

**THE NEGLECTED DIMENSION OF PATENT LAW'S
PHOSITA STANDARD**

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TABLE OF CONTENTS

I. INTRODUCTION.....	227
II. PATENTABILITY AND THE PHOSITA.....	229
A. <i>The Modern Standard of Patentability</i>	229
B. <i>The PHOSITA Standard</i>	233
C. <i>The Neglected Dimension of the PHOSITA Standard</i>	237
III. THE DRIFTING DEFINITION OF “ART”: 1790–PRESENT.....	239
A. <i>The Mechanic: 1790s–1970s</i>	239
B. <i>The Designer: 1950s–Present</i>	242
C. <i>The Researcher: 1970s–Present</i>	243
IV. JUSTIFYING A RETURN TO THE TRADITIONAL PHOSITA STANDARD.....	247
A. <i>The Shift to “Researcher” Has Not Been Made Deliberately</i>	249
B. <i>A “Researcher” Conception Is a Significant Break with Traditional Patent Doctrine</i>	250
C. <i>PHOSITA as “Researcher” Reduces Incentives to Invent</i>	253
1. <i>A “Researcher” Conception Assumes that Research Will Occur Without Patents</i>	253
2. <i>Lessons from Design Patent Doctrine — In re Laverne</i>	255
V. ACHIEVING THE IDEAL PHOSITA STANDARD.....	256
VI. CONCLUSION.....	257

I. INTRODUCTION

A patent cannot issue on an invention that would have been obvious to a “person having ordinary skill in the art” (a “PHOSITA”).¹ Patent law’s PHOSITA standard is a central concept throughout the lifetime of a patent; it not only helps to determine whether a patent

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1. 35 U.S.C. § 103(a) (2006).

can issue but also defines the scope of claims during the patent term and impacts the infringement analysis. Nevertheless, it has been the subject of only modest scholarly dialogue and has received even thinner treatment by courts.²

One critical dimension of the PHOSITA's perspective — the activity in which the PHOSITA is presumed to be ordinarily skilled — has remained largely unexamined despite being fundamentally important to patent law's animating purposes.³ This aspect of the PHOSITA's art involves more than a mere inquiry as to field or skill level; it also involves an understanding of what the PHOSITA does within that field. Traditionally, the PHOSITA has been presumed to be skilled, within a given field, at repetitive processes that produce expected results. Over the last half century, however, this "ordinary mechanic" characterization of the PHOSITA has been transformed by judicial opinions such as *KSR International v. Teleflex Inc.*⁴ to one that comes dangerously close to that of "ordinary inventor." Stated another way, the tacit understanding of the PHOSITA's art has drifted from its original meaning of practicing an art to researching new and better methods or devices within that art — i.e., to the art of invention itself.

This unacknowledged conceptual shift threatens to undermine fundamental patent law objectives. Because patent law is intended to encourage investment in activities likely to lead to improvements in an art — that is, research⁵ — a conception of the PHOSITA as an "ordinary researcher" becomes counterproductive. Such a doctrinal construction is the legal equivalent of trying to elevate oneself by standing in a bucket and pulling upward on the handle. An external point of reference is needed, and that reference is a PHOSITA who is practicing an art, not one who is actively seeking to innovate within it. A conception of the PHOSITA that begins from the premise that research is already taking place begs the question of why the patent incentive is needed at all.

Part II provides a brief overview of patent law requirements and the PHOSITA standard, explaining how a critical dimension of the

2. See sources cited *infra* note 47. Scholarly attention to the PHOSITA has increased since the Supreme Court's 2007 *KSR* decision. *Id.*

3. See Gregory Mandel, *The Non-Obvious Problem: How the Indeterminate Nonobviousness Standard Produces Excessive Patent Grants*, 42 U.C. DAVIS L. REV. 57, 74 (2008) (noting that current PHOSITA doctrine fails "to resolve whether the person of ordinary skill [in *Graham*] is a farmer or laboratory researcher"). Scholarship has, however, addressed the issue of analogous arts. See *infra* notes 49–51 and accompanying text. While the issue of analogous art is relevant in determining which references qualify as prior art, it does not directly address the question of the PHOSITA's perspective. See generally DONALD S. CHISUM, CHISUM ON PATENTS § 5.03[1][a] (2005) (discussing analogous arts).

4. 550 U.S. 398 (2007).

5. Peter S. Menell & Suzanne Scotchmer, *Intellectual Property Law*, in 2 HANDBOOK OF LAW AND ECONOMICS 1474, 1476 (2007).

PHOSITA's perspective has been virtually ignored. Part III traces this dimension of the PHOSITA's art from 1790 to the present, demonstrating how it has shifted in subtle yet significant ways, particularly since the 1950s. Part IV argues that a return to the conception of the PHOSITA as practicing a stable art (as opposed to innovating within an art) is consistent with the policy goal of promoting invention. Part V provides broad guidelines for the appropriate conceptual development of the PHOSITA's perspective.

II. PATENTABILITY AND THE PHOSITA

The modern standard of patentability in the United States derives from the Constitution, which entrusts Congress with the authority to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."⁶ Patents promote technological advances by conferring economic rewards on inventors for their socially useful inventions.⁷ The patent right is a type of monopoly right, protecting inventors from copying and competition for a limited period of time. Inventors are rewarded with the ability to charge monopoly prices for their inventions during the patent term. Subject to market forces, the magnitude of the reward will depend on the magnitude of the contribution to society.⁸ Thus, via the Constitution's Patent Clause, the Framers memorialized their belief that patents should serve the primary purpose of inducing invention for the collective good.⁹

A. The Modern Standard of Patentability

While numerous revisions to the patent statute have taken place since the first federal patent law was enacted in 1790,¹⁰ the fundamen-

6. U.S. CONST. art. I, § 8, cl. 8.

7. See *Eldred v. Ashcroft*, 537 U.S. 186, 227 (2003) (Stevens, J., dissenting); *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257, 262 (1979) (describing three purposes of patent law: (1) rewarding invention; (2) promoting disclosure; (3) preserving the availability of that which is already in the public domain).

8. See JOHN STUART MILL, *PRINCIPLES OF POLITICAL ECONOMY WITH SOME OF THEIR APPLICATIONS TO SOCIAL PHILOSOPHY* 563 (1872) (noting that under a patent system, "the greater the usefulness, the greater the reward").

9. See *United States v. Line Materials Co.*, 333 U.S. 287, 316 (1948) (Douglas, J., concurring) (stating that "the reward to inventors is wholly secondary" to technological advance); see also THE FEDERALIST NO. 43 (James Madison) (noting that the public good coincides with individual patent rights).

10. Patent Act of 1790, ch. 7, § 1, 1 Stat. 109. For examples of revisions to the original Patent Act, see Patent Act of 1952, Pub. L. No. 82-593, § 5, 66 Stat. 792; Patent Act of 1870, ch. 230, 16 Stat. 198; and Patent Act of 1836, ch. 357, 5 Stat. 117. For a specific example of the development of the nonobviousness standard, see *infra* notes 23–28 and accompanying text.

tal requirements of patentability have been remarkably well conserved. The current standard provides that only novel, useful, nonobvious, and fully enabled inventions are patentable.¹¹ The novelty requirement ensures that inventions already known or available to the public remain within the public domain. For example, an invention whose patent period has expired can never be re-patented.¹²

The utility requirement ensures that patents be granted only on inventions that can be put to some nontrivial, beneficial use.¹³ While the degree of usefulness needed to support a patent is extremely minimal,¹⁴ the utility requirement effectively prevents patents from issuing on frivolous or maleficent inventions, such as those that purport to defy the laws of physics¹⁵ or whose only use is an illegal one.¹⁶

While novelty and utility are necessary conditions to patentability, they are not sufficient. An invention must also be disclosed so as to effectively place it within practical reach of the public. The enablement requirement ensures that enough information is disclosed in the patent application so that a person skilled in the relevant art is able to “make and use” the invention.¹⁷ Because patent applications are generally made available to the public eighteen months after the application is filed, this information may help to promote technological

11. 35 U.S.C. §§ 101–03, 112 (2006). Inventions, to be patentable, must also comprise appropriate subject matter. *Id.* § 101. Due to the broad scope of § 101, however, subject matter is an infrequent basis of rejection. *See Diamond v. Chakrabarty*, 447 U.S. 303, 308–09 (1980) (explaining that patentable subject matter “include[s] anything under the sun that is made by man” (quoting S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 1923, at 6 (1952))) (internal quotation marks omitted).

12. 35 U.S.C. § 102.

13. *See Brenner v. Manson*, 383 U.S. 519, 532–35 (1966).

14. Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 803, 812 (1988) (“Today, a patent will not be withheld even though the invention works only in an experimental setting, and has no proven use in the field or factory.”); Joseph P. Pieroni, *The Patentability of Expressed Sequence Tags*, 9 FED. CIR. B.J. 401, 405 (2000) (“The utility requirement is usually considered a very low hurdle, a de minimis standard.”) (internal citation omitted); Kathleen N. McKereghan, Note, *The Nonobviousness of Inventions: In Search of a Functional Standard*, 66 WASH. L. REV. 1061, 1077 n.94 (1991) (“[T]he utility requirement has long had a very low threshold.”)

15. *See, e.g., In re Swartz*, 232 F.3d 862 (Fed. Cir. 2000) (affirming rejection of claims for invention concerning cold fusion for not meeting utility requirement); *Newman v. Quigg*, 877 F.2d 1575, 1577, 1582 (Fed. Cir. 1989) (affirming rejection of patent claims for a “perpetual motion machine” on the grounds that “perpetual motion is impossible”). *See generally* 35 U.S.C. § 101 (setting forth utility requirement).

