevent some inventors from being penny wise and pound foolish.

It is more difficult to justify the technical-education requirement under the third justification for occupational licensing, protecting third parties. Certainly, patents often affect third parties. Every year, the USPTO improperly issues thousands of invalid patents, and low-quality practitioners might generate low-quality patents that are particularly harmful to others. For instance, with some frequency, invalid patents are asserted against defendants in district court litigation, in part because invalidity defenses must be proven by clear and convincing evidence.<sup>82</sup> Even if an accused infringer ultimately succeeds in demonstrating that the patent is invalid, doing so requires the expenditure of substantial resources.

Although low-quality patents likely affect third parties, the USPTO probably could not justify the technical-education requirement by pointing to third-party effects. Most importantly, the third-party justification for occupational licensing cannot be squared with the explicit statutory and regulatory goals of helping inventors and others obtain “valuable services” in the USPTO.<sup>83</sup> Moreover, the use of higher-quality representation in the USPTO may exacerbate harmful third-party effects rather than ameliorate them. For instance, the use of higher-quality patent practitioners may lead to the USPTO issuing more invalid patents. When an inventor files a patent application, an examiner must grant the application unless the examiner can demonstrate that a patent should not issue.<sup>84</sup> However, overworked examiners have relatively little time to make their case against issuance. On average, examiners spend about 18 hours working on each patent application.<sup>85</sup> In contrast, patent practitioners will work for as long as

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81. Moore, *supra* note 30, at 106.

82. Microsoft Corp. v. i4i Ltd. P’ship, 561 U.S. 94, 95 (2011); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 592 (1999); Steven Yelderman, *Improving Patent Quality with Applicant Incentives*, 28 HARV. J.L. & TECH. 77, 83 (2014); see also Shubha Ghosh & Jay Kesan, *What Do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 Hous. L. Rev. 1219, 1228 (2004); Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 MINN. L. REV. 101, 113–39 (2006).

83. 35 U.S.C. § 2(b)(2)(D).

84. See *In re Brana*, 51 F.3d 1560, 1566 (Fed. Cir. 1995) (noting that the patent examiner bears the burden of demonstrating that a patent application should not issue).

85. John R. Allison & Mark A. Lemley, *The Growing Complexity of the United States Patent System*, 82 B.U. L. REV. 77, 135 (2002).

inventors continue to pay. The result is that inventors and their patent practitioners can succeed in the USPTO by wearing down patent examiners. As Judge Learned Hand observed almost a century ago: “[T]he antlike persistency of [patent] solicitors has overcome, and I suppose, will continue to overcome, the patience of examiners . . . .”<sup>86</sup> More adept patent practitioners could exacerbate this problem.

## II. A TWENTY-FIRST CENTURY VIEW OF THE PATENT BAR

The brief account in Part I might be the start of an economic justification for the technical-education requirement. The requirement might reduce informational asymmetries or paternalistically protect inventors from their own flawed decision-making. This Part demonstrates, however, that closer scrutiny reveals that the previous analysis is fatally incomplete, particularly in light of changes in patent law in recent years.

### A. *Invented Benefits of the Patent Bar*

One reason to doubt that the technical-education requirement provides significant benefits to society is that market failures regarding technical qualifications did not play a role in the Patent Bar’s legal origins.<sup>87</sup> The roots of the Patent Bar stretch to the mid-nineteenth century, when practice before the USPTO was largely unregulated.<sup>88</sup> By the 1860s, lawmakers began raising concerns that a lack of regulation had allowed unscrupulous patent agents to take advantage of unsuspecting inventors. These agents allegedly would help inventors obtain patents that were drafted with quick issuance in mind rather than effective protection for inventions.<sup>89</sup> For example, in 1859 the Commissioner of Patents asserted that “the present law affords . . . many facilities for the dishonest practices of such men, by whom innocent inventors are continually plundered.”<sup>90</sup> In response, in 1861, Congress granted the USPTO the power to ban patent practitioners from representing inventors for “gross misconduct.”<sup>91</sup> However, this high standard for misconduct produced only limited restrictions on patent agents and attorneys.<sup>92</sup> Allegations of abuses continued, including concerns regarding

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86. Lyon v. Boh, 1 F.2d 48, 50 (S.D.N.Y. 1924), *rev’d*, 10 F.2d 30 (2d Cir. 1926).

87. See Shapiro, *supra* note 30, at 851 (“Licensing is of little benefit . . . when there is little reputation problem.”); see also *supra* note 70 and accompanying text (arguing that occupational licensing should be disfavored when market failures are not clearly present).

88. Prior to 1861, both lawyers and nonlawyers could assist inventors in the USPTO. *Sperry v. Florida*, 373 U.S. 379, 388–89 (1963).

89. Kara W. Swanson, *The Emergence of the Professional Patent Practitioner*, 50 TECH. & CULTURE 519, 530 (2009).

90. U.S. PATENT OFFICE, 36TH CONG., ANNUAL REPORT OF THE COMMISSIONER OF PATENTS FOR THE YEAR 1859, at 6 (1860).

91. Act of March 2, 1861, ch. 88, 12 Stat. 246. At this time, the USPTO was known simply as the “Patent Office,” as trademark aspects of the USPTO were not added until 1881. Act of March 3, 1881, ch. 138, 21 Stat. 502. For simplicity, this Article ignores the distinction between the USPTO and the Patent Office.

92. Swanson, *supra* note 89, at 530. In one of the few cases where a practitioner was banned from representing clients in the USPTO, gross misconduct was not based on

deceptive advertising practices by nonlawyer patent agents who were “not subject to the professional restraints of their lawyer brethren.”<sup>93</sup>

As a result, in 1897, the USPTO began requiring that patent agents and attorneys register in order to be “entitled to represent applicants before the [USPTO] in the presentation and prosecution of applications for patents.”<sup>94</sup> Under this precursor to the modern Patent Bar, an attorney was automatically eligible to register with the USPTO regardless of his technical credentials so long as he was “in good standing in any court of record in the United States.”<sup>95</sup> In contrast, nonlawyers were only admitted provided they “possessed the necessary qualifications to enable [them] to render applicants for patents valuable service.”<sup>96</sup> In 1908, the USPTO further clarified that nonlawyers must possess “legal and technical qualifications.”<sup>97</sup>

At this time, the USPTO’s registration requirement lacked statutory support. In 1922, Congress corrected this deficiency by enacting § 487 of the Patent Act, which stated that the Commissioner of Patents may require that patent agents and attorneys possess “the necessary qualifications to enable them to render applicants or other persons valuable service, and are likewise competent to advise and assist applicants and other persons in the presentation or prosecution of their applications or other business before the office.”<sup>98</sup> The same year, the USPTO began requiring that every applicant to the Patent Bar “file proof that he is possessed of . . . legal and technical qualifications.”<sup>99</sup> This change, however,

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technical incompetence, but legal misconduct, namely convincing 33,000 inventors to pay for unnecessary legal services. Deborah J. Merritt, *Hypatia in the Patent Office: Women Inventors and the Law, 1865-1900*, 35 AM. J. LEGAL HIST. 235, 299 (1991).

93. Sperry v. Florida, 373 U.S. 379, 390 (1963).

94. U.S. PATENT OFFICE, OFFICIAL GAZETTE OF THE U.S. PATENT OFFICE 971, r. 17 (Aug. 17, 1897), <https://books.google.com/books?id=NGAbAQAAQAAJ&pg=PA1126&dq=patent+office+%22rules+of+practice%22+1897&hl=en&sa=X&ved=0ahUKEwi28sDW3pfSAhXBMYKHRNiAFIQ6AEILDAD#v=onepage&q=rule%2017&f=false>.

95. *Id.* at r. 17(b).

96. *Id.* at r. 17(d).

97. U.S. PATENT OFFICE, RULES OF PRACTICE IN THE UNITED STATES PATENT OFFICE 117, supp. r. 17 (1908), <https://books.google.com/books?id=cgxAAAAAYAAJ&dq=patent%20office%20%22rules%20of%20practice%22%201908&p=g=PA1#v=onepage&q=patent%20office%20%22rules%20of%20practice%22%201908&f=false>.

98. Act of February 18, 1922, ch. 58, § 3, 42 Stat. 390; *see also* Act of July 8, 1870, ch. 230, § 19, 16 Stat. 200; Act of July 4, 1884, ch. 181, § 5, 23 Stat. 101. Although the statutory provision regarding the credentials of patent agents and attorneys was recodified and amended in minor respects over the years, the modern version of the statute is largely unchanged, granting the USPTO the power to require practitioners to possess “the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance.” Section 487 was recodified in 1952 as 35 U.S.C. § 31, which in turn was reenacted as 35 U.S.C. § 2(b)(2)(D) in 1999. Consolidated Appropriations Act of 2000, Pub. L. No. 106-113, § 4715, 113 Stat 1501.

99. See U.S. PATENT OFFICE, 298 OFFICIAL GAZETTE 642–43 (1922), <https://books.google.com/books?id=atBZinlUIE8C&lpg=PA642&ots=VWxH1j55cl&dq=patent%20office%20Rules%20of%20Practice%201922&pg=PA642#v=onepage&q=patent%20office%20Rules%20of%20Practice%201922&f=false>. Eventually, the USPTO issued

erected only a minimal barrier for lawyers to join the Patent Bar, as the USPTO typically accepted as “proof” affidavits from an applicant’s supportive colleagues. Some commentators criticized this system as being “subject to the great weakness of friendship,” whereby established members of the Patent Bar would submit affidavits on behalf of an applicant merely because he was “a good fellow.”<sup>100</sup>

Consequently, in 1934, the USPTO amended its rules to require that applicants to the Patent Bar pass an entrance examination known today as the Patent Bar Exam. To be eligible to take the exam, nonlawyers were required to demonstrate that they possessed degrees in engineering or physical science or an equivalent thereto.<sup>101</sup> Lawyers, however, were automatically eligible to take the exam.<sup>102</sup> As a result, for many years, lawyers without technical degrees joined the Patent Bar, and by 1960, 22% of Patent Bar members were lawyers without technical degrees.<sup>103</sup>

Problems of insufficient technical credentials thus appear to have played little role in the establishment of the technical-education requirement, particularly as applied to attorneys.<sup>104</sup> In the absence of some market failure, occupational licensing is generally inferior to free-market forces in promoting economic efficiency.<sup>105</sup> As a cure in search for a disease, it is less likely that the requirement provides substantial economic benefits compared to the costs.

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regulations requiring that patent practitioners possess “scientific” or “technical” credentials. 37 C.F.R. § 1.17(b) (1938); *see also* 37 C.F.R. § 1.17(a) (1944) (requiring “legal and scientific qualifications”); 37 C.F.R. § 1.341(c) (1949) (requiring “legal and scientific and technical qualifications”).

100. Guerrini, *supra* note 17, at 336 (quoting Memorandum from Thomas E. Robertson to Dr. Dickinson (Aug. 2, 1933)).

101. U.S. DEP’T OF COMMERCE, PATENT OFFICE, GENERAL REQUIREMENTS FOR ADMISSION TO THE EXAMINATION FOR REGISTRATION TO PRACTICE BEFORE THE PATENT OFFICE 1 (1960) (on file with the author).

102. *Id.* Among other topics, the exam tested “an understanding of scientific and technical terminology.” *Id.* at 2.

103. *See* PATENT OFFICE ADVISORY COMM., PROPOSAL FOR CONSIDERATION AT MEETING TO BE HELD SEPTEMBER 15, 1960, at 3 (on file with the author). An examination conducted on behalf of the Commissioner of the Patent Office revealed that lawyers without technical degrees failed the Patent Bar Exam at higher rates than lawyers with technical training, but there is no evidence that the nontechnical lawyers who passed the exam and were admitted to the Patent Bar provided lower-quality patent services than technical lawyers who were admitted to the Patent Bar. U.S. PATENT OFFICE, EXAMINATION OF LAWYERS APPLYING FOR PRACTICE BEFORE THE PATENT OFFICE 11–14 (July 9, 1957) (on file with the author).