16. *See Lowell v. Lewis*, 15 F. Cas. 1018, 1019 (C.C.D. Mass. 1817) (No. 8,568); *cf.* 35 U.S.C. § 271 (forming the basis of the staple article of commerce doctrine, which limits secondary patent liability where the accused device is “suitable for substantial noninfringing use”). The utility requirement also prevents the patenting of inventions that possess utility that is so indirect or general that the grant of a patent might inhibit downstream research rather than promote it. *In re Fisher*, 421 F.3d 1365, 1370–71 (Fed. Cir. 2005).

17. 35 U.S.C. § 112.

advance via non-infringing uses of the information even before the end of the patent term.¹⁸

The nonobviousness requirement prevents the patenting of slight variations of known inventions.¹⁹ As with the novelty requirement, the nonobviousness requirement is intended to prevent the withdrawal of inventions from the public domain,²⁰ since those inventions that are literally novel but which would have been obvious to the PHOSITA are already within reach of the public. Due to its critical role as a gatekeeper of unpatentable inventions, the nonobviousness requirement has been dubbed the “ultimate condition of patentability,”²¹ and perhaps no concept in patent law has inspired more vigorous discussion and debate over so long a period of time.

Although it may be common sense to exclude slight variations of known inventions from patentability, the most vexatious aspect of nonobviousness lies not in justifying its role but in appropriately defining the degree of advance required to merit patent protection.²² This question of degree, now addressed under the rubric of “nonobviousness,” has been placed doctrinally in various corners of the patent law architecture throughout the history of the nation. From the late 1700s, the degree of advance over the prior art thought sufficient to sustain a patent was sometimes framed in terms of utility. For example, under the Patent Act of 1790 only those inventions “sufficiently useful and important” were patentable.²³ At other times, the nonobvi-

18. *Id.* § 122. Published patents are available on the website of the United States Patent and Trademark Office (“USPTO”). USPTO, Patent Databases, <http://patft.uspto.gov/> (last visited Dec. 20, 2009).

19. 35 U.S.C. § 103.

20. *See Sakraida v. Ag Pro, Inc.* 425 U.S. 273, 281 (1976) (“A patent . . . which only unites old elements with no change in their respective functions . . . obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men.” (quoting *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152–53 (1950))) (internal quotation marks omitted).

21. NONOBVIOUSNESS — THE ULTIMATE CONDITION OF PATENTABILITY (John Witherspoon ed., 1980) [hereinafter NONOBVIOUSNESS] (compiling papers to commemorate the twenty-fifth anniversary of the passage of 35 U.S.C. § 103).

22. *See, e.g.,* JOSEPH BARNES, TREATISE ON THE JUSTICE, POLICY, AND UTILITY OF ESTABLISHING AN EFFECTUAL SYSTEM FOR PROMOTING THE PROGRESS OF USEFUL ARTS 27 (1792) (lamenting “the *indeterminate* principle upon which patents are granted”); Robert Starr Allyn, *Patentable Yardsticks*, 25 J. PAT. OFF. SOC’Y 791, 791 (1943); L.B. Mann, *Testing for Invention*, 15 J. PAT. OFF. SOC’Y 6, 6 (1933) (quoting an 1891 speech calling for a new definition of invention). Indeed, the Supreme Court has stated that nonobviousness cannot be precisely defined. *McClain v. Ortmayer*, 141 U.S. 419, 427 (1891) (stating that the question of obviousness “is a question which cannot be answered by applying the test of any general definition”).

23. Patent Act of 1790, ch. 7, § 1, 1 Stat. 109, 110; *see also* THOMAS WEBSTER, ON THE SUBJECT-MATTER OF LETTERS-PATENT FOR INVENTIONS 26 (1841) (“[I]f the change be immaterial or useless . . . that change will not be sufficient to support a patent.”). The requirement that an invention be “sufficiently useful and important” formed a part of the patent law from 1790–1793 and from 1836–1952. *See* Kevin J. Lake, *Synergism and Nonobviousness: The Rhetorical Rubik’s Cube of Patentability*, 24 B.C. L. REV. 697, 701 n.26 (1983). Despite the purported requirement during these periods that an invention be

ous requirement was characterized as a refinement of novelty.²⁴ At still other times, nonobviousness was contained within an “invention” requirement, distinct from either novelty or utility.²⁵

It was not until 1952, after more than one hundred years of percolation in judicial opinions²⁶ and scholarly commentary,²⁷ that nonobviousness was crafted into a distinct statutory requirement. This section, codified at 35 U.S.C. § 103, now reads:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been *obvious* at the time the invention was made *to a person having ordinary skill in the art* to which said subject matter pertains²⁸

It is from this statute that the PHOSITA standard directly derives.²⁹ No reported judicial decision or law review article prior to the passage

“sufficiently useful and important,” legal historian Edward C. Walterscheid notes that exhaustive research failed to uncover any evidence of patents being denied or invalidated as a result of being deemed not sufficiently useful and important. E-mail from Edward C. Walterscheid to author (Aug. 3, 2009) (on file with author); *see also* Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 398 (1960) (“The old phrase, ‘sufficiently useful and important,’ was . . . disused and moribund . . .”).

24. Patent Act of 1793, ch. 11, § 2, 1 Stat. 318, 321 (stating that simple changes of “form or the proportions of any machine, or composition of matter” are not patentable); *see also* *Evans v. Eaton*, 8 F. Cas. 846, 853 (C.C.D. Pa. 1816) (No. 4,559) (noting that a mere change in “form or proportions . . . has not the merit of a discovery which can entitle the party to a patent”); BARNES, *supra* note 22, at 31 (advocating against the patentability of mere changes in form or proportion); GEORGE TICKNOR CURTIS, A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS 25 (3d ed., 1867) (“[M]ere colorable variations, or slight and unimportant changes, will not support a patent.”); P.J. Federico, *Origins of Section 103*, 5 APLA Q.J. 87, 97 n.5 (1977) (noting that nonobviousness is an “extension of the . . . requirement for novelty”).

25. *See* A. Samuel Oddi, *Beyond Obviousness: Invention Protection in the Twenty-First Century*, 38 AM. U. L. REV. 1097, 1121–24 (1989) (noting that § 103 has in practice replaced a “separate invention requirement”); *see also* WILLARD PHILLIPS, THE LAW OF PATENTS FOR INVENTIONS 125–26 (1837) (stating, more than one hundred years prior to the Patent Act of 1952, that obvious changes are not patentable).

26. *Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248 (1850), is generally cited as originating the obviousness doctrine, though neither the word “obvious” nor its variants appear in the majority opinion. *See id.*

27. *See, e.g.*, CURTIS, *supra* note 24, at 25; PHILLIPS, *supra* note 25, at 125–26; WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS 114–77 (1890); JOHN BARKER WAITE, PATENT LAW 37–75 (1920); WEBSTER, *supra* note 23, at 26; Richard Eyre, *Why Patent Protection is Needlessly Uncertain*, 6 J. PAT. OFF. SOC’Y 259 (1923–1924); Mann, *supra* note 22; 25 J. PAT. OFF. SOC’Y 771–840 (1943) (entire journal issue primarily devoted to obviousness).

28. 35 U.S.C. § 103(a) (2006) (emphasis added).

29. Cyril A. Soans coined the term PHOSITA fourteen years later in an article in which he discussed “Mr. Phosita,” a personification of the hypothetical person having ordinary

of § 103 had used the phrase “person having ordinary skill in the art” or the acronym “PHOSITA.”³⁰

B. The PHOSITA Standard

Despite its new name, the PHOSITA standard itself traces its origins to nineteenth century case law.³¹ In the landmark 1850 case of *Hotchkiss v. Greenwood*,³² the Supreme Court held unpatentable an improvement on a doorknob, explaining that “unless more ingenuity and skill . . . were required [to make the invention] . . . than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention.”³³ Other cases described the concept in terms of “ordinary skill,” “ordinary mechanical knowledge,” or similar language.³⁴

Just as the nonobviousness standard reflects the common sense approach that trivial variations should not be patentable, the PHOSITA standard reflects the common sense notion that the question of whether a variation is trivial should not be determined from the perspective of someone who knows nothing about the field in question but rather from the perspective of one who is ordinarily skilled in that field. The PHOSITA standard thus ensures that the bar to patentability remains high by reminding judges that what might not seem

skill in the art. Cyril A. Soans, *Some Absurd Presumptions in Patent Cases*, 10 IDEA 433, 438–39 (1966) (offering an invective against the Court-created “superhuman Frankenstein monster Mr. Phosita,” who had powers extending far beyond those of the ordinarily skilled artisan).

30. The Federal Circuit adopted the term “PHOSITA” in 1984. *See* *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1454 n.5 (Fed. Cir. 1984) (discussing Soans’s article). The term PHOSITA is now firmly established in patent law scholarship, although most recent allusions to “Mr. Phosita” have dropped the honorific “Mr.” and placed the remaining acronym in all capital letters.

31. *See* Federico, *supra* note 24, at 92 (“The expression ‘obvious to an ordinary person skilled in the art’ did not come from any specific single court decision, but was a synthesis of numerous equivalent expressions . . .”). In referring to court decisions containing “equivalent expressions,” Federico may have contemplated not only early obviousness cases, such as *Hotchkiss*, but also cases addressing the enablement standard. *See infra* note 97.

32. 52 U.S. 248 (1850).

33. *Id.* at 267.

34. *See, e.g.,* *Smith v. Springdale Amusement Park, Ltd.*, 283 U.S. 121, 123 (1931) (“ordinary mechanical skill”); *Haughey v. Lee*, 151 U.S. 282, 283 (1894) (“ordinary mechanical knowledge and skill”); *Commercial Mfg. Co. v. Fairbank Canning Co.*, 135 U.S. 176, 191 (1890) (“ordinarily intelligent person, skilled in the art”); *Am. Stainless Steel Co. v. Ludlum Steel Co.*, 290 F. 103, 107 (2d Cir. 1923) (“man skilled in the art”); *In re Niedringhaus*, 9 D.C. (2 MacArth.) 149, 156 (D.C. 1875) (“persons ordinarily skilled in the art”); *Stanley v. Whipple*, 22 F. Cas. 1046, 1047 (C.C.D. Ohio 1839) (No. 13,286) (“a person, possessing ordinary skill”).

obvious to them may nevertheless be obvious to an ordinarily skilled artisan.³⁵

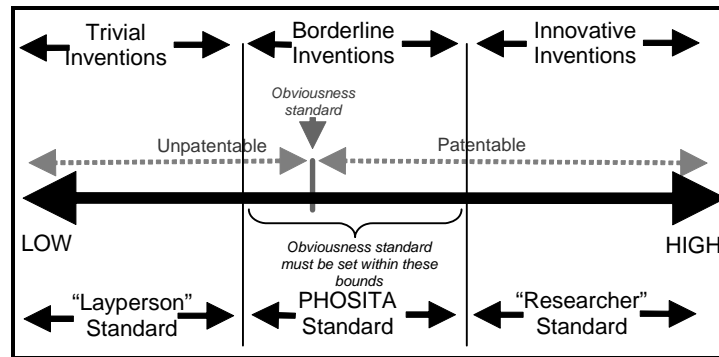
The PHOSITA standard, however, does not merely set a floor for patentability; it also sets a ceiling for how rigorous the standard can be. By requiring obviousness to be determined from the perspective of those ordinarily skilled in the art, the PHOSITA standard deliberately excludes those of extraordinary skill.³⁶ The word “ordinary” reminds judges that those working in the art at the time of an invention could not necessarily predict future developments in the art that in hindsight might appear to have been inevitable.³⁷ The concept of the PHOSITA standard can therefore be viewed as a collar on the obviousness standard that both: (1) prevents the patentability of trivial inventions and (2) preserves the patentability of meritorious ones. As seen in Figure 1, if the potential obviousness standard is visualized as a continuum, the concept of the PHOSITA standard sets a range or collar within which the appropriate obviousness standard must reside. If a particular PHOSITA standard is set too low in a given case (“‘Layperson’ Standard”), then a trivial invention will become patentable. If a particular PHOSITA standard is set too high in a given case (“‘Researcher’ Standard”), then an innovative invention will become unpatentable.

35. Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 887–88 (2004).

36. See *Env'tl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 697 (Fed. Cir. 1983) (both laymen and geniuses are excluded from the PHOSITA standard); *Abington Textile Mach. Works v. Carding Specialists (Can.) Ltd.*, 249 F. Supp. 823, 829 (D.D.C. 1965) (noting that Edison would not have qualified as a PHOSITA); see also *N. Am. Vaccine Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1580 (Fed. Cir. 1993) (Rader, J., dissenting) (“[I]nventors generally have extraordinary skill . . .”); *Ziggity Sys., Inc. v. Val Watering Sys.*, 769 F. Supp. 752, 800 (E.D. Pa. 1990) (“Inventors . . . are presumed to have extraordinary skill in the art.”); Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1197 (2002) (“[C]ourts must avoid the temptation to assume that the expert witness is a person ordinarily skilled in the art.”).

37. See *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1574 (Fed. Cir. 1986) (“The primary value in the requirement that level of skill be found lies in its tendency to focus the mind of the decisionmaker away from what would presently be obvious . . . and toward what would, when the invention was made, have been obvious . . .”), *overruled on other grounds by Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337 (Fed. Cir. 2004); see also Tom Arnold, *Future Considerations — Views of a Private Practitioner*, in NONOBVIOUSNESS, *supra* note 21, at 8:1 (arguing that the patent system fails to adequately address the hindsight problem); Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration That the Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391 (2006) (offering evidence that the hindsight problem results in an excessively elevated nonobviousness bar); Gregory Mandel, *Patently Non-Obvious II: Experimental Study on the Hindsight Issue Before the Supreme Court in KSR v. Teleflex*, 9 YALE J.L. & TECH. 1 (2007) (observing that hindsight bias is not adequately addressed by secondary consideration evidence, jury instructions, the *Graham* framework, or the Federal Circuit’s teaching, suggestion, or motivation test).

Figure 1: PHOSITA Standard as a Collar on the Obviousness Standard



The PHOSITA is a hypothetical person, judicially endowed with those traits thought to best serve the goals of the patent system.³⁸ For example, the PHOSITA is presumed to have read, understood, and remembered every existing reference from the prior art.³⁹ Although unrealistic, this presumption helps to avoid difficult issues of proof related to the inventor's actual knowledge and prevents obvious variations of publicly disclosed inventions from being captured through subsequent patent grants.⁴⁰ The PHOSITA also possesses the level of creativity typical of persons in the relevant art and of the relevant skill level, a presumption intended to prevent common sense inventions from slipping through the patentability screen due to overly technical

38. The PHOSITA standard has been likened to the reasonable person standard in tort law. See *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566 (Fed. Cir. 1987) (explaining that "a person having ordinary skill in the art" [is] not unlike the 'reasonable man' and other ghosts in the law").

39. *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985). The characterization of the PHOSITA as selectively omniscient was traced by Soans to *Mast, Foos & Co. v. Stover Manufacturing Co.*, 177 U.S. 485, 493 (1900) (charging an inventor with "a knowledge of all preexisting devices"), but the Federal Circuit has suggested that the roots likely reach even further into history. See *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1450 (Fed. Cir. 1984) (tracing the presumption of the inventor's knowledge of prior art to *Eaton v. Evans*, 16 U.S. (3 Wheat.) 454 (1818)). The law of other countries does not universally conceive of the PHOSITA as selectively omniscient. See Richard Weiner, *Nonobviousness: Foreign Approaches*, in *NONOBVIOUSNESS*, *supra* note 21, at 7:413 (noting that South African law uses a "common knowledge" standard).

40. For a discussion of the benefits of an objective PHOSITA standard, see Robert P. Merces, *Uncertainty and the Standard of Patentability*, 7 *HIGH TECH. L.J.* 1, 14–15 (1992). Scholars have sometimes criticized the presumption of selective omniscience. See, e.g., Daralyn J. Durie & Mark A. Lemley, *A Realistic Approach to the Obviousness of Inventions*, 50 *WM. & MARY L. REV.* 989, 991–92, 1017 (2008) (stating that "KSR overshoots the mark" in raising the nonobviousness standard and arguing that the PHOSITA standard should be reconceived based "on what the PHOSITA and the marketplace actually know and believe"); Soans, *supra* note 29, at 438–39 (1966);

notions of what constitutes relevant prior art.⁴¹ The PHOSITA standard is thus a useful fiction that serves as a doctrinal lens through which the court may decide whether an invention should or should not be patentable.⁴²

The PHOSITA standard calibrates not only obviousness, but also a variety of other patent law standards.⁴³ Section 112 requires that the patent specification “contain a written description of the invention” sufficient “to enable any person skilled in the art” to make and use the invention.⁴⁴ Thus, whether a patent has disclosed enough to place the invention within reach of the public depends on the characteristics of the PHOSITA. The PHOSITA standard is also relevant to claim construction, where it is applied to determine what one of ordinary skill in the art would have understood the claim to mean. Finally, it affects infringement determinations, helping to define whether an accused device contains an element that would have been understood as an equivalent to a claimed element.⁴⁵

41. *See* *KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“[A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”).

42. *See, e.g., In re Nalbandian*, 661 F.2d 1214, 1216 (C.C.P.A. 1981) (identifying the PHOSITA as a “fictitious person”); *see also* Dan L. Burk, *The Role of Patent Law in Knowledge Codification*, 23 *BERKELEY TECH. L.J.* 1009, 1025 (2008) (“[T]he PHOSITA is a fictional composite, a conceptual construct imagined for the purpose of assessing the claimed invention against its technological antecedents.”).

43. The PHOSITA standards associated with various patent law doctrines are not necessarily identical due to both differences in statutory language and doctrinal goals, but are nevertheless sometimes considered equivalent. *See, e.g., Hughes Aircraft Co. v. Gen. Instrument Corp.*, 374 F. Supp. 1166, 1179 n.1 (D. Del. 1974) (“[T]he definition of the person skilled in the art is the same whether the issue is patentability, 35 U.S.C. § 103, or as here, adequacy of the specification, 35 U.S.C. § 112.”); Jesse S. Keene, *Fact or Fiction: Reexamining the Written Description Doctrine's Classification as a Question of Fact*, 18 *FED. CIR. B.J.* 25, 53 (2008) (“[T]he two [PHOSITA] standards [of § 103 and § 112] are widely considered to be the same.”); *see also infra* note 96 and sources cited therein. Although the better view is that the various PHOSITA standards are not identical, the ideas developed in this Note clearly have implications beyond § 103.

44. 35 U.S.C. § 112 (2006).

45. *See* Burk & Lemley, *supra* note 36, at 1186–87 (noting the PHOSITA standard's relevance to definiteness, enablement, best mode, claim construction, and the doctrine of equivalents).

C. The Neglected Dimension of the PHOSITA Standard

Despite its critical relevance to patent law,⁴⁶ the PHOSITA standard has been the subject of only a modest amount of scholarship and judicial attention.⁴⁷ That attention almost invariably focuses on one of two dimensions: (1) the level of skill of the PHOSITA;⁴⁸ or (2) the scope of analogous art of which the PHOSITA is presumed to be aware.⁴⁹ Quite sensibly, the higher the level of skill that a PHOSITA possesses, the more likely that a given variation from the prior art could be achieved by that PHOSITA.⁵⁰ Similarly, the larger the num-

46. James B. Gambrell & John H. Dodge, II, *Ordinary Skill in the Art: An Enemy of the Inventor or a Friend of the People?*, in NONOBVIOUSNESS, *supra* note 21, at 5:303 (“The determination of the level of ordinary skill in the art is of course, central to the entire evaluation of whether a new and useful invention should or should not be given patent protection.”); Mandel, *supra* note 3, at 71–72 (explaining that the PHOSITA standard is a “critical factual inquir[y]” that has not been precisely defined by courts); J. Peter Paredes, *Written Description Requirement in Nanotechnology: Clearing a Patent Thicket?*, 88 J. PAT. & TRADEMARK OFF. SOC’Y 489, 494 (2006) (“[T]he PHOSITA-based analysis calibrates all the legal principles under the written description requirement.”).