104. As described above, the public record does not disclose when or why the USPTO created the technical-education requirement. *See supra* note 77 and accompanying text; *see also infra* Section III.B (discussing the inapplicability of the APA to the technical-education requirement). Public sources are further silent regarding the USPTO’s decision to begin applying the technical-education requirement to lawyers sometime after 1960, but reported decisions indicate that the requirement applied to all applicants to the Patent Bar by 1990. *Premysler v. Lehman*, 71 F.3d 387, 389–90 (Fed. Cir. 1995).

105. *See supra* notes 68–69 and accompanying text.

***B. Licensing Benefits and Practitioner Quality***

A second reason that the technical-education requirement likely provides little economic benefit is that the correlation between patent practitioner quality and the technical-education requirement is relatively weak.<sup>106</sup> As described previously, efficient occupational licensing typically requires licensing criteria that correlate strongly with practitioner quality.<sup>107</sup> However, Patent Bar membership provides little assurance of technical competence because once a person becomes a patent agent or attorney, she is not limited to working on matters related to the technical credentials that allowed her to join. For example, a person may satisfy the technical-education requirement by demonstrating that she has a degree in biology, but thereafter is permitted to help an inventor prosecute a patent on an invention unrelated to biology, like photocopier technology.<sup>108</sup>

As a result, the benefits of the Patent Bar (if any) likely are limited. In some cases, clients can determine through other means whether technical sophistication is important and, if so, whether particular members of the Patent Bar possess it. For example, a sophisticated pharmaceutical innovator may determine that knowledge of chemistry is important to representing the company in the USPTO and accordingly hire a patent lawyer with a Ph.D. in chemistry. In such a situation, the lawyer's Patent Bar membership provided little benefit to consumers because the client selected the lawyer based on his particular educational background not merely Patent Bar membership. In other cases, clients may fail to appreciate the importance of technical sophistication and consequently hire agents or attorneys with only marginally relevant backgrounds. In these cases, Patent Bar membership again fails to provide substantial benefits to consumers.<sup>109</sup> Moreover, as described in the following subsections, many members of the Patent Bar ultimately work on matters that are minimally related to the members' technical backgrounds.

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106. See *supra* notes 71–73 and accompanying text.

107. See *supra* notes 55–57, 71–73 and accompanying text.

108. Another shortcoming of the correlation between practitioner quality and the Patent Bar may be that the USPTO does not require members of the Patent Bar to engage in any continuing professional education. Carl Schwartz, *What Patent Attorneys Should Know About New Ethics Rules*, LAW360 (May 10, 2013), <http://www.law360.com/articles/436597/what-patent-attorneys-should-know-about-new-ethics-rules>.

109. It is unlikely that a client would correctly determine that technical experience is relevant to USPTO representation and then fail to correctly identify practitioners with such a background. The costs of determining the technical backgrounds of members of the Patent Bar are generally low. For instance, determining that a patent lawyer has a degree in mechanical engineering rather than biology requires only a quick review of the lawyer's resume.

### 1. The Mismatch Between Technical Backgrounds and Patent-Eligible Subject Matter

One reason that patent agents and attorneys work with technologies falling outside of their areas of expertise is that the scope of patent-eligible subject matter is broader than the educational backgrounds recognized by the USPTO.<sup>110</sup>

This problem is illustrated most starkly by design patents, which are a type of patent that protects the invention of new ornamental, non-functional designs.<sup>111</sup> The number of inventors seeking design patent protection has exploded in recent years, more than quadrupling in the past three decades.<sup>112</sup> Despite the growing importance of design patents and although non-functional designs are largely unrelated to the engineering and science backgrounds required by the USPTO, only members of the Patent Bar can assist an inventor in prosecuting a design patent. In contrast, those with specialized training in designs, like attorneys with degrees in industrial design, are typically ineligible for Patent Bar membership.<sup>113</sup>

Likewise, patent agents and attorneys often help to prosecute functional utility patents involving technologies unrelated to the technical backgrounds supporting their Patent Bar membership. As described above, the credentials required by the USPTO were established in the mid-twentieth century and thus focus on then-extant technologies, so that today approximately 90% of Patent Bar members have backgrounds in chemical, mechanical, biological, or electrical

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110. Burke & Field, *supra* note 27, at 156–58 (discussing the admission of computer science majors to the Patent Bar); Dale L. Carlson et al., *Re-Thinking Patent Bar Admission: Which Bag of Tools Rules?*, 87 J. PAT. & TRADEMARK OFF. SOC’Y 113, 137 (2005) (discussing the disconnect between the Bulletin and the law of patent-eligible subject matter); Clifford et al., *supra* note 27, at 231–40; Corey B. Blake, Note, *Ghost of the Past: Does the USPTO’s Scientific and Technical Background Requirement Still Make Sense?*, 82 TEX. L. REV. 735, 762–65 (2004) (discussing the admission of business and design majors to the Patent Bar).

111. 35 U.S.C. § 171(a) (2012); Apple Inc. v. Samsung Elecs., Co., 786 F.3d 983, 999 (Fed. Cir. 2015), *rev’d and remanded on other grounds*, 137 S. Ct. 429 (2016) (stating that design patents cover only nonfunctional aspects of an invention). For example, Apple famously obtained a design patent protecting, *inter alia*, a “rectangular product” with “rounded corners.” *Id.* at 992.

112. The USPTO issued 5,066 design patents in 1984 and 23,657 design patents in 2014. *U.S. Patent Statistics Chart Calendar Years 1963–2014*, U.S. PAT. & TRADEMARK OFF. (June 15, 2016), [http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us\\_stat.htm](http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm).

113. 37 C.F.R. § 11.10(a) (2015) (stating that only members of the Patent Bar “are permitted to prosecute patent applications of others before the Office”). The only reference to the USPTO recognizing design credentials appears in one of the subcategories under Category B, which states that an applicant can satisfy the technical-education requirement if he or she has completed (i) 8 semester hours of chemistry or 8 semester hours of physics, and (ii) 32 semester hours of chemistry, physics, biology, botany, microbiology, molecular biology, or engineering. Of these thirty-two semester hours, “up to four semester hours will be accepted for courses in design, engineering, or drafting.” GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 6.

fields.<sup>114</sup> In marked contrast, however, the Supreme Court has staunchly refused to limit patent eligibility to these traditional technologies.<sup>115</sup> Rather, recognizing that “innovations progress in unexpected ways,” the Court has held that patent law is designed to promote invention even in new and unanticipated fields.<sup>116</sup> Because patent eligibility is not limited to traditional technologies, the credentials of members of the Patent Bar inevitably fail to align with new areas of technology that are eligible for patent protection.<sup>117</sup>

For example, many software inventions have been patent eligible since at least the mid-1980s, and today approximately 15% of the patents issued by the USPTO relate to software inventions.<sup>118</sup> Despite the growing prominence of these patents, the USPTO did not recognize computer science degrees as a qualifying technical background until the mid-1990s.<sup>119</sup> Even today, the USPTO only recognizes specially accredited computer science degrees, and only does so if the issuing university was specially accredited before the degree issued.<sup>120</sup> As a result, many computer science degrees do not qualify their recipients to join the Patent Bar. The Massachusetts Institute of Technology (“MIT”)—one of the premiere technology universities in the world—was not accredited until 1996, thus people who graduated from MIT with computer science degrees before 1996 are still ineligible today for Patent Bar membership.<sup>121</sup>

The situation is worse for business method patents. Although the USPTO issues thousands of business method patents each year, no business degrees satisfy

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114. See Clifford et al., *supra* note 27, at 229; see also *supra* note 104 (discussing the establishment of the technical-education requirement).

115. See *infra* Section II.D.3. Instead, the Court held that the only discoveries that are ineligible for patent protection are laws of nature, natural phenomena, and abstract ideas. *Id.*

116. *Bilski v. Kappos*, 561 U.S. 593, 605 (2010); see also *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (stating that denying patent protection to “inventions in areas not contemplated by Congress . . . would frustrate the purposes of the patent laws”); *Graham v. John Deere Co.*, 383 U.S. 1, 19 (1966) (noting that “the ambit of applicable art in given fields of science has widened by disciplines unheard of half a century ago”).

117. The USPTO evidently does not dispute that the technical qualifications required by the Bulletin become outdated as technology evolves. “The standards that appear in the Bulletin reflect examples of the technical requirements that are currently acceptable. These standards necessarily evolve because of changes in technology and the law.” USPTO, MEMORANDUM AND ORDER 5–6 (Apr. 30, 1994), <http://www.uspto.gov/web/offices/com/sol/foia/oed/tech/tech02.pdf>.

118. James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents*, 16 J. ECON. & MGMT. STRATEGY 157, 158, 163 (2007) (estimating that 15% of patents granted each year “[involve] a logic algorithm for processing data”); see also *Bilski*, 561 U.S. at 605 (noting that “it was once forcefully argued that . . . ‘well-established principles of patent law probably would have prevented the issuance of a valid patent on almost any conceivable computer program’”) (internal citations omitted).

119. See Burke & Field, *supra* note 27, at 150–51 (noting in 1995 that persons with computer science degrees were not eligible to join the Patent Bar). The USPTO did not hire an examiner with a degree in computer science until 1995. Scott Thurm, *A Flood of Web Patents Stirs Dispute Over Tactics*, WALL ST. J., Oct. 9, 1998, at B1.

120. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4.

121. Clifford et al., *supra* note 27, at 250–51.

the requirements of the General Requirements Bulletin.<sup>122</sup> Though some patent practitioners may happen to have business degrees in addition to their traditional technical backgrounds, most of the patent agents and attorneys who prosecute business-method patents likely do not possess substantial training in business.<sup>123</sup>

## 2. *Entrepreneurial Patent Practitioners*

Market forces also encourage patent agents and attorneys to look beyond their particular technical training when representing parties in the USPTO. Like many businesses, patent practitioners may not be able to afford to be selective in accepting clients. For example, a patent agent with a mechanical engineering degree may prefer to assist an inventor who has discovered a new chemical compound rather than to refer the inventor to another patent practitioner with a degree in chemistry or chemical engineering. Although USPTO regulations provide a code of ethics applicable to members, these regulations do not prevent a patent practitioner from working on a patent matter involving unfamiliar technologies if the practitioner delivers adequate service to the client.<sup>124</sup> The patent practitioner may simply need to spend additional time familiarizing herself with the technology or enlist the help of someone more familiar with the technology, perhaps even the inventor.

In some cases, where a patent agent or attorney works on a matter involving technology that is distinct from his or her undergraduate degree, he or she may nevertheless be utilizing portions of his or her education that are shared by many science and engineering disciplines. For instance, students may take introductory courses in physics while pursuing degrees in chemistry, aeronautical engineering, civil engineering, electrical engineering, mechanical engineering, chemical engineering, or industrial engineering. Accordingly, some portion of a chemical engineer's education may be relevant to working on a patent matter involving a mechanical invention.<sup>125</sup> In such situations, the patent practitioner's technical background may not be irrelevant to the invention, but it also provides less benefit. Furthermore, if the benefit of the technical-education requirement is to assure that practitioners possess the limited technical training common to many engineering and science programs, then the social costs associated with the Patent Bar are higher than necessary because many people with that minimal training are

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122. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4–5; *see, e.g.*, Maresca v. Comm'r of Patents & Trademarks, 871 F. Supp. 504, 507 (D.D.C. 1994), *aff'd*, 56 F.3d 80 (Fed. Cir. 1995) (affirming the USPTO's rejection of an application to take the Patent Bar Exam because the applicant had a degree in Business Administration).