47. *See* Burk & Lemley, *supra* note 36, at 1202 (“Courts should . . . spend more time and effort fleshing out the PHOSITA . . .”); Eisenberg, *supra* note 35, at 889 (“Judicial decisions have assigned a far lesser role to PHOSITA in evaluating nonobviousness than one might expect . . .”); Joseph P. Meara, *Just Who Is the Person Having Ordinary Skill in the Art? Patent Law’s Mysterious Personage*, 77 WASH. L. REV. 267, 268 (2002) (noting that “this critical factual inquiry has received comparatively little attention from the Federal Circuit”).

Recently, and particularly since *KSR*, interest in the PHOSITA standard has increased in both judicial opinions and scholarly commentary. *See* Sean B. Seymore, *The Enablement Pendulum Swings Back*, 6 NW. J. TECH. & INTELL. PROP. 278, 286 (2008) (“[T]he Federal Circuit’s post-*KSR* opinions devote more attention to the PHOSITA.”). A Westlaw search performed on October 19, 2009 in the “jlr” (all journals and law reviews) database for the term “phosita” returned 194 results, 63 (32%) of which were dated from either 2008 or 2009, and only ten of which were dated prior to 2000. Expanding the search to “phosita or ‘person having ordinary skill in the art’” produced 1307 results, 478 (37%) of which were dated prior to 2000.

48. *See, e.g.*, *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696 (Fed. Cir. 1983) (listing factors to be considered in determining level of ordinary skill); Mandel, *supra* note 3, at 71–80 (criticizing the undefined level of ordinary skill); Joseph Scott Miller, *Level of Skill and Long-Felt Need: Notes on a Forgotten Future*, 12 LEWIS & CLARK L. REV. 579, 582 (2008) (“[W]e should [use] evidence of long-felt, unmet need in an art . . . in determining the level of skill in that art.”).

49. *See, e.g.*, *State Contracting & Eng’g Corp. v. Condotte Am., Inc.*, 346 F.3d 1057, 1069 (Fed. Cir. 2003) (explaining that art “is analogous if it is from the same field of endeavor as the invention” or “reasonably pertinent to the particular problem with which the inventor is involved” (quoting *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992))) (internal quotation marks omitted); *Clay*, 966 F.2d at 658–59 (setting forth criteria for determining whether art is analogous). *See generally* Lance Leonard Barry, *Cézanne and Renoir: Analogous Art in Patent Law*, 13 TEX. INTELL. PROP. L.J. 243 (2005) (providing an overview of the concept of analogous art). The scope of what is considered relevant or analogous art has expanded in recent decades. *See* *Geo. J. Meyer Mfg. Co. v. San Marino Elec. Corp.*, 422 F.2d 1285, 1288 (9th Cir. 1970) (analogous art encompasses more than in the past); *Innovative Scuba Concepts, Inc., v. Feder Indus., Inc.*, 819 F. Supp. 1487, 1503 (D. Colo. 1993) (noting trend toward expansive definition of analogous art).

50. *Environmental Designs* sets forth six nonexclusive factors that courts may consider when establishing an appropriate level of skill for the PHOSITA:

ber of references that a PHOSITA is presumed to have read and understood, the more likely it is that a given invention will be obvious in light of those references.⁵¹

Generally neglected in discussions of the PHOSITA standard, however, is any inquiry into what it is that the PHOSITA does. While two individuals might be working in the same field or art, the particular role each plays may result in vastly different perspectives from which to judge obviousness.⁵² For example, a PHOSITA working in the art of two-wheeled human-powered transportation could be conceived of as one whose profession it is to: (1) ride a bicycle, (2) build a bicycle, (3) design a bicycle, or (4) invent new technology for bicycles. Case law has established that using a product (category (1)) is not the appropriate conception of the PHOSITA's art.⁵³ Thus, whether a particular improvement in gear shifting is obvious will generally not be determined based on the perspective of a professional bicycle racer. For over one hundred years, producing or making a product (category (2)) characterized the PHOSITA's art.⁵⁴ Recently, however, without any apparent deliberate effort or conscious awareness, the applied PHOSITA standard has begun to blur into categories (3) and (4).⁵⁵ This unacknowledged, tectonic shift in the conception of what the PHOSITA does has significant implications for innovation policy.

Factors that may be considered in determining level of ordinary skill in the art include: (1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.

713 F.2d at 696; *see also* Daiichi Sankyo Co. v. Apotex, Inc., 501 F.3d 1254, 1256 (Fed. Cir. 2007) (quoting the *Environmental Designs* factors and noting that they are "not exhaustive").

51. *See In re Clay*, 966 F.2d at 658 (noting that "the scope and content of the prior art" is relevant to a determination of obviousness).

52. *See In re Laverne*, 356 F.2d 1003, 1006 (1966) (distinguishing "between the craftsman or routinier on the one hand and the innovator on the other," but insisting that "these two categories of persons are workers in the same 'art'"), *abrogated by In re Nalbandian*, 661 F.2d 1214 (C.C.P.A. 1981).

53. *I.U. Tech. Corp. v. Research-Cottrell, Inc.*, 641 F.2d 298, 303 (5th Cir. 1981) ("With uniformity the cases adhere to the view that it is . . . not the user of the solution who must be the focus of inquiry."); *Systematic Tool & Mach. Co. v. Walter Kidde & Co., Inc.*, 555 F.2d 342, 348 (3d Cir. 1977) (explaining that the PHOSITA is "not the user of the solution"). This line of cases suggests that the PHOSITA in *Graham* is not the farmer. *See supra* note 3. *See also* John O. Tresansky, *PHOSITA — The Ubiquitous and Enigmatic Person in Patent Law*, 73 J. PAT. & TRADEMARK OFF. SOC'Y 37, 40 (1991).

54. *See infra* Part III.A.

55. *E.g.*, *Judin v. United States*, 27 Fed. Cl. 759, 769 (Fed. Cl. 1993) (accepting defendant's characterization of the art as "optical design" rather than plaintiff's suggestion of "optical physics," and marginalizing the dispute as a "disagreement over the exact name of the relevant art").

III. THE DRIFTING DEFINITION OF “ART”: 1790–PRESENT

The PHOSITA's art can be thought of as comprising two dimensions: (1) the field or discipline in which the PHOSITA is working, and (2) the nature of the PHOSITA's activity within that field. Freed by an absence of scholarly or judicial attention, the understanding of this second dimension of art has drifted gradually over the years. Much as language itself diverges over time to produce mutually incomprehensible tongues, incremental changes in the judicial understanding of art have accumulated to such an extent that the PHOSITA standard is now an unrecognizable descendant of *Hotchkiss*'s “ordinary mechanic.” This evolution has occurred in the absence of the expressed intent of Congress and deliberate policy crafting by the judiciary. Since the first American patent statute, the PHOSITA has evolved from an ordinary mechanic to an ordinary designer and finally to an ordinary researcher.

A. *The Mechanic: 1790s–1970s*

During most of the history of the nation, the PHOSITA standard — which did not exist as such — might accurately have been characterized by the expression “ordinary mechanic in the trade.” From the earliest patent decision of the 1800s through the 1960s, arts were generally regarded as stable fields of endeavor in which ordinary effort would produce expected results.⁵⁶ As distinct from the manual skills of the artisan or ordinary mechanic, the work of the inventor required “an effort of the brain as well as the hand.”⁵⁷ An art, in other words, was a trade,⁵⁸ and the person who practiced the art would have been designated an artisan, workman, manufacturer, or mechanic. As noted above, *Hotchkiss* established the obviousness bar as requiring more than that which could be accomplished by “an ordinary mechanic acquainted with the business.”⁵⁹ A 1908 Third Circuit formulation of the PHOSITA equivalent described an “ordinary workman

56. See *infra* notes 58–68 and accompanying text. In the context of patentable subject matter, the Federal Circuit has rejected the assertion that “art” is somehow broader than “process”; that is, an art is a series of steps. See *In re Nuijten*, 500 F.3d 1346, 1354–55 (Fed. Cir. 2007); see also *Cochrane v. Deener*, 94 U.S. 780, 788 (1876) (“[An art] is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.”).

57. *Northrup v. Adams*, 18 F. Cas. 374, 374 (C.C.E.D. Mich. 1877) (No. 10,328). The quoted language from *Northrup* appeared in twenty-nine other cases between 1877 and 1954, including the Supreme Court case of *Smith v. Whitman Saddle Co.*, 148 U.S. 674, 679 (1893), but in only one decision between 1955 and 2009. See *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F.3d 665, 673 (Fed. Cir. 2008).

58. See SAMUEL JOHNSON, *DICTIONARY OF THE ENGLISH LANGUAGE* (London, Rivington 1790); EDWARD C. WALTERSCHEID, *THE NATURE OF THE INTELLECTUAL PROPERTY CLAUSE 126* (2002) (“In 1787 ‘useful arts’ meant basically helpful or valuable trades.”).

59. *Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248, 267 (1850).

possessed of the usual mechanical skill.”⁶⁰ Further support is provided by a notable dictionary of the time, which defined “artisan” as a “manufacturer; low tradesman.”⁶¹

The PHOSITA was thus a tradesman — a person who practiced his art with ordinary skill but who was not an inventor.⁶² Case law confirms this view of the artisan or mechanic as engaged in the manufacture or repetitive treatment of a product. In the 1818 case of *Evans v. Eaton*,⁶³ for example, the Supreme Court spoke of the “art of manufacturing flour.”⁶⁴ The following decade, Justice Story described “the art of making leather tubes or hose, for conveying air, water, and other fluids.”⁶⁵ Numerous other cases spanning two centuries use parallel language for other arts, such as the “art of manufacturing bricks and tiles,”⁶⁶ the “art of making garments,”⁶⁷ and the “art of making lead pipe.”⁶⁸

Arts, of course, evolved over time as new processes, compositions, and devices were discovered that could improve the arts in some way. Such improvements, however, did not originate from ordinary artisans merely practicing their art in the usual manner. In contrast to the usual works of the artisans, courts and scholars characterized inventions as reflecting genius⁶⁹ or extraordinary skill.⁷⁰

60. *Brunswick-Balke-Collender Co. v. Rosatto*, 165 F. 56, 58 (3d Cir. 1908) (quoting *Brunswick-Balke-Collender Co. v. Rosatto* 159 F. 729 (C.C.E.D. Pa. 1908)).

61. JOHNSON, *supra* note 58, at 22.

62. *See* ROBINSON, *supra* note 27, at 176 (discussing the “imitative faculties” of the PHOSITA).

63. 16 U.S. (3 Wheat) 454 (1818).

64. *Id.* at 506; *see also* *Evans v. Jordan*, 13 U.S. (9 Cranch) 199, 202 (1815) (referring to the “art of manufacturing flour and meal”).

65. *Pennock v. Dialogue*, 27 U.S. (2 Pet.) 1, 14 (1829).

66. *Wood v. Underhill*, 46 U.S. (5 How.) 1, 4 (1847).

67. *Cluett v. Clafin*, 140 U.S. 180, 182 (1891).

68. *O’Reilly v. Morse*, 56 U.S. (15 How.) 62, 117 (1853); *see also* *Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 805 (1988) (“rifle-making art”); *Keystone Mfg. Co. v. Adams*, 151 U.S. 139, 145 (1894) (“art of cornshelling”); *Royer v. Coupe*, 146 U.S. 524, 526 (1892) (“art of tanning and curing hides”); *Int’l Tooth-Crown Co. v. Gaylord*, 140 U.S. 55, 60 (1891) (“art of making and applying this tooth crown”); *New Process Fermentation Co. v. Maus*, 122 U.S. 413, 420 (1887) (“art of brewing beer”); *White v. Dunbar*, 119 U.S. 47, 49 (1886) (“art of preserving shrimps in metal cans”); *Bauer Bros. Co. v. Bogalusa Paper Co.*, 96 F.2d 991, 994 (5th Cir. 1938) (“art of papermaking”).

More recent case law tends to blur manufacturing activities with inventive activities. *See* *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (“art of MRI technology”); *SRI Int’l Inc. v. Internet Sec. Sys., Inc.*, 456 F. Supp. 2d 623, 631 (D. Del. 2006) (“art of intrusion detection technology”), *vacated in part*, 511 F.3d 1186 (Fed. Cir. 2008); *Messerschmidt v. United States*, 29 Fed. Cl. 1, 32 (Fed. Cl. 1993) (“art of helicopter control system technology”).

69. *See, e.g.*, *Eldred v. Ashcroft*, 537 U.S. 186, 227 (2003) (quoting *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984)) (characterizing intellectual property as a reward for “genius”); *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 15 n.7 (1966) (collecting cases and noting that judicial reference to “flash of creative genius” was a “rhetorical embellishment of language going back to 1833”); *Mantle Lamp Co. v. Aluminum Prods. Co.*, 301 U.S. 544, 546 (1937) (characterizing the standard for patentability as involving “inventive genius”); *Potts v. Creager*, 155 U.S. 597, 607 (1895) (indicating “intui-

The characterization of the PHOSITA as a tradesperson, as distinct from a researcher, persisted well into the 1900s. As late as the 1950s, courts still commonly described the PHOSITA as an ordinary workman or mechanic,⁷¹ and “arts” as involving the making or producing of a product.⁷² According to one commentator, the Supreme Court’s 1966 decision in *Graham v. John Deere Co.*⁷³ “made it reasonably clear that the *Hotchkiss* mechanic and [the PHOSITA] were closely related if not identical.”⁷⁴ Yet even before *Graham*, the conception of the PHOSITA as a “mechanic” was on the decline. Figure 2 traces the conception of the PHOSITA as a “mechanic” from the 1840s to the present.⁷⁵

tive genius” as “a characteristic of great inventors”); *Reckendorfer v. Faber*, 92 U.S. 347, 357 (1875) (noting that all cases recognize “the distinction between mechanical skill . . . and inventive genius”); *see also* *Woodworth v. Sherman*, 30 F. Cas. 586, 589 (C.C.D. Mass. 1844) (No. 18,019) (referring to “genius” of inventor); *Gray v. James*, 10 F. Cas. 1015, 1018 (C.C.D. Pa. 1817) (No. 5,718) (stating that a patent disclosure must enable “any person skilled in the art” to make and use the invention without “taxing his genius or his inventive powers”).

70. *See* *N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1580 (Fed. Cir. 1993) (Rader, J., dissenting) (“[I]nventors generally have extraordinary skill”); Dan L. Burk, *Feminism and Dualism in Intellectual Property*, 15 AM. U. J. GENDER SOC. POL’Y & L. 183, 189–90 (2007) (distinguishing inventor from artisan as being one “one of extraordinary skill”); *see also* *Tresansky*, *supra* note 53, at 40 (“[I]nventors as a class possess something which sets them apart from workers of ordinary skill.”).

71. *See, e.g.*, *Graham v. Jeoffroy Mfg., Inc.*, 206 F.2d 769, 771 (5th Cir. 1953).

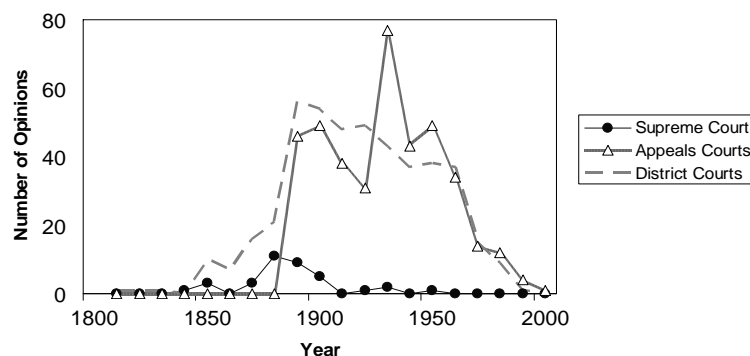
72. *See, e.g.*, *United States v. E.I. du Pont de Nemours & Co.*, 353 U.S. 586, 594 n.12 (1957) (referring to the “art of paint making”); *Hartford-Empire Co. v. United States*, 323 U.S. 386, 430 (1945) (referring to the “glassmaking art”).

73. 383 U.S. 1 (1966).

74. *Gambrell & Dodge*, *supra* note 46, at 5:316. It should be noted that *Hotchkiss* did not merely prohibit the granting of patents on inventions that would have been “obvious” to an ordinary mechanic. Instead, the *Hotchkiss* bar was broader, applying also to inventions that, even if not obvious, did not require “more ingenuity and skill” than that possessed by an ordinary mechanic. *Id.* As stated *supra* note 26, neither the word “obvious” nor its variants appear in the majority opinion.

75. Figure 2 data are based on a search of the Westlaw ALLFEDS database on September 24, 2009 using the search: (ordinary ordinarily) /5 skill! /9 (mechanical mechanic) /p (invent! patent infringe!). Because § 103 did not exist until 1952, the words on which the PHOSITA standard is based are not perfect search terms. Moreover, a large majority of patent opinions do not discuss the PHOSITA at all, and opinions that mention the PHOSITA often do not grapple with the nature of the activity in which the PHOSITA is engaged. The present search is therefore intended to illuminate the relatively small percentage of opinions which are relevant to the issue at hand. Even opinions which include the searched terms do not guarantee that the judges in those opinions actually conceived of the PHOSITA in a certain manner. Thus, the data presented is intended to graphically illustrate the general trend in the shifting PHOSITA conception but does not purport to measure this trend with precision. Individual cases were examined to ensure that the searched terms were used in the appropriate context, and nonresponsive opinions were excluded. The remaining figures should also be understood in light of similar considerations.

Figure 2: PHOSITA as Ordinarily Skilled Mechanic



Supreme Court cases that describe the PHOSITA as a mechanic of ordinary skill span from 1846 until 1950.⁷⁶ Appeals court decisions⁷⁷ conceiving of the PHOSITA as an ordinarily skilled mechanic first appeared in the 1890s and rose to a peak in the 1930s. From the 1950s to the present, there has been a dramatic decline in the characterization of the PHOSITA as an ordinarily skilled mechanic: the number of cases containing the searched language, from courts at all levels, dropped to near zero during the period from 2000 to 2009. The decline is particularly noteworthy given the rapid increase in the number of reported patent decisions during the last two decades.⁷⁸

B. The Designer: 1950s–Present

Just as the image of the PHOSITA as an ordinarily skilled mechanic was fading, a new image was rising to take its place. Beginning in the 1950s, some courts and commentators began conceiving of the PHOSITA not as a mechanic using primarily the skills of the hand but rather as a professional designer whose work required a signifi-

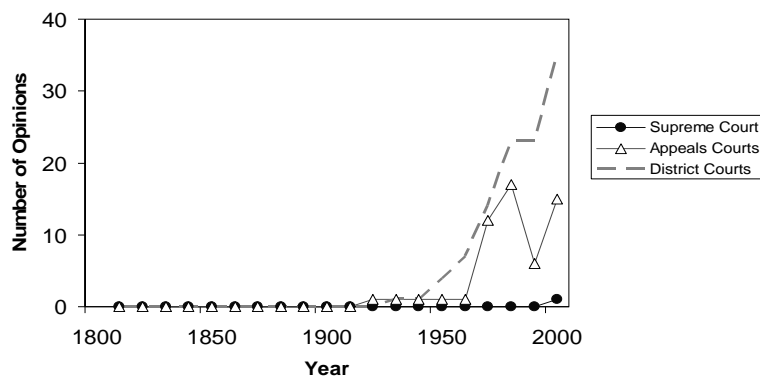
76. See *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 151 n.6 (1950) (quoting *McClain v. Ortmyer*, 141 U.S. 419, 427 (1891)); *Woodworth v. Wilson*, 45 U.S. (4 How.) 712, at 716 (1846). Data has been binned by decade, and each data point in Figures 2–6 is spatially located at the midpoint of each bin.