123. Clifford et al., *supra* note 27, at 257 (reporting that only 2.546% of patent practitioners have business degrees).

124. 37 C.F.R. § 10.77 (2005); *see infra* notes 233–34 and accompanying text (discussing the ethical obligations of members of the Patent Bar).

125. Indeed, the overlap between different technical fields may explain why the USPTO allows a person to take the Patent Bar exam under Category B option 4, which provides that a person is Patent Bar eligible if she has taken “40 semester hours in a combination consisting of the following: 8 semester hours of chemistry or 8 semester hours of physics, and 32 semester hours of chemistry, physics, biology, botany, microbiology, molecular biology, or engineering.” GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 5.

ineligible to join the Patent Bar due to the more rigorous standards of today's Bulletin.<sup>126</sup>

### C. Licensing Benefits and Inventor Sophistication

A third reason that the technical-education requirement is unlikely to provide substantial social benefits is that efficient occupational licensing typically arises when consumers lack the sophistication to effectively evaluate the credentials of service providers.<sup>127</sup> Today, however, inventors as a group are more sophisticated than ever before, at least insofar as the percentage of U.S. patents issuing to independent inventors has steadily decreased.<sup>128</sup> For example, in 1991 approximately 20% of patents issued to individual inventors, while the remaining 80% issued to corporations, businesses, universities, and non-profit institutions.<sup>129</sup> By 2014, the percentage of patents issued to individual inventors dropped to only 6%.<sup>130</sup> All other things being equal, institutional-patent recipients are more likely to be sophisticated consumers of patent-practitioner services than individual inventors. Businesses and universities often have savvy in-house counsel and frequently are repeat players in the USPTO.<sup>131</sup> Moreover, institutional patent recipients are more likely to have non-patent counsel that can assist in the selection of an effective patent practitioner.

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126. Unfortunately, it is difficult to quantify the extent that the technical backgrounds of patent practitioners are unrelated to the patents they prosecute because an invention may involve many different technologies, so that a patent practitioner's background may be relevant to some but not all aspects of the technology. For example, a medical device may involve mechanical, electrical, and chemical technologies, so that many undergraduate degrees could be relevant to a medical device patent, including mechanical engineering, electrical engineering, and chemistry.

127. See *supra* note 70 and accompanying text (arguing that occupational licensing should be disfavored when market failures are not clearly present).

128. Typically, a patent application must be filed by the inventor. 35 U.S.C. § 111(a)(1) (2012); 37 C.F.R. § 1.41(a) (2015). In addition, an inventor must submit with a patent application an oath stating that the inventor "believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application." 35 U.S.C. § 115(b)(2) (2012). However, "[a] person to whom the inventor has assigned or is under an obligation to assign the invention may make an application for patent." *Id.* § 118. Moreover, an inventor can assign ownership of a patent during the pendency of an application. *Id.* § 261.

129. Richard S. Gruner, *Corporate Patents: Optimizing Organizational Responses to Innovation Opportunities and Invention Discoveries*, 10 MARQ. INTELL. PROP. L. REV. 1, 7 (2006).

130. See USPTO, ALL TECHNOLOGIES REPORT JANUARY 1991 – DECEMBER 2015, at A1-1 (March 2016), [http://www.uspto.gov/web/offices/ac/ido/oeip/taf/all\\_tech.pdf](http://www.uspto.gov/web/offices/ac/ido/oeip/taf/all_tech.pdf). Most institutional patent recipients are corporations. See *id.* According to some patent law scholars, the inventive contribution of independent inventors are "frequently hyped and distorted." JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* 166 (2008).

131. In addition, businesses are less likely to need paternalistic intervention. Competition between businesses causes them to be more rationally self-interested. See Hubbard, *supra* note 59, at 2066–70 (discussing the effect of competition on rational decision-making).

The vast majority of patent recipients are thus sophisticated actors who are less likely to benefit from informational or paternalistic benefits from the technical-education requirement. Independent inventors might benefit more, but they account for an exceedingly small portion of patents each year. In fact, the reduced role of independent inventors may stem, in part, from the restrictive nature of the Patent Bar and the resulting high costs of obtaining the services of a patent agent or attorney. Rather than assuring independent inventors that their patent practitioners are more qualified, the technical-education requirement may prevent some independent inventors from obtaining any patent representation at all.<sup>132</sup>

#### **D. Licensing Costs and Legal Expertise**

A fourth reason that the technical-education requirement is difficult to justify economically is that the requirement raises the costs of obtaining patent representation in the USPTO by limiting the pool of practitioners who possess an increasingly valuable credential: legal sophistication. As described above, occupational licensing often raises costs for customers to obtain services because only service providers who have invested in obtaining the required credentials will be able to provide the services.<sup>133</sup> Consequently, patent practitioners with legal expertise are doubly expensive to hire because relatively few people possess both legal and technical credentials.<sup>134</sup> The result is that patent-attorney billing rates are generally higher than those of agents and many non-Patent-Bar-member lawyers.<sup>135</sup> Some inventors and potential infringers may not be able to afford these more expensive services and therefore may not pursue certain matters in the USPTO.<sup>136</sup> Indeed, the Patent Bar may further exacerbate problems stemming from insufficient legal sophistication because it suggests that patent agents without legal training are nevertheless capable of handling legally complex issues in the USPTO.<sup>137</sup> Inventors may be particularly susceptible to problems of legal unsophistication because, although inventors are often technically astute, they typically lack legal training.<sup>138</sup>

In the past, limiting the pool of lawyers who could represent inventors in the USPTO may not have substantially raised costs because legal skills may not

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132. Some independent inventors may be electing trade secret protection in lieu of patent protection, but these two forms of intellectual property are not perfect substitutes. See Hubbard, *supra* note 1, at 1959.

133. See *supra* notes 65–68 and accompanying text.

134. See *infra* note 135 and accompanying text.

135. AIPLA 2013, *supra* note 3, at I-8; see *supra* notes 14–15 and accompanying text (discussing median salaries for patent agents, non-patent lawyers, and patent attorneys).

136. Shapiro, *supra* note 30, at 844.

137. “Poorly designed licensing laws may injure consumers by providing a false assurance of quality.” Ribstein, *supra* note 55, at 306.

138. See *supra* notes 50–53 and accompanying text (noting that informational asymmetries are more likely when expertise is required to evaluate service quality); see also *supra* note 60 (stating that paternalistic occupational licensing is more likely justified when expertise is needed to evaluate service quality). Independent inventors are particularly less likely to be legally sophisticated. Most patents today, however, issue to corporations, which are more likely to be more legally sophisticated. See *supra* Section II.C (discussing the increasing sophistication of patent owners).

have been important to effectively assist inventors. In the early twentieth century, some commentators asserted that “knowledge of the invention is more important than knowledge of [patent law].”<sup>139</sup> Indeed, a law degree has never been a requirement to represent inventors in the USPTO, and for many inventors, patent agents provide a cheaper alternative to patent attorneys.<sup>140</sup> Others in the past have disagreed, asserting that the resolution of legal issues was central to the work of patent agents and attorneys.<sup>141</sup> For example, the Supreme Court asserted in 1892 that a patent application is “one of the most difficult legal instruments to [draft] with accuracy.”<sup>142</sup> Likewise, in 1963, the Court confirmed that “the preparation and prosecution of patent applications for others constitutes the practice of law.”<sup>143</sup>

Regardless of whether the work of patent practitioners historically was more technical or legal, today, legal expertise has become particularly important. Now, innovators seeking representation in the USPTO often need both legal and technical expertise. The following subsections detail some aspects of patent law that recently have become more legally complex.

### *1. Patent Challenges in the USPTO*

One important aspect of the work of patent agents and attorneys that has changed in recent years is the extent to which members of the Patent Bar are involved in post-grant litigation in the USPTO. When the technical-education requirement was established in the mid-twentieth century, all challenges to patent validity took place through district court litigation.<sup>144</sup> Unfortunately, district court patent litigation was enormously expensive and time consuming—as it still is today.<sup>145</sup> As a result, for more than 30 years, Congress has sought to shift validity disputes from the district courts to administrative adjudications in the USPTO where Congress hopes that fights are cheaper and faster. As described below, these efforts appear to be succeeding as litigants are bringing increasing numbers of validity actions in the USPTO. In these proceedings, members of the Patent Bar perform work akin to patent litigation, which is legally intricate and has never required a technical education.

Congress established the first administrative alternatives to district court litigation in 1980 in the form of “reexamination” proceedings.<sup>146</sup> These ex parte proceedings were designed to allow the USPTO to quickly and cheaply correct

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139. COMM’R OF PATENTS, ANNUAL REPORT, at xiv (1915), <http://library.si.edu/digital-library/book/annualreportofc1915unit>.

140. 37 C.F.R. § 11.6(b) (2012).

141. WILLARD PHILLIPS, THE LAW OF PATENTS FOR INVENTIONS; INCLUDING THE REMEDIES AND LEGAL PROCEEDINGS IN RELATION TO PATENT RIGHTS 232 (1837); Swanson, *supra* note 89, at 534–35.

142. Topliff v. Topliff, 145 U.S. 156, 171 (1892).

143. Sperry v. Florida, 373 U.S. 379, 383 (1963).

144. See *supra* note 104 (establishing that the technical-education requirement was established between 1908 and 1963 in regards to patent agents).

145. Gregory Dolin, *Dubious Patent Reform*, 56 B.C. L. REV. 881, 890–95 (2015).

146. Act of December 12, 1980 (Bayh-Dole Act), Pub. L. No. 96-517, ch. 30, 94 Stat. 3015 (1980).

mistakes made in the initial examination of a patent application.<sup>147</sup> More specifically, in a reexamination, the USPTO would consider a “substantial new question of patentability,” though the USPTO could not consider certain validity challenges, like a claim that the subject matter of a discovery is ineligible for patent protection.<sup>148</sup>

Although the USPTO has granted more than 11,000 requests for reexamination since 1981, experts have perceived reexamination procedures as underutilized.<sup>149</sup> Congress hoped that the USPTO would reexamine several thousand patents each year, but in actuality, the Office on average reexamined only several hundred.<sup>150</sup> One explanation for the shortfall was the ex parte nature of reexamination.<sup>151</sup> Although anyone could request that the USPTO initiate a reexamination, once the proceedings had begun, they were conducted like a normal patent-application examination. As a result, even a third party that successfully requested a reexamination could not participate in the subsequent proceedings.<sup>152</sup>

In 1999, Congress responded to this concern by creating a new *inter partes* version of reexamination proceedings.<sup>153</sup> Initially, these actions were seldom used because they were only available for patents filed in 1999 or later.<sup>154</sup> Soon, however, the USPTO began granting an increasing number of requests for *inter partes* reexaminations. In 2012 alone, the USPTO initiated more than 500 *inter partes* reexaminations.<sup>155</sup>

In some respects, *inter partes* reexamination provided a more favorable avenue for challenging patents than district court litigation. To start, in district court litigation patents are presumed valid, and any invalidity claim must be supported by clear and convincing evidence.<sup>156</sup> In contrast, a patent challenger in an *inter partes* reexamination needed only to prove invalidity by a preponderance

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147. *Id.*; see also H.R. REP. NO. 96-1307, pt. 1, at 3–4 (1980), as reprinted in 1980 U.S.C.C.A.N. 6460, 6463 (“Reexamination will permit efficient resolution of questions about the validity of issued patents without recourse to expensive and lengthy infringement litigation.”).

148. See 35 U.S.C. § 303 (2012); *infra* Section II.D.3 (discussing patent-eligible subject matter).

149. USPTO, EX PARTE REEXAMINATION FILING DATA 1 (Sept. 30, 2016), [https://www.uspto.gov/sites/default/files/documents/ex\\_parte\\_historical\\_stats\\_roll\\_up.pdf](https://www.uspto.gov/sites/default/files/documents/ex_parte_historical_stats_roll_up.pdf); Dolin, *supra* note 145, at 895–96.