77. Cases from the Court of Customs & Patent Appeals and the Court of Claims were included in “Appeals Courts” data.

78. See ADAM B. JAFFE & JOSHUA LERNER, *INNOVATION AND ITS DISCONTENTS* 13–14 (2004) (depicting the dramatic increase, beginning around 1991, in the number of patent suits filed); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 348 (2003) (same). Data regarding the annual number of patent cases filed is maintained by the Administrative Office of the U.S. Courts. See Office of Judges Programs Statistics Division, *Statistical Tables for the Federal Judiciary*, <http://www.uscourts.gov/stats/index.html> (last visited Dec. 20, 2009).

cant effort of the brain.⁷⁹ Figure 3 traces the emerging conception of the PHOSITA as a designer within a given field.⁸⁰

Figure 3: PHOSITA as Designer



As reflected in Figure 3, only a handful of cases prior to the 1950s utilized the term “designer” in the context of the PHOSITA.⁸¹ Beginning in the 1950s and 1970s, district courts and appeals courts, respectively, increasingly began to conceive of the PHOSITA as a designer.⁸² This trend has generally continued to the present and includes *KSR*, the first Supreme Court case to conceive of the PHOSITA’s art as “design.”⁸³

C. The Researcher: 1970s–Present

As the PHOSITA’s art drifted from ordinarily skilled manual labor in a given field to ordinarily skilled design in that field, the stage was set for the final step of the transformation. Only in the last ten years has that final step — conceiving of the PHOSITA as a profes-

79. Probably not coincidentally, this same decade marks the end of references to the hand/brain language of *Northrup*. See *supra* note 57.

80. Data is based on a search of the Westlaw ALLFEDS database on September 24, 2009 using the search: (ordinary ordinarily) /5 skill! /9 (design!) /p (invent! patent infringe!) % “design patent.” Individual cases were examined to ensure that the searched terms were used in the appropriate context, and nonresponsive opinions were excluded.

81. See, e.g., *Parsons v. United States*, 75 Ct. Cl. 751, 760 (Ct. Cl. 1932).

82. Since the number of patent cases has increased dramatically since the early 1990s, see *supra* note 77, some of the increase in the utilization of the term “designer” may simply reflect this increased volume of relevant case law. See normalized data, presented *infra* at Figure 6.

83. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 424 (2007) (referring to a “pedal designer of ordinary skill”). Four Supreme Court cases spanning from 1883 to 1925 utilized the phrase “ordinary mechanical or engineering skill” (emphasis added) in the context of the PHOSITA standard. See, e.g., *Atl. Works v. Brady*, 107 U.S. 192, 200 (1883).

sional researcher — been taken with any frequency.⁸⁴ In a 1979 opinion, the District Court for the Southern District of New York mentioned the concept of the PHOSITA as a researcher, but this concept was not discussed and did not have a discernible effect on the outcome of the case.⁸⁵ A 1982 case in the District Court for the District of Delaware rejected the defendant's contention that a team of DuPont researchers defined the PHOSITA standard.⁸⁶ Nine years later, however, the same judge found that “the level of ordinary skill in the art in this case involves the research and development of beta-blockers,”⁸⁷ though he still conceived of the PHOSITA as an individual researcher rather than as a research team.⁸⁸

84. This statement is based on a search of the Westlaw ALLFEDS database on September 24, 2009 using the search: (ordinary ordinarily) /5 skill! /9 (research!) /p (invent! patent infringe!). Individual cases were examined to ensure that the searched terms were used in the appropriate context, and non-responsive opinions were excluded.

85. Warner-Jenkinson Co. v. Allied Chem. Corp., 477 F. Supp. 371, 393 (S.D.N.Y. 1979) (rejecting plaintiff's argument that a food coloring invention would have been obvious to one of “ordinary skill in the art of color research”).

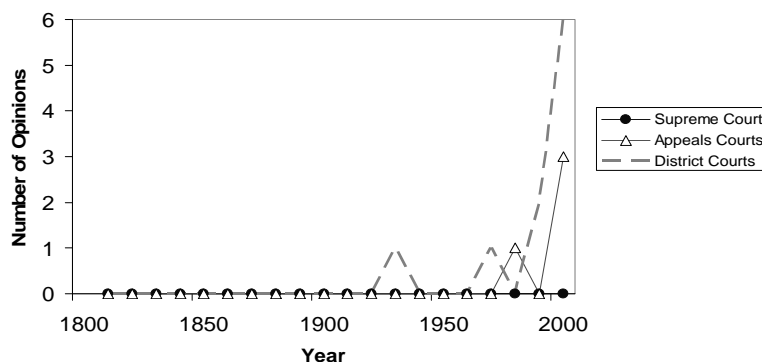
86. Studiengesellschaft Kohle mbH v. Dart Indus., Inc., 549 F. Supp. 716, 727, 735 (D. Del. 1982).

87. Imperial Chem. Indus., PLC v. Danbury Pharmacal, Inc., 777 F. Supp. 330, 352 (D. Del. 1991).

88. *Id.* Conceptions of the PHOSITA as a team or group rather than an individual have occasionally entered the literature. See Meara, *supra* note 47, at 293 (arguing that the PHOSITA standard should in some cases be based on hypothetical knowledge of “interdisciplinary teams”); Merges, *supra* note 40, at 15 (describing the PHOSITA as a “roomful of engineers”). Because the PHOSITA provides an intentionally and artificially created frame of reference, conceiving of the PHOSITA as an unrealistic amalgam of persons is appropriate in some cases. See *infra* Part V.

Although several other references were made to the PHOSITA as a researcher prior to 2000, the concept did not gain momentum until the turn of the millennium, after which it has appeared repeatedly in both lower court⁸⁹ and Federal Circuit⁹⁰ opinions. Figure 4 traces the recent emergence of the PHOSITA-as-researcher characterization.

Figure 4: PHOSITA as Researcher

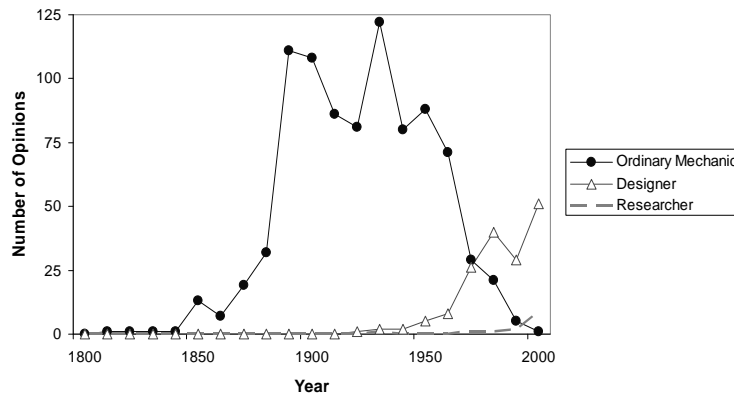


89. *See, e.g.*, *Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys.*, 563 F. Supp. 2d 1016, 1034 (N.D. Cal. 2008) (describing the PHOSITA as “[a] medical doctor working on clinical HIV research . . . or a Ph.D. researcher working on molecular methods relating to clinical HIV research”), *vacated*, Nos. 2008-1509 & 2008-1510, 2009 WL 3110809 (Fed. Cir. Sept. 30, 2009); *Alza Corp. v. Mylan Labs., Inc.*, 310 F. Supp. 2d 610, 629 (D. Vt. 2004) (referring to the PHOSITA as comprised of “artisans of ordinary skill in their research and experimentation”); *Upsher-Smith Labs., Inc. v. Pan Am. Labs., Inc.*, No. 01-352ADMAJB, 2003 WL 22999551, at *7 (D. Minn. Dec. 19, 2003) (describing the PHOSITA as “a person possessing ordinary skill in vitamin supplements research”); *Roche Diagnostics Corp. v. Selfcare Inc.*, 233 F. Supp. 2d 1038, 1065 (S.D. Ind. 2002) (noting material question of fact of whether the PHOSITA was an innovative researcher), *vacated in part & reh’g granted*, *Roche Diagnostics Corp. v. Bayer Corp.*, 247 F. Supp. 2d 1065 (S.D. Ind. 2003); *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, No. IP 99-38-C H/K, 2001 WL 1397304, at *8 (S.D. Ind. Oct. 29, 2001) (noting testimony regarding a “researcher of ordinary skill”).

90. *In re Kubin*, 561 F.3d 1351, 1357 (Fed. Cir. 2009) (describing the PHOSITA as a “researcher of ordinary skill”); *Takeda Chem. Indus., Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1358 (Fed. Cir. 2007) (explaining that “researchers would have been dissuaded [from the invention]”); *Eli Lilly & Co. v. Teva Pharms. USA, Inc.*, No. 05-1044, 2005 WL 1635262, at *4 (Fed. Cir. July 13, 2005) (noting district court’s conclusion that research clinicians were not PHOSITAs); *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004) (referring to “physicians in homocysteine research, i.e., persons of ordinary skill in the art”).

If cases from all levels (district courts, appeals courts, and the Supreme Court) and from each category (mechanic, designer, and researcher) are integrated into a single figure, the evolving conception of the PHOSITA becomes clear (Figure 5). The increase in the “designer” and “researcher” conceptions mirrors the decrease in the “mechanic” conception.