150. See USPTO, EX PARTE REEXAMINATION FILING DATA, *supra* note 149; Dolin, *supra* note 145, at 895–96.

151. Dolin, *supra* note 145, at 902–09.

152. USPTO, REPORT TO CONGRESS ON INTER PARTES REEXAMINATION 2 (2004), <https://www.uspto.gov/web/offices/dcom/olia/reports/reexamreport.pdf>.

153. American Inventors Protection Act of 1999, Pub. L. No. 106-113, 113 Stat. 1501 (codified in relevant part in 35 U.S.C. §§ 311–318 (2006) and repealed in 2012).

154. *Id.* § 4608.

155. USPTO, INTER PARTES REEXAMINATION HISTORICAL STATISTICS 3 (Sept. 30, 2013), [http://www.uspto.gov/patents/stats/inter\\_parte\\_historical\\_stats\\_roll\\_up\\_EOY2013.pdf](http://www.uspto.gov/patents/stats/inter_parte_historical_stats_roll_up_EOY2013.pdf).

156. See Microsoft Corp. v. i4i Ltd. P’ship, 564 U.S. 91, 95 (2011).

of the evidence.<sup>157</sup> Moreover, patents received broader constructions in reexaminations than in district court litigation. In district court litigation, the scope of a patent is determined by considering the perspective of a person of ordinary skill in the art, while in a reexamination proceeding the validity of a patent is evaluated based on the *broadest* reasonable interpretation of the patent.<sup>158</sup> *Ceteris peribus*, broader patents are more likely to be invalid.<sup>159</sup>

Despite these advantages for patent challengers, litigants rarely considered *inter partes* reexamination to be an attractive alternative to district court litigation. One reason for this underutilization was that an accused defendant in a pending district court lawsuit could not use *inter partes* reexamination to shorten or prevent district court litigation: a party that initiated an *inter partes* reexamination was not entitled to stay a parallel lawsuit.<sup>160</sup> In theory, an accused infringer could use a reexamination to invalidate a patent and thus render the parallel district court litigation moot, but this outcome was unlikely for two reasons. First, when reexaminations and lawsuits took place concurrently, the reexamination was unlikely to conclude first, as the average duration for a reexamination was about three years and most patent lawsuits in the district courts reached the trial stage in only two-and-a-half years.<sup>161</sup> Second, because some invalidity defenses could not be raised in reexaminations, alleged infringers were often forced to pursue parallel litigation through district courts.<sup>162</sup> In many cases, potential infringers of patents thus used reexaminations as a supplement for district court litigation, not a substitute.<sup>163</sup> Patent owners likewise had little reason to

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157. *In re Swanson*, 540 F.3d 1368, 1377 (Fed. Cir. 2008).

158. *Id.* at 1377–78.

159. Dolin, *supra* note 145, at 916 (noting that broader patents are more likely to be invalid).

160. *Procter & Gamble Co. v. Kraft Foods Global, Inc.*, 549 F.3d 842, 848–49 (Fed. Cir. 2008) (stating that district courts have discretion as to whether to stay a suit in light of an *inter partes* reexamination). Stays of litigation pending the outcome of a reexamination, however, were not uncommon.

161. Compare USPTO, INTER PARTES REEXAMINATION HISTORICAL STATISTICS (2013), [http://www.uspto.gov/patents/stats/inter\\_parte\\_historical\\_stats\\_roll\\_up\\_EOY2013.pdf](http://www.uspto.gov/patents/stats/inter_parte_historical_stats_roll_up_EOY2013.pdf) (stating that the average duration of an *inter partes* reexamination was thirty-six months), with PRICEWATERHOUSECOOPERS LLP, 2011 PATENT LITIGATION STUDY: PATENT LITIGATION TRENDS AS THE “AMERICA INVENTS ACT” BECOMES LAW 27–28 (2011), <http://www.aipla.org/resources2/intlip/Documents/Other-International-Events/US-Bar-JPO-Liaison-Council-2012/2011-patent-litigation-study.pdf> (reporting that the median time-to-trial for patent lawsuits is two-and-a-half years).

162. See *supra* note 148 and accompanying text; see also *infra* notes 173–175 and accompanying text (describing limitations on the invalidity arguments that could be raised in reexaminations).

163. See *Bettcher Indus. v. Bunzi USA, Inc.*, 661 F.3d 629, 647 (Fed. Cir. 2011) (stating that “Congress intended that reexaminations and civil patent litigation could occur in parallel . . . .”). In an effort to reduce the extent that arguments in reexaminations were repeated in district court litigation, Congress provided that a party that initiates an *inter partes* reexamination was estopped from asserting “at any time, in any civil action arising in whole or in part . . . the invalidity of any [patent] claim finally determined to be valid and patentable on any ground which the third party requester raised or could have raised during the *inter partes* reexamination proceedings.” 35 U.S.C. § 315(c) (2012). This estoppel does

prefer *inter partes* reexamination over litigation. While a patent owner was authorized by statute to obtain a stay of a district court suit pending the outcome of an *inter partes* reexamination,<sup>164</sup> the patent owner typically would prefer district court litigation given the more patent friendly validity standards of that forum.

In an effort to make administrative proceedings in the USPTO more-attractive alternatives to district court litigation, in 2011 Congress replaced *inter partes* reexamination with three new administrative proceedings for challenging the validity of issued patents: post-grant review, *inter partes* review, and covered business method review.<sup>165</sup> The contexts in which these different proceedings can be initiated depend on the technology covered by patents and the dates that patents issued. Covered business method reviews apply only to business method patents and can be initiated at any time during such a patent's life, though the patent laws supporting covered business method review are set to expire in 2020.<sup>166</sup> Post-grant reviews are not limited to a particular type of technology but must be initiated within nine months of a patent's issuance.<sup>167</sup> Any later challenges must be brought through an *inter partes* review.<sup>168</sup>

All of the new proceedings preserve the features of reexamination favoring invalidity challenges. Patents are evaluated using the "broadest reasonable construction," and invalidity must be proven only by a preponderance of the evidence rather than the clear-and-convincing standard applicable in district court litigation.<sup>169</sup> Procedural aspects of the new proceedings, however, are markedly different from *inter partes* reexaminations. For the most part, reexaminations were conducted using the same procedures used by the USPTO

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not attach, however, until all of the appeals rights related to a reexamination have been exhausted, including the appeal of a reexamination within the USPTO and later to the Federal Circuit Court of Appeals, which is a process that can take many years. *Bettcher Indus.*, 661 F.3d at 642–48. As a result, the estoppel that could arise from *inter partes* reexaminations often had little impact on district court litigation.

164. See 35 U.S.C. § 318 (2006) (amended 2012).

165. Leahy-Smith America Invents Act, Pub. L. No. 112-29, §§ 6, 18, 125 Stat. 284 (2011). This Article highlights some of the relevant differences between *inter partes* reexamination and the administrative procedures created by Congress in 2011, but a full description of these differences is beyond the scope of this Article.

166. *Id.* § 18(a)(1)(A); 35 U.S.C. § 321(c) (2012). Covered business method reviews can only be initiated by a party that "has been sued for infringement of the patent or has been charged with infringement under that patent." Unlike with post-grant review and *inter partes* review, Congress did not describe the features of covered business reviews in separate statutory sections. Instead, Congress established covered business method review as a "transitional" program and stated that covered business method reviews "shall employ the standards and procedures of, a postgrant review." Pub. L. No. 112-29, § 18(a)(1).

167. 35 U.S.C. § 321(c).

168. *Id.* § 311(c) (2012).

169. *Id.* §§ 316(e), 326(e) (2012); 37 C.F.R. §§ 42.100(b), 42.200(b) (2017); see *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1277 (Fed. Cir. 2015). For patents that are set to expire before the conclusion of a post-grant review, the USPTO does not apply the broadest reasonable construction and instead applies a claim construction process akin to that used in district court litigation. See 37 C.F.R. §§ 42.100(b), 42.200(b), 42.300(b).

when reviewing a patent application.<sup>170</sup> For example, while a party in an *inter partes* reexamination could submit fact witness and expert affidavits, discovery was not allowed.<sup>171</sup> In contrast, the new administrative proceedings are “adjudicatory in nature and [constitute] litigation.”<sup>172</sup> Because Congress sought to provide a cheaper alternative to district court litigation, parties are allowed limited discovery in the new administrative procedures.<sup>173</sup>

Moreover, the new procedures expand the grounds that can be considered for invalidating a patent. *Inter partes* reexamination procedures were limited to “substantial new questions of patentability,” thus prohibiting a potential infringer from raising a validity issue that the USPTO considered in the initial examination that produced the patent.<sup>174</sup> The new administrative procedures eliminate this limitation, thereby allowing adversarial exploration of validity issues that had only been considered ex parte by an initial patent examiner.<sup>175</sup> The older reexamination procedures were also restricted to claims that a patent was invalid because it was identical to or only trivially different from other patents or printed publications.<sup>176</sup> With both post-grant review and covered business method review, however, patent challengers can now assert any invalidity critique that could be made in federal court.<sup>177</sup>

Perhaps even more importantly, a potential infringer can effectively forestall district court litigation by initiating one of the new administrative proceedings because these proceedings are required to conclude in most cases within one year, with a maximum extension of six months for “good cause.”<sup>178</sup> As a result, even if the administrative proceeding occurs in parallel with district court

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170. 35 U.S.C. § 314(a) (2012); 37 C.F.R. § 1.937(b) (2017); *see also* STERNE, KESSLER, GOLDSTEIN, & FOX, P.L.L.C., PATENT OFFICE LITIGATION 188 (Robert Greene Sterne et al., eds., 2012) (noting that reexaminations were “essentially examinational in nature”).

171. *See* 37 C.F.R. § 1.132 (2017).

172. Google Inc. v. Jongerius Panoramic Techs., LLC, No. IPR 2013-00191, at 4 (P.T.A.B. Feb. 13, 2014), <http://patentdocs.typepad.com/files/246134.pdf>; Idle Free Sys., Inc. v. Bergstrom, Inc., No IPR 2012-0027, at 6 (P.T.A.B. June 11, 2013) (“An inter partes review is more adjudicatory than examinational[] in nature.”).

173. In post-grant reviews and covered business method reviews, discovery is “limited to evidence directly related to factual assertions advanced by either party in the proceeding.” 35 U.S.C. § 326(a)(5) (2012). In *inter partes* review, discovery is limited to “relevant evidence,” though only witnesses who submit affidavits or declarations can be deposed. *Id.* § 316(a)(5) (2012); *see also* 37 C.F.R. § 42.51 (2017) (describing the discovery allowed and required in trials before the Patent Trial and Appeal Board).

174. 35 U.S.C. § 312 (2008) (amended 2011); *In re NTP, Inc.*, 654 F.3d 1268, 1275 (Fed. Cir. 2011).

175. 35 U.S.C. § 321(b) (2012). In fact, 69% of recent petitions to initiate *inter partes* review are based at least in part on prior art that was already considered by the patent examiner in the initial examination of the patent. Dolin, *supra* note 145, at 928.

176. 35 U.S.C. §§ 311–12 (2012) (current version at 35 U.S.C. §§ 311–12 (2013)).

177. *See* 35 U.S.C. § 321(b); *see also* Leahy-Smith America Invents Act, Pub. L. No. 112-29, §18(a)(1), 125 Stat. 284 (2011).

178. 35 U.S.C. §§ 316(a)(11), 326(a)(11) (2012).

litigation, the proceeding in the USPTO will usually conclude well before the district court litigation.<sup>179</sup>

Early measures of utilization are still emerging because *inter partes* review has only been available since September 2012, and post-grant review and covered business method review can only apply to patents filed after March 2013.<sup>180</sup> Nevertheless, by all accounts, it appears that litigants are utilizing the new USPTO procedures in substantially greater numbers than *inter partes* reexamination. At its peak, the USPTO initiated 530 *inter partes* reexaminations per year.<sup>181</sup> In 2015, the USPTO instituted more than 1,300 post-grant reviews, covered business method reviews, and *inter partes* reviews combined.<sup>182</sup>

Inventors and potential infringers will also need to be advised regarding the complex interplay between patent challenges in the USPTO, suits in the district courts, and International Trade Commission investigations. For example, by statute, a party cannot initiate any of the new USPTO procedures if it has already initiated a lawsuit in district court challenging the validity of the patent.<sup>183</sup> Moreover, if a party challenges the validity of a patent through administrative proceedings in the USPTO, and that challenge produces an initial decision, then that party will be barred from raising invalidity claims that it “raised or reasonably could have raised” in the USPTO litigation in parallel district court litigation or related International Trade Commission investigations.<sup>184</sup> Additionally, in some cases, administrative proceedings will proceed in parallel with district court litigation regarding the same patents, so that the same legal issues arise in the USPTO and the courts.<sup>185</sup>

As a result, an increasing number of patent practitioners will be asked to provide legal advice regarding proceedings simultaneously in the USPTO, the International Trade Commission, and district courts. Importantly, in all of these new administrative proceedings, the USPTO requires that lead counsel in proceedings be a member of the Patent Bar.<sup>186</sup> Additional attorneys who are not

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179. See *infra* note 185 and accompanying text.

180. Leahy-Smith America Invents Act, Pub. L. No. 112-29, §§ 6(c)(2)(A), 6(f)(2)(A), 18, 125 Stat. 284 (2011).

181. USPTO, INTER PARTES REEXAMINATION HISTORICAL STATISTICS 1 (Sept. 30, 2013), [http://www.uspto.gov/patents/stats/inter\\_parte\\_historical\\_stats\\_roll\\_up\\_EOY2013.pdf](http://www.uspto.gov/patents/stats/inter_parte_historical_stats_roll_up_EOY2013.pdf).

182. USPTO, PATENT TRIAL AND APPEAL BOARD STATISTICS 3 (Dec. 31, 2015), <http://www.uspto.gov/sites/default/files/documents/2015-12-31%20PTAB.pdf>.

183. 35 U.S.C. §§ 315(a)(1), 325(a)(1) (2012).

184. *Id.* §§ 315(e)(2), 325(e)(2).

185. In some cases, administrative proceedings cannot proceed in parallel with district court litigation. For example, if a patent challenger initiates an *inter partes* review and thereafter files a civil action in district court challenging the validity of the patent, the civil action will be automatically stayed until the patent owner moves to lift the stay or files a civil action asserting infringement. 35 U.S.C. § 315(a)(2). Similarly, a patent challenger cannot initiate an *inter partes* review if he or she has already filed a civil action seeking to invalidate a patent or has waited more than a year since the start of an infringement suit by the patent owner. *Id.*

186. 37 C.F.R. § 42.10(a), (c) (2017).

members of the Patent Bar can be admitted pro hac vice, but lead counsel must be present for much of the proceedings.<sup>187</sup> Thus, increasing numbers of patent practitioners will be involved in USPTO adjudications involving complex legal issues, including issues of procedure, evidence, substantive patent law, and litigation strategy.<sup>188</sup>

## 2. *Obviousness*

Much of the work of patent agents and attorneys in the USPTO centers on patent prosecution, including drafting patent applications, responding to patent examiners' rejections and critiques, and amending applications. Although this process has always involved both technical and legal issues, patent agents and attorneys today must apply more sophisticated legal analyses to patent prosecution than was required in the past.

For example, the U.S. Supreme Court has rendered more complex the law related to a core feature of patent law known as "obviousness."<sup>189</sup> In order for an inventor to obtain a patent, he or she must show that the invention not only is new, but also is not an "obvious" variation of "prior art," that is, existing technologies.<sup>190</sup> The obviousness requirement is perhaps the biggest hurdle inventors' face to obtaining patent rights. Indeed, it is the most common basis for invalidating issued patents.<sup>191</sup>

Oftentimes, a new invention can be conceptualized as a combination of multiple prior art references in that every feature of the invention appears in a known source though no single prior art reference discloses the entire invention. Sometimes, such a combination is trivial, as in the case where a manufacturer simply alters existing technology to include an equivalent but distinct material. For example, the first person to develop a porcelain doorknob was unable to obtain a patent in light of existing metal doorknob technology and the well-known similarities between metal and porcelain.<sup>192</sup> Other times, however, a particular hybridization of known technologies is the product of great insight and

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187. *Id.*; Synopsys, Inc. v. Mentor Graphics Corp., No. IPR 2012-00042, at 2 (P.T.A.B. Oct. 31, 2013) ("The Board expects lead counsel for each party to be present at hearing, although any backup counsel may make the actual presentation, in whole or in part."); *see, e.g.*, Google Inc. v. Jongerius Panoramic Techs., LLC, No. IPR2013-00191, at 5 (P.T.A.B. Feb. 13, 2014) (granting a motion in an *inter partes* review to admit pro hac vice an attorney who is not a member of the Patent Bar); *see also* 37 C.F.R. § 42.2 (2017) (defining "trial" in the USPTO). Although individuals who are parties to administrative proceedings in the USPTO can proceed pro se, corporations must be represented by counsel. 37 C.F.R. § 1.31 (2017).

188. 37 C.F.R. § 42.10(c) (2017).

189. KSR Int'l v. Teleflex, Inc., 550 U.S. 398 (2007).

190. 35 U.S.C. § 103 (2012); *see also id.* § 102 (2012) (defining prior art).

191. John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AM. INTELL. PROP. L.Q. 185, 192 (1998).

192. Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1851).

inspiration.<sup>193</sup> Distinguishing between obvious and nonobvious combinations of prior art references is particularly difficult due to hindsight bias, that is, the natural tendency to underestimate the difficulty of correct decision-making once an answer is already known.<sup>194</sup>

In light of these challenges, for many years courts considered combinations of prior art references to be nonobvious unless some prior art reference provided a particular “teaching, suggestion, or motivation” to combine the two existing technologies (“TSM” for short).<sup>195</sup> Thus, a patent agent or attorney facing an obviousness rejection from a patent examiner based on a combination of prior art references could relatively easily overcome the rejection by insisting that the examiner provide prior art showing TSM to combine the references.<sup>196</sup> Without such a TSM roadmap, the examiner’s obviousness rejection would fail.

In 2007 in *KSR International v. Teleflex, Inc.*, however, the Supreme Court rejected the bright-line certainty of the TSM test in favor of “an expansive and flexible approach.”<sup>197</sup> While the Court agreed that combinations of prior art references supported by TSM are obvious, the Court also held that additional combinations of known technologies might nonetheless be obvious, including combinations requiring only “ordinary creativity” and combinations that are “obvious to try.”<sup>198</sup> Patent practitioners facing obviousness rejections today thus must grapple with the *KSR* decision and its progeny rather than simply relying on TSM.

The Supreme Court’s expanded test for obviousness compounded additional legal complexities. Even before *KSR*, a prior art reference could only be used for an obviousness challenge if it was considered “analogous” to the invention in that the reference either came from the same “field of endeavor”<sup>199</sup> as the invention or was “reasonably pertinent to the problem addressed by [the invention].”<sup>200</sup> While “field of endeavor” and “reasonably pertinent” have always been open-textured concepts, the TSM requirement tempered any vagueness. Typically, there are few teachings, suggestions, or motivations to combine

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193. *E.g.*, *United States v. Adams*, 383 U.S. 39 (1966) (holding that the design of a battery was not obvious even though the battery used both electrodes and electrolytes found in the prior art).

194. *KSR Int’l*, 550 U.S. at 421. See generally Gregory Mandel, *Patently Non-Obvious: Empirical Demonstration that the Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391, 1394 (2006) (arguing that hindsight bias affects obviousness determinations).

195. *KSR Int’l*, 550 U.S. at 399.

196. See *In re Brana*, 51 F.3d 1560, 1566 (Fed. Cir. 1995) (noting that the patent examiner bears the burden of demonstrating that a patent application should not issue).

197. 550 U.S. at 415; see also Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557 (1992) (discussing the cost/benefit differences between rules and standards).

198. A complete analysis of the ramifications of the *KSR* decision is beyond the scope of this Article.

199. *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1380 (Fed. Cir. 2007).

200. *Id.* at 1379.

technologies from disparate “fields of endeavor” or technologies that were not “reasonably pertinent to the problem” addressed by the invention. After *KSR*, however, patent prosecutors can no longer rely on TSM to cabin the scope of analogous technologies and instead must engage directly with the law regarding “field of endeavor” and “reasonable pertinen[ce].”

### 3. Patent-Eligible Subject Matter

A third area where patent agents and attorneys must apply more nuanced legal analyses than in the past is in determining whether an invention is the type of discovery that is eligible for patent protection. The U.S. Supreme Court has long held that patent protection is unavailable for three types of discoveries: laws of nature, natural phenomena, and abstract ideas.<sup>201</sup> The Court has eschewed expanding the list of categories that are excluded from patent protection, holding, for instance, that living creatures and business methods are eligible for patent protection.<sup>202</sup>

The scope of the three categorical exclusions from patent eligibility is legally complex. For example, while it may be clear that a general mathematical principle like addition is an abstract idea, it is less clear whether particular uses of mathematical principles are abstract ideas, such as the financial concepts of hedging or intermediated settlement.<sup>203</sup> A further challenge in defining the scope of the three categorical exclusions is that patent-ineligible subject matter underlies all inventions: “At some level, ‘all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.’<sup>204</sup> For instance, traditional machines like the cotton gin are ultimately based on laws of nature, like friction, momentum, and leverage. Similarly, each step in a detailed software algorithm involves abstract ideas like addition, subtractions, multiplication, and division. Some inventions may differ only trivially from ineligible subject matter and accordingly should, themselves, be ineligible for patent protection, while other inventions are sufficiently different from the excluded categories that they should be eligible for patent protection. Unfortunately, the difference between trivial and substantive applications of ineligible subject matter is a matter of degree and thus difficult to consistently identify.

The Supreme Court has addressed the law of patent-eligible subject matter in four separate cases since 2010.<sup>205</sup> The Court’s treatment of these concepts, however, involves nuanced legal analysis. For example, in *Bilski v. Kappos*, the Court declined to hold that business methods are per se patent ineligible, instead holding that only business methods that happen to fall in the categorical exclusions should be ineligible for patent protection. Rather than

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201. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

202. *Bilski v. Kappos*, 561 U.S. 593, 609 (2010); *Diamond*, 447 U.S. at 306.

203. The Supreme Court held that both are abstract ideas. See *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014) (intermediated settlement); *Bilski*, 561 U.S. at 609 (hedging).

204. *Alice Corp.*, 134 S. Ct. at 2354.