Figure 5: Comparing the Mechanic, Designer, and Researcher Conceptions



Although the designer and researcher conceptions have risen in absolute terms while the mechanic conception has fallen, these figures must be understood in the context of the rapidly increasing volume of patent cases within the past twenty years.⁹¹ If the data are normalized by placing the figures above in the numerator, and placing the total number of patent cases discussing the PHOSITA in the denominator,⁹² the resulting graph appears as presented in Figure 6.

91. See *supra* note 78.

92. Denominator values are based on a search of the Westlaw ALLFEDS database on October 10, 2009 using the search: (ordinary ordinarily) /5 skill! /p (invent! patent infringe!) & da(aft 1899 & bef 1910). The search was repeated for each ten-year period by altering the date portion of the search string.

Figure 6: Normalized Data

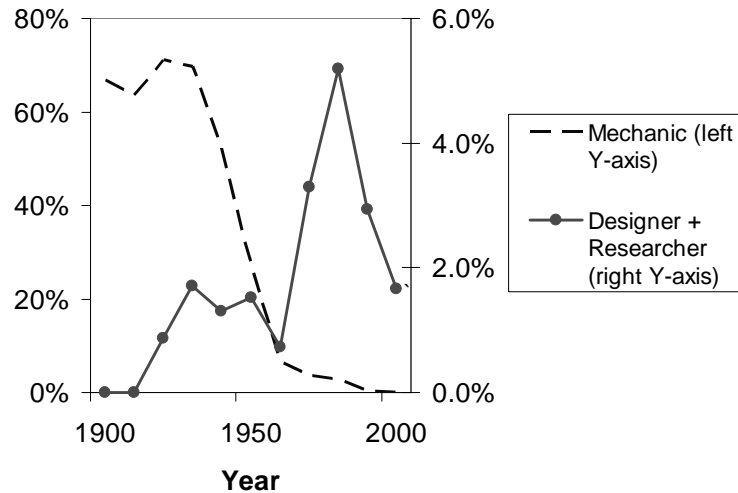


Figure 6 confirms the declining characterization of the PHOSITA as a mechanic over the period of 1920 to the present. However, although the combined designer and researcher conceptions generally increased from the 1920s through the 1980s, the explosion of patent cases since 1990 led to an overall reduction in the normalized figures since 1990. The result is that a large majority of patent cases over the past decade failed to characterize the PHOSITA as a mechanic, designer, or researcher. One possible explanation for this observation is that § 103, as well as *Graham*'s interpretation thereof, has diverted attention away from the activity in which the PHOSITA is engaged,⁹³ essentially reducing "art" to a one dimensional term that is synonymous with "field."⁹⁴ As a result, courts have increasingly referred to the PHOSITA without any specifying language as to the PHOSITA's activities within that field.

IV. JUSTIFYING A RETURN TO THE TRADITIONAL PHOSITA STANDARD

The mere observation that the judicial conception of the PHOSITA has drifted surreptitiously from "mechanic" to "researcher"

93. See *infra* Part IV.A.

94. See, e.g., *Sparton Corp. v. United States*, No. 92-580 C, 2009 WL 2948555, at *7 (Fed. Cl. Aug. 26, 2009, reissued Sept. 10, 2009) (undertaking to "define the level of ordinary skill in the sonobuoy art").

does not necessarily imply that such a change is undesirable. Indeed, it is often noted that as the state of an art advances, the bar for patentability must be raised. The Supreme Court endorsed this general approach in *KSR*, endowing the PHOSITA with ordinary creativity and stating that “as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws.”⁹⁵

In the context of the PHOSITA, raising the patentability bar may take the form of an increased skill level, a broader definition of analogous art, or a change in perspective from mechanic to researcher.⁹⁶ While all of these phenomena have been occurring, it is only the last one — the drift in perspective from mechanic to researcher — that is problematic. Skill levels can be expected to rise as longer life spans and increased specialization allow workers to accumulate greater skill at a given task. Similarly, as patents expire and scientific papers are published, the increased base of knowledge that is freely available to the public justifies an expanded scope of relevant prior art.

Yet even if the PHOSITA standard must keep pace with rising skill levels and greater volumes of prior art, several considerations caution against re-characterizing the PHOSITA as a researcher rather than as a skilled mechanic of a generally stable art. First, the observed drift in the understanding of the PHOSITA’s art has taken place largely without deliberate intention or thoughtful analysis, owing largely to Supreme Court precedent which draws attention away from the PHOSITA’s perspective and toward the singular variable of skill level. Second, conceiving of the PHOSITA’s art as “research” represents a fundamental departure from the traditional conception of art that has characterized the patent system since its inception. Third, and most importantly, denying patentability to inventions that are obvious to an ordinary researcher conflicts with patent policy unless it is assumed that research will take place even in the absence of the patent incentive. The “researcher” conception therefore threatens to reduce incentives to invent. These three lines of reasoning are explored below.⁹⁷

95. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007).

96. This three-part analysis posits that “perspective” extends beyond mere skill level or breadth of knowledge. The word “perspective” here is used in a broad sense appropriate to the language of § 103 and might vary based on habits of evaluating problems, thinking about solutions, and synthesizing disparate pieces of information to arrive at meaningful conclusions, as well as other factors.

97. A redefinition of “art” that excludes professional researchers also benefits the disclosure function of the patent system by requiring a higher standard of disclosure. Although the enablement “P[HO]SITA” of § 112 is not quite the same as the § 103 PHOSITA, *see* Burk & Lemley, *supra* note 36, at 1205, a redefinition of “art” as proposed herein could be applied to both standards. An invention is sufficiently enabled if the § 112 PHOSITA would be able to make and use the invention without “undue experimentation.” *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1344–45 (Fed. Cir. 2005). Because the amount of experimentation considered reasonable is likely to be higher for a researcher, whose occupa-

A. *The Shift to “Researcher” Has Not Been Made Deliberately*

In 1966, the Supreme Court in *Graham v. John Deere* constructed a framework that continues to control the obviousness inquiry today. That framework transformed the language of § 103 into a three-part inquiry: “Under § 103, [1] the scope and content of the prior art are to be determined; [2] differences between the prior art and the claims at issue are to be ascertained; [3] and the level of ordinary skill in the pertinent art resolved.”⁹⁸ Unfortunately, this subtle rephrasing of § 103 draws excessive attention to the PHOSITA’s skill level and obfuscates the broader requirement of § 103 that obviousness be determined from the PHOSITA’s perspective.⁹⁹ Lower courts have obediently complied with the Supreme Court’s command to resolve the PHOSITA’s skill level as a distinct and somewhat isolated inquiry.¹⁰⁰

Unfortunately, the requirement that the PHOSITA’s perspective rather than level of skill alone be the focal point of the inquiry is indicated only by the word “to”¹⁰¹ and by the grammatical structure of

tion is based on experimentation, than it is for the ordinary producer who has little time to devote to research, restoring the PHOSITA standard to producing rather than researching would raise the enablement bar. Raising the bar would in turn encourage more complete and useful disclosures, the lack of which has often characterized patents and reduced their usefulness in disseminating information. *See* *Brenner v. Manson*, 383 U.S. 519, 534 (1966) (noting “the highly developed art of drafting patent claims so that they disclose as little useful information as possible”); Note, *The Disclosure Function of the Patent System (Or Lack Thereof)*, 118 HARV. L. REV. 2023–26 (2005) (providing three reasons “why patent disclosures are very rarely a useful source of information for research and development,” including “inadequate disclosure”). *See generally* Sean B. Seymore, *Heightened Enablement in the Unpredictable Arts*, 56 UCLA L. REV. 127 (2008) (advocating a heightened enablement standard).

98. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966). Secondary considerations, which derive from case law rather than from the explicit language of § 103 constitute a fourth part of the *Graham* test. *See id.* at 17–18.

99. *See* *Gen. Motors Corp. v. Toyota Motor Co.*, 467 F. Supp. 1142, 1171 (S.D. Ohio 1979) (defining the inquiry as “how an average practitioner . . . would reason if given a problem (i.e., the motivations, methodologies, and predispositions which an average practitioner would bring to bear on the problem)”) (emphasis omitted). One commentator notes that, while courts have sometimes evaluated the PHOSITA’s skill level, they have rarely adopted the PHOSITA’s perspective. Eisenberg, *supra* note 35, at 888 (stating that judicial treatment of the PHOSITA “excludes from consideration the judgment, intuition and tacit knowledge of ordinary practitioners”). If, as it appears, judges already find it difficult to adopt the perspective of the “mechanic” PHOSITA, it may be even more difficult for them to adopt the perspective of the “researcher” PHOSITA.

100. *See, e.g., In re Mettke*, 570 F.3d 1356, 1359 (Fed. Cir. 2009); *Litton Sys., Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1568 (Fed. Cir. 1996) (separate section entitled “Level of Ordinary Skill”), *vacated*, 520 U.S. 1111 (1997); *Candela Corp. v. Palomar Med. Techs., Inc.*, No. 9:06-CV-277, 2008 WL 3285255, at *2 (E.D. Tex. Aug. 6, 2008) (separate section entitled “One of Ordinary Skill”).

101. *See* 35 U.S.C. § 103 (2006) (“A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious . . . to a person having ordinary skill in the art . . .”) (emphasis added).

§ 103 as a whole. The Court's segmentation of the statute in *Graham* obscures this overall emphasis on perspective. It would have been truer to the plain meaning of § 103 for the Court to have defined the third obviousness inquiry differently. For example, the third part of the *Graham* framework could have required that "the skills and perspective of the PHOSITA be ascertained," rather than requiring that "the level of ordinary skill in the pertinent art [be] resolved."¹⁰² Arriving at a PHOSITA standard would of course include a skill level inquiry but would not be limited to it.¹⁰³ Commentators have occasionally urged a fuller exposition of the PHOSITA,¹⁰⁴ and the Supreme Court has recently acknowledged that a proper conception of the PHOSITA involves more than mere notions of skill.¹⁰⁵

B. A "Researcher" Conception Is a Significant Break with Traditional Patent Doctrine

As discussed in Part III.A, case law spanning two centuries conceives of "arts" as the repeated performance by artisans of given processes to yield predictable results. Thus, the Supreme Court long ago explained that "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, [and] smelting ores" are examples of "arts."¹⁰⁶ Although the artisan and researcher may work with the very same subject matter, their tasks are distinct in terms of innovation expectations. By definition, the job of a researcher is to create new, useful, and nonobvious contributions — that is, to invent. Webster's Dictionary, for example, defines research as "investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories . . . in the light of new facts [nonobviousness], or practical application [utility] of such new or revised theories [novelty] . . ."¹⁰⁷ While the overlap between patentable invention

102. See Federico, *supra* note 24, at 92–94 (explaining that the word "ordinary" had preceded the word "person" in draft legislation, but was later moved to "its proper place" (before "skill")).