205. *Id.* at 2357; *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012); *Bilski*, 561 U.S. at 593.

adopting an easy-to-apply, bright-line rule, the Court directed litigants to identify patent-ineligible business methods by applying other Supreme Court decisions, stating that “[t]he Court...need not define further what constitutes a patentable ‘process,’ beyond pointing to the definition of that term provided in [the Patent Act] and looking to the guideposts of [three previous Supreme Court cases].”<sup>206</sup> Similarly, in later cases, the Court held that an “inventive concept” is the critical distinction between substantial and trivial applications of ineligible subject matter, though the meaning of “inventive concept” remains elusive.<sup>207</sup>

Patent agents and attorneys thus must grapple with nuanced legal arguments in asserting the patent eligibility of some inventions. Moreover, technology has evolved so that issues of patent eligibility arise with greater frequency than in the past. For instance, concerns with patent eligibility often arise with patents on software and genetic testing, technologies that did not exist when the foundations of the Patent Bar were laid in the twentieth century.<sup>208</sup>

#### *E. Licensing Costs and the Slow Growth of the Patent Bar*

A final reason that the technical-education requirement is difficult to justify on economic grounds is that, in recent years, it has prevented the size of the Patent Bar from keeping pace with the growth in the demand for patent practitioner services, and this shortfall in the labor market ultimately produces higher prices and greater social costs.<sup>209</sup> As described in the Introduction, only about 26,000 attorneys and agents are members of the Patent Bar and actively represent clients today. This small group of practitioners enjoys exclusive access to a lucrative market for legal services.<sup>210</sup> Nevertheless, 2014 saw the smallest number of new admissions to the Patent Bar in a decade, with less than 1,200 people taking and passing the Patent Bar exam.<sup>211</sup> In contrast to the slow growth in the Patent Bar, the number of patent applications filed each year has steadily increased, so that today the USPTO receives 47% more applications than it did a decade ago.<sup>212</sup>

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206. *Bilski*, 561 U.S. at 612.

207. *Alice Corp.*, 134 S. Ct. at 2357.

208. *Id.* (software); *Ass'n. for Molecular Pathology*, 133 S. Ct. at 2107 (genetics); *Mayo Collaborative Servs.*, 132 S. Ct. at 1289 (medical diagnostics).

209. See *supra* notes 65–67 and accompanying text (describing the costs stemming from occupational licensing).

210. See *supra* notes 11–14 and accompanying text.

211. *Exam Results*, USPTO, <http://www.uspto.gov/ip/boards/oed/exam/past/results/#heading-1> (last visited Mar. 6, 2017). In both 2008 and 2009, more than 2,000 people were admitted to the Patent Bar. *Id.* By contrast, approximately 40,000 people become lawyers each year. Joshua Wright, *The Job Market for Lawyers: Side Work on the Rise Amid Continuing Glut of New Grads*, FORBES (Jan. 10, 2014, 11:20 AM), <http://www.forbes.com/sites/ems/2014/01/10/the-job-market-for-lawyers-side-work-on-the-rise-amid-continuing-glut-of-new-grads/#3b2074d16d07>.

212. *U.S. Patent Statistics Chart Calendar Years 1963 – 2015*, U.S. PAT. & TRADEMARK OFF. (June 15, 2016), [http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us\\_stat.htm](http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm).

The technical-education requirement is likely a major cause of the relatively slow growth in the number of patent agents and attorneys admitted to practice before the USPTO. To start, the percentage of U.S. college students graduating with engineering and science degrees has remained largely unchanged in recent years. In 2000, 16.8% of graduates received degrees in engineering or the natural sciences, compared to 16.2% in 2011.<sup>213</sup> The slow growth in the Patent Bar also stems from a further decline in the number of students with engineering and science backgrounds that are enrolling in law school. Nationwide, the number of students applying to law school has dropped precipitously. Between 2008 and 2012 the number of students taking the LSAT decreased by 31%.<sup>214</sup> Among students whose undergraduate degrees automatically satisfy the technical-education requirement, however, the decline was even sharper—a decrease of 46%.<sup>215</sup> And although representing inventors and their competitors in the USPTO requires increasing legal sophistication, a smaller percentage of patent practitioners possesses substantial legal training.<sup>216</sup> Thus, in part due to the technical-education requirement, the Patent Bar may fail to keep up with the growth in the demand for patent services in the USPTO.

### III. EFFICIENTLY EXPANDING THE PATENT BAR

The technical-education requirement thus cannot be justified on the basis of economic efficiency. The requirement likely provides little benefit given that market failures have not been shown to exist in the market for representation in the USPTO.<sup>217</sup> In addition, Patent Bar membership provides little assurance of practitioner quality, and the costs of limiting the size of the Patent Bar have grown in recent years.<sup>218</sup> As a result, the Patent Bar, as currently constituted, may not be efficiently supporting inventors and their competitors in the USPTO. Accordingly, this Part proposes a simple expansion to the Patent Bar, reviews previous efforts to reform the Patent Bar, and lays out a likely plan for implementing the recommendation.

#### A. A *Proposal for Expansion*

To maximize social welfare, the Patent Bar should be expanded to allow any attorney who is a member in good standing of a state bar to take the Patent Bar

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213. NAT'L SCI. BD., 2014 SCIENCE AND ENGINEERING INDICATORS 59 tbl.2-17 (2014), <http://www.nsf.gov/statistics/seind14/content/appendix/at.pdf>. Some of these degrees would not presumptively satisfy the USPTO's technical-education requirement, such as mathematics. *See* GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 7.

214. *End-of-year Summary: ABA (Applicants, Applications & Admissions), LSATs, Credential Assembly Service*, LSAC, <http://www.lsac.org/lsacresources/data/lsac-volume-summary> (last visited Mar. 6, 2017).

215. Port et al., *supra* note 27, at 196–97 (“In fact, the decrease of patent bar eligible students far exceeds the decrease of non-patent bar eligible law students.”).

216. *Id.*; *see also* Dennis Crouch, *Attorney v. Agent*, PATENTLY-O (Aug. 24, 2010), <http://patentlyo.com/patent/2010/08/attorney-versus-agent.html>.

217. *See supra* Sections II.A, II.C.

218. *See supra* Sections II.B, II.D, II.E.

exam, and to join the Patent Bar upon successful passage of that test.<sup>219</sup> Under this proposal, the technical-education requirement would only apply as a licensing requirement to nonlawyers seeking to become patent agents. Additionally, lawyers who satisfy the technical-education requirement would be certified as “Science/Technology Specialists.”

This proposal addresses many of the concerns raised above. To start, it would relax a market regulation that has not been economically justified. In doing so, it would expand the supply of patent services in the USPTO, thereby reducing the costs for innovators and other parties.<sup>220</sup> In fact, many attorneys who would be newly eligible to join the Patent Bar may be cheaper than current patent practitioners. As noted in the Introduction, the median salary for attorneys today is less than that of patent agents or patent attorneys.<sup>221</sup> Even parties that can afford patent agents may prefer to hire attorneys even if they lack extensive technical training. For instance, an invention might be relatively uncomplicated, such as in the case of a simple mechanical device or a business method.<sup>222</sup> Even with more complex inventions, a party might prefer to hire a legally adroit attorney if the party can help the attorney to understand the technical details.<sup>223</sup> Alternatively, a party might decide to hire a team that includes both technically sophisticated patent agents and legally sophisticated attorneys.<sup>224</sup> Some cost-sensitive parties may also prefer to hire technically unsophisticated lawyers in cases where legal issues predominate over technical issues. Finally, this proposal would particularly increase the number of Patent Bar members with experience in fields of invention that are patent eligible but are not currently recognized by the USPTO as supporting Patent Bar membership, such as business and industrial design.<sup>225</sup>

In addition to expanding the supply of services in the USPTO, this proposal is unlikely to generate the types of costs that occupational licensing regimes are designed to limit. To start, for many years, and apparently without incident, lawyers were eligible to join the Patent Bar, regardless of their technical

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219. See Richard Spencer, *The Patent Lawyer and the General Practitioner*, 81 U. PA. L. REV. 924, 936 (1933) (suggesting a similar proposal, but grounded on different justifications).

220. The extent to which attorneys would decide to join the Patent Bar under this proposal is unclear. See Kleiner, *supra* note 30, at 192 (“Individuals who attempt to enter the occupation . . . will need to balance the economic rents of the fields increased monopoly power against the greater difficulty of meeting the entrance requirements.”). Certainly, a claim that few additional attorneys would actually join the Patent Bar under this proposal provides little reason not to implement it. If few attorneys join the Patent Bar, any potential costs stemming from this proposal would likewise be small.

221. See *supra* notes 15–16 and accompanying text.

222. Inventions that are the subject of design patents also are not technically sophisticated. See *supra* notes 111–13 and accompanying text (discussing design patents).

223. See Phillips v. AWH Corp., 415 F.3d 1303, 1313 (Fed. Cir. 2015) (noting that “inventors are typically persons skilled in the field of the invention”).

224. Current USPTO regulations allow attorneys who are not members of the Patent Bar to appear pro hac vice in post-grant administrative proceedings. 37 C.F.R. § 42.10(a), (c) (2017); see also 37 C.F.R. § 42.2 (2017) (defining “trial” in the USPTO).

225. See *supra* Section II.B.1.

training.<sup>226</sup> Furthermore, this proposal will not make it more difficult for parties to assess the credentials of members of the Patent Bar. For agents, Patent Bar membership will continue to demonstrate that the agent possesses the technical qualifications endorsed by the USPTO. Likewise, parties can easily determine whether attorneys satisfy the USPTO's technical standards because those attorneys will have the additional certification of Science/Technology Specialist.<sup>227</sup> Armed with this information, market participants would be as able to identify and hire technologically appropriate patent practitioners as under the current regime.<sup>228</sup> In many cases, parties likely would choose to hire agents or attorneys who satisfy the technical-education requirement. For example, some patent applications will be both legally and technically complex, and inventors for such applications will continue to hire patent attorneys with sophisticated technical backgrounds to assist in the prosecution of these applications. Other times, however, parties may prefer to have the option of hiring attorneys without technical training, and under the proposed reform, market forces, rather than government fiat, would determine which practitioners are hired.

In fact, many parties seeking patent representation in the USPTO are well positioned to assess whether attorneys who lack the technical or scientific backgrounds currently required by the USPTO could nevertheless effectively work on matters related to certain inventions because many of those parties are themselves technically sophisticated.<sup>229</sup> Today, the vast majority of parties seeking representation in the USPTO are sophisticated actors, like corporations and universities.

Admittedly, if the proposed expansion of the Patent Bar reduces the costs of representation in the USPTO, more small companies and independent inventors may seek to hire members of the Patent Bar. While these parties may be less sophisticated in some senses, as inventors and innovators they nevertheless are likely to be technically sophisticated.<sup>230</sup> As a result, all types of parties who are interested in hiring patent practitioners can assess with relative speed and ease the extent to which technical expertise is necessary. In contrast, many parties in the USPTO are not legally trained and thus may seek representatives with more robust legal training, that is, a lawyer rather than a patent agent.

This proposal for expanding the Patent Bar would also help to maintain the quality of service offered by members of the Patent Bar. To start, all practitioners would possess sophisticated training in areas potentially relevant to

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226. See *supra* note 103 and accompanying text.

227. See *supra* notes 74–76 and accompanying text (discussing certification).

228. As argued above, it is not clear whether the current regime effectively helps clients identify practitioners with appropriate backgrounds. See *supra* Section II.B. The proposed expansion to the Patent Bar will not help clients make such technical selections, but also will not worsen matters.

229. As noted earlier, restrictive occupational licensing is more likely to be economically justified when customers lack the expertise required to evaluate the qualifications of services providers. See *supra* notes 52, 60 and accompanying text (discussing the role of expertise in occupational licensing).

230. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2015) (noting that “inventors are typically persons skilled in the field of the invention”).

patent representation in the USPTO. All patent agents would continue to possess technical or scientific training, as would any lawyers designated as Science/Technology Specialists.<sup>231</sup> For lawyers who lack such certification, Patent Bar membership would guarantee the possession of valuable training because, as explained previously, legal expertise has become important in many aspects of patent matters in the USPTO.<sup>232</sup>

Existing laws would also dissuade nontechnical lawyers from representing clients when they are unqualified. Rule 1.1 of the Model Rules of Professional Conduct, which has been adopted in all 50 states and the District of Columbia, provides as follows: “A lawyer shall provide competent representation to a client. Competent representation requires the legal knowledge, skill, thoroughness and preparation reasonably necessary for the representation.”<sup>233</sup> The comments to the Rule further clarify that in assessing whether a lawyer has violated the rule, “relevant factors include . . . the specialized nature of the matter.”<sup>234</sup> Similarly, the USPTO promulgates rules of professional conduct that apply to all members of the Patent Bar and that specify “the minimum level of conduct below which no practitioner can fall without being subject to disciplinary action.”<sup>235</sup> One of these rules provides that a practitioner “shall not . . . handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with . . . another practitioner who is competent to handle it.”<sup>236</sup>

In a sense, the proposed expansion of the Patent Bar is already at work in the context of patent litigation, where district courts do not require that attorneys possess technical credentials to represent patent owners or accused infringers. Instead, to understand the technology, attorneys often rely on technical experts and their clients. With in-depth experience in both patent law and clients’ technologies, some attorneys who are not members of the Patent Bar are thus well-suited to representing parties in the USPTO. For instance, when administrative proceedings in the USPTO involve the technology that has been the subject of district court litigation, a party might prefer to hire the same lawyer as lead counsel in the USPTO even if he or she is not a member of the Patent Bar.<sup>237</sup> Under the current

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231. *But see supra* Section II.B (arguing that Patent Bar membership provides little assurance of technical qualification).

232. *See supra* Section II.D.

233. MODEL RULES OF PROF’L CONDUCT r. 1.1 (AM. BAR ASS’N 1983); *see also* AM. BAR. ASS’N., *State Adoption of the ABA Model Rules of Professional Conduct*, ABA, [http://www.americanbar.org/groups/professional\\_responsibility/publications/model\\_rules\\_of\\_professional\\_conduct/alpha\\_list\\_state\\_adopting\\_model\\_rules.html](http://www.americanbar.org/groups/professional_responsibility/publications/model_rules_of_professional_conduct/alpha_list_state_adopting_model_rules.html) (last visited Mar. 6, 2017) (listing the dates that jurisdictions adopted the Model Rules of Professional Responsibility).

234. MODEL RULES OF PROF’L CONDUCT r. 1.1 cmt. (AM. BAR ASS’N 1983).

235. Changes to the Representation of Others Before the United States Patent Trademark Office, 78 FR 20180-01 (Apr. 3, 2013) (to be codified at 37 C.F.R. §10.20).

236. *Id.* (to be codified at 37 C.F.R. § 10.77).

237. *See supra* note 185 (discussing stay provisions).

structure of the Patent Bar, however, such a party would have no choice but to hire separate lead counsel for each matter.<sup>238</sup>

Because this proposal would ensure that members of the Patent Bar can effectively assist innovators in the USPTO, the proposal would not conflict with existing statutes or regulations regarding the Patent Bar. For example, § 2 of the Patent Act grants the USPTO the authority to regulate the Patent Bar but does not address technical backgrounds.<sup>239</sup> Instead, this statutory provision requires only that members of the Patent Bar possess “the necessary qualifications to render to applicants or other persons valuable service, advice, and assistance.”<sup>240</sup> In federal regulations passed pursuant to this statutory grant of authority, the USPTO requires that an applicant to the Patent Bar demonstrate that he or she “[p]ossesses the legal, scientific, and technical qualifications” but only those that are “necessary for him or her to render applicants valuable service.”<sup>241</sup> As discussed above, legally sophisticated lawyers who lack substantial technical education could, in many cases, provide valuable service in representing parties in patent matters in the USPTO.<sup>242</sup> Indeed, for many years the USPTO relied only on the Patent Bar exam to assess the qualifications of lawyers, not educational backgrounds.<sup>243</sup> Only the General Requirements Bulletin stands in the way of this proposal, as it establishes the highly specific, technical-education requirement.<sup>244</sup>

#### B. Previous Challenges to the Bulletin

In the past, there have been a handful of attempts to expand in limited respects the backgrounds deemed acceptable by the USPTO for admission to the Patent Bar under the Bulletin. One of the earliest challenges was brought in 1962 in the case of *Gager v. Ladd*.<sup>245</sup> There, John Gager applied to take the Patent Bar exam, but the USPTO rejected his application because he lacked the scientific and technical training required by the 1962 version of the Bulletin.<sup>246</sup> Gager appealed to the U.S. District Court for the District of Columbia arguing that his application should not be governed by the demanding specifics of the Bulletin and instead should be evaluated under the broader standard described in federal regulations that an applicant to the Patent Bar possess “the legal, scientific, and technical qualifications necessary for him or her to render applicants valuable service.”<sup>247</sup> In evaluating Gager’s argument, the court held that the USPTO’s reliance on the

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238. 37 C.F.R. § 42.10(a), (c) (2017).

239. 35 U.S.C. § 2(b)(2)(D) (2012).

240. *Id.*

241. 37 C.F.R. § 11.7(a)(ii) (2017).

242. See *supra* notes 220–222 and accompanying text.

243. See *supra* note 103 and accompanying text.

244. See GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4–8.

245. 212 F. Supp. 671 (D.D.C. 1963). Gager was not a lawyer. *Id.* at 671.

246. *Id.* at 672. At that time, the technical-education requirement in the Bulletin was, in some respects, less exclusionary than it is today. For instance, in 1962, an applicant needed only to have a degree in “engineering or physical science” rather than a degree in one of 32 enumerated majors. Compare *id.* at 673, with GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4.

247. *Gager*, 212 F. Supp. at 672–73.

Bulletin was lawful so long as it was not “arbitrary and capricious.”<sup>248</sup> Under this deferential standard of review, the court supported the USPTO’s reliance on the Bulletin, finding with little explanation that the educational requirements in the Bulletin were “reasonable.”<sup>249</sup>

Direct challenges to the substance of the Bulletin are thus difficult because courts examine only whether the Bulletin is arbitrary or capricious.<sup>250</sup> Consequently, some applicants attempted to challenge the Bulletin through procedural avenues, like the Administrative Procedures Act (“APA”). One such challenge occurred in 1990 when Phillip Premysler applied to take the Patent Bar Exam, but the USPTO rejected Premysler’s application because he lacked any of the backgrounds listed in the Bulletin.<sup>251</sup> Thereafter, Premysler went back to school to take sufficient credits to qualify to sit for the Patent Bar Exam.<sup>252</sup> By 1993, he was ready to take the exam. However, in the interim the USPTO amended the Bulletin so that when Premysler reapplied to take the Patent Bar exam, the USPTO once again rejected his application.<sup>253</sup> After unsuccessfully appealing the rejection within the USPTO to the Director of the Office of Enrollment and Discipline, Premysler brought suit in the U.S. District Court for the District of Columbia.<sup>254</sup> Premysler argued that USPTO’s reliance on the Bulletin failed to satisfy the notice-and-comment requirements of the APA, which state that an administrative agency cannot promulgate regulations without first providing public notice of the proposed regulations and allowing interested stakeholders to submit comments.<sup>255</sup> In response, the Commissioner of the USPTO argued that the Bulletin was “merely an interpretation of the agency’s regulations” and not a formal regulation subject to the APA.<sup>256</sup> As a matter of agency discretion, such “interpretive rules” and “general statements of policy” are not subject to the APA’s notice-and-comment requirements.<sup>257</sup> The district court and ultimately the U.S. Court of Appeals for the Federal Circuit agreed with the USPTO’s characterization of the Bulletin.<sup>258</sup>

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248. *Id.* at 673.

249. *Id.* The court further noted that the requirements of the Bulletin were “reasonable” because a technical degree was not strictly required if an applicant to the Patent Bar demonstrated “a long apprenticeship under a registered patent attorney or agent.” *Id.* But see Edlin & Haw, *supra* note 29, at 1134 (criticizing the use of rational-basis review for some occupational-licensing schemes).

250. *Premysler v. Lehman*, Civ. A. No. 94-0937, 1994 WL 776982, at \*3 (D.D.C. 1994), *aff’d*, 71 F.3d 387 (Fed. Cir. 1995); *Maresca v. Comm’r of Patents & Trademarks*, 871 F. Supp. 504, 507 (D.D.C. 1994), *aff’d*, 56 F.3d 80 (Fed. Cir. 1995); *Gager*, 212 F. Supp. at 673; *Premysler*, 1994 WL 776982, at \*3.

251. *Premysler*, 71 F.3d at 388.

252. *Id.* at 389.

253. *Id.*

254. *Id.*

255. *Premysler*, 1994 WL 776982, at \*3; see also 5 U.S.C. § 553 (2012).

256. *Premysler*, 1994 WL 776982, at \*3.

257. 5 U.S.C. § 553(b)(3)(a) (2012).

258. *Premysler*, 71 F.3d at 390. Indeed, the Supreme Court recently held that an agency need not be subject to notice-and-comment rulemaking when promulgating an

The Bulletin is thus doubly difficult to challenge because the USPTO has broad discretion regarding the substance of the technical-education requirement and because the public has no right to comment on the Office's use of that discretion. Having few rights, some members of the public have petitioned the USPTO to consider revising the Bulletin as a matter of administrative discretion. For example, in 1989 the Computer Law Committee of the American Bar Association passed, by a near-unanimous vote, a resolution encouraging the Patent Bar to expand the technical-education requirement to include computer science degrees.<sup>259</sup> Thereafter, the committee wrote the Commissioner of Patents and Trademarks, advocating that Patent Bar eligibility requirements be amended. The Commissioner refused.<sup>260</sup>

Eventually, the USPTO did amend the Bulletin to add computer science to the list of degrees that satisfy the technical-education requirement. However, unlike the other qualifying degrees, the USPTO added—with little explanation—an additional requirement for computer science graduates: a computer science degree would only qualify a person to take the Patent Bar exam if the computer science program was specially accredited at the time that their degrees were awarded.<sup>261</sup> As a result, many computer science graduates remain ineligible to join the Patent Bar.

Seeking to change this unusual limitation, a computer science professor and a patent law professor petitioned the USPTO in 2006 to conduct “notice and comment rulemaking to amplify the legal, scientific, and technical qualifications sufficient to sit for the [e]xamination for registration to [p]ractice before the [USPTO].”<sup>262</sup> The professors noted that the Federal Circuit held in *Premysler* that the Bulletin was not subject to notice-and-comment rulemaking, but nevertheless argued that notice and comment were appropriate, in part, because the USPTO “has often conducted notice and comment [rulemaking] even for exempt rules.”<sup>263</sup> In response to the petition, however, the USPTO asserted once again that notice-and-comment procedures do not apply to “interpretive rules” and otherwise declined to initiate a process that would allow interested members of the public to provide feedback on the technical-education requirement.<sup>264</sup>

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interpretive rule that substantially departs from an earlier interpretive rule. *Perez v. Mortg. Bankers Ass'n*, 135 S. Ct. 1199, 1200 (2015).

259. Burke & Field, *supra* note 27, at 157–58.

260. *Id.*

261. GENERAL REQUIREMENTS BULLETIN, *supra* note 20, at 4; *see supra* note 120 and accompanying text (noting that computer science majors from the Massachusetts Institute of Technology who graduated before 1996 are ineligible to join the Patent Bar).

262. Thomas G. Field, Jr., *Administrative Procedure Act Rule-Making Petition*, 4–5 (Feb. 3, 2006), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1192402](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1192402).

263. *Id.* at 3.

264. Letter from James A. Toupin, Gen. Counsel, USPTO, to Thomas G. Field, Jr., Professor, Franklin Pierce Law Ctr. 1 (May 2, 2006), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1192402](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1192402).

### C. Explaining USPTO Reluctance

Thus far, the USPTO has been reluctant to loosen the technical-education requirement or even to provide members of the public with a meaningful opportunity to comment on this issue. The USPTO's actions are difficult to justify. Allowing more public input regarding the technical-education requirement would not undermine the USPTO's capacity to effectively regulate patent practitioners. To the contrary, gathering more information about the effects of the technical-education requirement likely would help the USPTO to develop effective policy. Moreover, as described above, the technical-education requirement is subject to critique, and there may be substantial benefits to expanding the Patent Bar.<sup>265</sup>

Indeed, closer scrutiny of the USPTO's explanations for its actions further deepens the mystery surrounding its behavior. For example, in refusing the 2006 request for notice-and-comment review of the technical-education requirement, the USPTO asserted that such an approach would lead to "rigid rules" that fail to account for the "constantly changing nature of invention."<sup>266</sup> In actuality, however, notice-and-comment rulemaking would not lead to any more "rigid rules" than the current approach. To start, the Bulletin already limits the range of backgrounds that satisfy the technical-education requirement in a fashion that conflicts with the "constantly changing nature of invention." For instance, business and design majors generally cannot join the Patent Bar even though the USPTO frequently issues business method and design patents.<sup>267</sup> In addition, even if some members of the public advocated for "rigid rules," the USPTO would not be required to accept those recommendations. When proposed regulations are subject to notice and comment, the APA requires only that an agency consider the information provided by the public and provide "a concise general statement of [a rule's] basis and purpose."<sup>268</sup>

Perhaps a more coherent explanation of the USPTO's reluctance to expand the Patent Bar stems from the financial self-interest of many of its employees. As described above, one effect of the technical-education requirement is to limit supply in the labor market for representation in the USPTO, which in turn reduces competition in that market.<sup>269</sup> Employees of the USPTO often benefit directly from this restriction of competition because many of them leave the USPTO to become patent agents and attorneys in the private sector. In fact, there has long been a close connection between the USPTO and the Patent Bar. By one 1934 estimate, as many as half of all patent attorneys began their careers as patent examiners.<sup>270</sup>

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265. See *supra* Section II.A.

266. Letter from James A. Toupin, *supra* note 264, at 2.

267. See *supra* Section II.B.1.

268. 5 U.S.C. § 553(c) (2012).

269. See *supra* Section II.C (discussing the typical costs and benefits of the technical-education requirement).

270. Lee R. Schermerhorn, *Law, and the Patent Examiner*, 16 J. PAT. OFF. SOC'Y 751, 751 (1934); see also Edwin W. Teale, *The Patent Office Has Become a National Disgrace*, POPULAR SCIENCE, June 1930, at 132 (noting that many patent examiners consider employment at the USPTO to be a "stepping-stone to a career in...patent law").

Today, many examiners continue to leave the USPTO for the higher salaries available in private practice. Indeed, USPTO regulations explicitly support patent examiners launching careers in private practice in that patent examiners who have performed satisfactorily for as little as two fiscal years can join the Patent Bar automatically after leaving their government posts without taking the Patent Bar exam.<sup>271</sup> As a result, expanding the Patent Bar would reduce the future economic prospects of many USPTO employees. Moreover, lucrative private industry salaries also help to maintain higher salaries in the USPTO because, to retain experienced patent examiners, the USPTO must offer government salaries and benefits that compete with opportunities in the private sector. Even employees that plan to stay at the USPTO thus face incentives to support a restrictive technical-education requirement.<sup>272</sup>

#### **D. Paths Forward**

One path to implementing the proposed reform is to revisit the avenues previously pursued by challengers to the Patent Bar. For instance, a person denied entrance into the Patent Bar could assert that the Bulletin violates the APA because it was promulgated without notice and comment. This argument failed in the past because the USPTO successfully argued to courts that the technical-education requirement was not part of a regulation and instead was merely a nonbinding “statement of policy.”<sup>273</sup> In actuality, however, administrative decisions within the USPTO belie its claim that the standards of the Bulletin are nonbinding policy statements. A person seeking to take the Patent Bar exam must submit an application to the Director of Enrollment and Discipline, who reviews the applications to determine, *inter alia*, whether the applicant possesses “sufficient basic training in scientific and technical matters.”<sup>274</sup> When the Director rejects an application, an applicant can appeal this decision to the Commissioner of Patent and Trademarks, and the USPTO makes some of these materials available to the public through its website.<sup>275</sup> In all of the decisions disclosed on the USPTO

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271. 37 C.F.R. § 11.7(d)(1)(iii) (2017). The USPTO requires that examiners satisfy the technical-education requirement before being hired. Burke & Field, *supra* note 27, at 158; see also *Patent Examiner Positions*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/web/offices/pac/exam.htm> (last visited Mar. 24, 2017) (stating that patent examiners must have “knowledge in one or more disciplines—biology, chemistry, physics, chemical engineering, electrical engineering, mechanical engineering, computer engineering, or computer science”).

272. As the Supreme Court recently noted, “active market participants cannot be allowed to regulate their own markets” without potentially engaging in conduct that harms consumers. *N.C. State Bd. of Dental Examiners v. FTC*, 135 S. Ct. 1101, 1111 (2015); see also Edlin & Haw, *supra* note 29, at 1103–04 (noting that licensing boards with financial interests in limiting competition “often succumb to the temptation of self-dealing, creating regulations to insulate incumbents rather than to ensure public welfare”).

273. *Premysler v. Lehman*, 71 F.3d 387, 389 (Fed. Cir. 1995).

274. Changes to the Representation of Others Before the United States Patent Trademark Office, 78 FR 20180-01 (Apr. 3, 2013) (to be codified at 37 C.F.R. §10.7).

275. *Id.* (codified at 37 C.F.R. 10.2(c)); *OED Reading Room*, USPTO, <http://efoia.uspto.gov/Foia/OEDReadingRoom.jsp> (last visited Mar. 6, 2017) (selecting “Technical” for “Decision type”).

website in which an application was rejected for failure to satisfy the Bulletin, the Commissioner of Patents affirmed the decision of the Office of Enrollment and Discipline.<sup>276</sup> In other words, while the USPTO claims that the Bulletin is nonbinding, there do not appear to have been any instances where it actually departed from the details of the Bulletin.

Nevertheless, existing precedent supporting the USPTO's discretion in establishing the contours of the technical-education requirement may prove insurmountable. Debunking the USPTO's claim that the technical-education requirement in the Bulletin is nonbinding, and thus not subject to the APA, may be difficult given that the USPTO has consistently claimed to have discretion to depart from the Bulletin—even if it has not exercised it.

Moreover, even if the USPTO engaged in notice-and-comment rulemaking, it might simply reenact a requirement for Patent Bar members to possess technical educations, particularly because many current members of the Patent Bar would have an incentive to advocate for such a requirement. By limiting the supply of legal services in patent matters in the USPTO, the technical-education requirement increases the profits of those who are able to join the Patent Bar. For their part, many current employees of the USPTO would be inclined to embrace the self-interested recommendations of the existing Patent Bar given the economic kinship between the Patent Bar and USPTO employees.<sup>277</sup>

As a result of these barriers to reform, lobbying may be needed. Of course, existing organizations for patent practitioners, such as the American Intellectual Property Lawyers Association, are unlikely to take up this charge, as it would increase the competition facing current Patent Bar members. An organization with members who are lawyers but not patent practitioners, such as the American Bar Association, would thus be more likely to spearhead this reform effort. Indeed, the ABA recently focused on programs to expand access to legal services. Much of this effort involves proposals to allow nonlawyers to represent clients in certain legal matters.<sup>278</sup> Ironically, the ABA has overlooked an opportunity to advocate for lawyers themselves to expand access to legal services in the USPTO. Congress may also be receptive to expansions to the Patent Bar because it could reduce the financial barriers facing innovators to utilizing the patent system, thereby promoting innovation. Moreover, the proposed expansion of the Patent Bar could improve the USPTO's capacity to retain examiners by reducing the advantages of the private sector that stem from reduced competition.

## CONCLUSION

The U.S. Constitution provides that the primary goal of patent law is to “promote the progress...of the useful Arts.”<sup>279</sup> To do so, lawmakers and scholars

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276. *OED Reading Room*, *supra* note 275.

277. *See supra* Section II.C.

278. ABA COMM'N ON THE FUTURE OF LEGAL SERVS., ISSUES PAPER CONCERNING NEW CATEGORIES OF LEGAL SERVICE PROVIDERS 7–11 (Oct. 16, 2015), [http://www.americanbar.org/content/dam/aba/images/office\\_president/delivery\\_of\\_legal\\_services\\_completed\\_evaluation.pdf](http://www.americanbar.org/content/dam/aba/images/office_president/delivery_of_legal_services_completed_evaluation.pdf).

279. U.S. CONST. art. I, § 8, cl. 8.

endeavor to craft patent laws that maximize social welfare, and consequently assess the efficacy of different facets of patent law by weighing the attendant costs and benefits. For instance, commentators typically evaluate proposed patent reforms that raise the costs of acquiring patents to determine if those reforms provide sufficient offsetting benefits.<sup>280</sup> Surprisingly, although innovators spend billions of dollars each year on representation in the USPTO, this cost-benefit approach has not been applied to the structure of the Patent Bar. Moreover, in the absence of market failures, both legal and economic scholars generally agree that free-market competition is more economically efficient than occupational licensing.<sup>281</sup> At least for nontechnical lawyers, however, the technical-education requirement of the Patent Bar has not been and cannot be justified by such market failures.

To the contrary, the technical-education requirement as currently constituted is restricting market forces to the detriment of society. It artificially limits the supply of labor in the service market for patent representation in the USPTO, thereby reducing competition and raising prices. This market intervention is particularly restrictive in fields that are eligible for patent protection, like designs and business methods, but for which undergraduate degrees in those fields do not satisfy the technical-education requirement. Similarly, the effect of the technical-education requirement is particularly concerning regarding legal expertise because fewer people have training in both disciplines, yet the demand for legal expertise in the USPTO has grown, as patent matters in the USPTO have become more legally complex.

At the same time, the technical-education requirement provides few market benefits—if any—when it excludes lawyers from the Patent Bar. Critically, Patent Bar membership provides little information or assurance of technical sophistication. USPTO regulations allow members of the Patent Bar to work on matters unrelated to the technical educations that initially supported their membership. Many consumers consequently select representation in the USPTO based on individual qualifications of agents and attorneys, rather than simply their membership in the Patent Bar. For most parties seeking representation in the USPTO, this selection is not difficult as they are technically sophisticated and therefore can cheaply and accurately assess the technical qualifications of others.

The expansion to the Patent Bar proposed in this Article—allowing lawyers to take the Patent Bar exam regardless of their technical backgrounds and certifying appropriate lawyers as Science/Technology Specialists—would allow

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280. E.g., F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C.L.REV. 55, 110 (2003) (arguing that the cost to patentees of improved drafting “are substantially less than those associated with litigating”); Scott Miller, *Enhancing Patent Disclosure for Faithful Claim Construction*, 9 LEWIS & CLARK L.REV. 177, 196, 204 (2005) (noting that “it would of course be foolish to mandate new disclosure rules so exacting that the increased cost of patent preparation swamps any predictability benefit that the changes would produce.”); Kelly Casey Mullally, *Patent Hermeneutics: Form and Substance in Claim Construction*, 59 FLA. L.REV. 333, 380 (2007) (arguing that the cost of increased disclosure in patents may be “offset in the avoidance of greater costs to the public and the avoidance of litigation”).

281. See *supra* Section II.B.

the market for services in the USPTO to operate more freely, thereby reducing the cost of the technical-education requirement. Reforming the Patent Bar will, however, be difficult. Existing members of the Patent Bar enjoy its restrictive nature and therefore may oppose efforts to increase competition. Moreover, because of the close connection between the USPTO and the Patent Bar, many employees of the USPTO face similar economic incentives to oppose expansions to the Patent Bar. Congressional intervention may be required, perhaps with the support of lobbying by nontechnical lawyers who would benefit from the proposed expansion to the Patent Bar.