103. A unanimous Supreme Court recently warned against too rigid an application of the obviousness standard. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007) ("Application of the [obviousness] bar must not be confined within a test or formulation too constrained to serve its purpose."):

104. See, e.g., Gambrell & Dodge, *supra* note 46, at 5:302 (stating that the proper patentability standard requires a "determin[ation] [of] the composite nature of [the PHOSITA] — who he is, what he knows, and how he operates"); Burk & Lemley, *supra* note 36, at 1202 ("Courts should also spend more time and effort fleshing out the PHOSITA, who in many opinions seems to be mentioned only perfunctorily."):

105. *KSR*, 550 U.S. at 421 ("A person of ordinary skill is also a person of ordinary creativity, not an automaton."):

106. *Corning v. Burden*, 56 U.S. (1 How.) 252, 267 (1853).

107. WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 1002 (1989); see also BLACK'S LAW DICTIONARY 1333 (8th ed. 2004) (defining "research and development" as "an effort . . . to create or improve products or services [utility], esp. by discovering new technology [novelty] or advancing existing technology"); cf. BLACK'S LAW DICTIONARY 118–19

and the dictionary definition of research is not exact, the general congruity between these two concepts is evidenced by the numerous patents often held by research teams.¹⁰⁸

Operating under the traditional understanding of the PHOSITA, the patent system has coexisted with the unprecedented development of technologies and even the evolution of entirely new fields of endeavor.¹⁰⁹ While it is difficult to credit the patent system for this success with any certainty, it seems unlikely that the patent system has had no impact. Today, invention occupies so central a place in the economy that it often involves large teams of highly-trained specialists with millions of dollars in funding and equipment who devote themselves full-time to the task of producing inventions.¹¹⁰ In 2008, such inventive efforts contributed to the issuance of more than 157,000 utility patents,¹¹¹ and the number of issued patents has increased by an average of approximately 6% annually for over two centuries.¹¹² Adopting a radical redefinition of the perspective from

(8th ed. 2004) (defining “art” as “the methodical application of knowledge or skill in creating something new”). The subtle but important shift from mechanic to researcher is apparent in two versions of Black’s Law Dictionary appearing half a century apart. *Compare* BLACK’S LAW DICTIONARY 1250 (4th ed. 1951) (“Ordinary skill in an art” is “[t]hat degree of skill which men engaged in that particular art usually employ; not that which belongs to a few men only, of extraordinary endowments and capacities.”), *with* BLACK’S LAW DICTIONARY 1132 (8th ed. 2004) (“[O]rdinary skill in the art” is “[t]he level of technical knowledge, experience, and expertise possessed by a typical engineer, scientist, designer, etc. in a technology that is relevant to an invention.”).

108. For example, the Mayo Clinic’s Orthopedic Research Division collectively holds “dozens of patents.” Mayo Clinic Department of Orthopedic Surgery, Overview, <http://mayoresearch.mayo.edu/ortho/> (last visited Dec. 20, 2009); *see also* Saritha Rai, *In India, A High-Tech Outpost for U.S. Patents*, N.Y. TIMES, Dec. 15, 2003, at C4 (stating that engineers at Cisco, IBM, and others “have filed more than 1,000 patent applications”).

109. *Graham v. John Deere Co.*, 383 U.S. 1, 19 (1966) (“[T]he ambit of applicable art in given fields of science has widened by disciplines unheard of a half century ago.”).

110. *See, e.g.*, Lawrence K. Altman, *Gateses to Finance H.I.V. Vaccine Search*, N.Y. TIMES, July 20, 2006, at A15 (noting the “significant shift in emphasis, to large-scale collaborative projects instead of small teams of researchers working independently”); Gardiner Harris & Kenneth Chang, *Breaker-Ready Projects? Colleges Have Quite a Few*, N.Y. TIMES, Feb. 24, 2009, at D1 (noting that a federal stimulus bill included \$2 billion in funding for National Science Foundation research grants); U.S. Dep’t of Energy, *DOE Provides \$30 Million to Jump Start Bioenergy Research Centers* (Oct. 1, 2007), <http://www.energy.gov/news/5534.htm> (noting that U.S. Dept. of Energy investment of \$30 million brings total funding to \$400 million devoted to “multidisciplinary teams of leading scientists to advance research needed to make cellulosic ethanol and other biofuels commercially viable”); *Innovation Is a Game for Team Players*, STRATEGIC DIRECTION, vol. 23(4), 2007, at 16, available at <http://www.emeraldinsight.com/Insight/viewContentItem.do?contentType=Article&contentId=1597893> (“Well functioning R&D teams are an essential part of any company’s [new product development] strategy . . .”).

111. U.S. PAT. & TRADEMARK OFF., U.S. PATENT ACTIVITY CALENDAR YEARS 1790 TO THE PRESENT, Apr. 16, 2009, http://www.uspto.gov/go/taf/h_counts.pdf.

112. Decade to decade percent growth in the number of issued utility patents has varied considerably since 1790, soaring to triple digits during several decades at the beginning and middle of the 1800s, falling to a low point during the 1920s to the 1940s, and increasing to double digits in the 1990s. *See id.*

which all patentability is based — from the perspective of one who does not seek to innovate¹¹³ to the perspective of one who does — is a step that should be taken only after deliberate reflection and analysis.

Ironically, it is the rapid advancement of technology that appears to be driving the reformulation of “art” as “research within field X.” Science as a discipline has exploded in the last half century. In the 1960s, certain scientific publications began to boast that “over 90 percent of the scientists who ever lived are alive today.”¹¹⁴ A more recent publication notes that the number of scientists, the number of members in scientific institutes, and the number of scientific journals have doubled every ten to fifteen years.¹¹⁵

As the ranks of those devoting their life’s work to “push[ing] back the frontiers of [science]”¹¹⁶ grew rapidly, it likely appeared natural to some judges to consider such a large group of people engaged in research activities to be practicing a new art for purposes of the PHOSITA standard. For example, pharmaceutical researchers have been considered to occupy a different field — thus giving rise to a separate and higher PHOSITA standard — than pharmaceutical producers or manufacturers.¹¹⁷ Pharmaceutical production, however, is more closely analogous to the traditional conception of art than is pharmaceutical research.

While easy to understand, such a shift represents a more radical departure from previous doctrine than it may initially appear. In the 1800s, the same artisan might spend time both producing and researching, generally devoting far more time to the former function than to the latter. Under these circumstances, it is easier to recognize that productive activities and research activities are two different functions within the same art. The goal of the patent system is to encourage the devotion of greater time and resources away from production and towards research.¹¹⁸ Research, however, is not an art in itself but an attempt to improve an art.

113. See *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985); Meara, *supra* note 47, at 276.

114. J. Weber, *Some Notes on Lasers: Concluding Remarks*, 122 ANNALS N.Y. ACAD. SCI. 832, 833 (1965). The earliest version of this statement appears to be contained in DEREK DE SOLLA PRICE, *LITTLE SCIENCE, BIG SCIENCE* 1 (1963).

115. SERGIO SISMONDO, *AN INTRODUCTION TO SCIENCE AND TECHNOLOGY STUDIES* 13–14 (2008).

116. *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 154 (1950) (Douglas, J., concurring).

117. See *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256–57 (Fed. Cir. 2007).

118. See generally STEVEN SHAVELL, *FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW* 140 (2004) (explaining why production activities will generally occur in the absence of intellectual property rights, but invention and development activities may not).

C. PHOSITA as “Researcher” Reduces Incentives to Invent

The fundamental flaw in conceiving of the PHOSITA's art as “research within field X” is that it assumes that research will take place even in the absence of the patent incentive. A similar problem was addressed in the context of design patents more than forty years ago, and the court's reasoning in that case provides useful insight into the present issue.¹¹⁹

1. A “Researcher” Conception Assumes that Research Will Occur Without Patents

The researcher's work, unlike that of the artisan, is characterized by uncertainty of result and delayed remuneration.¹²⁰ The patent reward functions to incentivize research and help reduce this investment risk. A fundamental assumption of the patent system and of the Constitution's Patent Clause is therefore that sufficient incentives to research do not exist in the absence of exclusive rights.¹²¹ If market or other factors were a sufficient inducement to research and develop useful inventions, the substantial costs of the patent system would be much more difficult to justify.¹²²

Today, entire departments within business organizations, and even entire organizations themselves, perform the sole function of attempting to improve a given art. If it is assumed that these professional invention centers would not exist in the absence of the patent

119. See discussion *infra* Part IV.C.2.

120. See THE OXFORD ENGLISH DICTIONARY VOL. XIII 693 (2d ed. 1989) (defining “researcher” as “[o]ne who devotes himself to scientific . . . research (esp. as contrasted with one whose time is chiefly occupied in teaching or directly remunerative work)”).

121. Challenges to this assumption have been made but need not be considered here. If it is true that the patent system is not needed to induce invention, then selecting the appropriate PHOSITA standard is irrelevant. See generally JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE (2008) (arguing that total social costs of patents have recently overtaken total social benefits in at least some sectors, but recommending reform rather than abolition). For a discussion of the history of the patent abolition movement, see Mark D. Janis, *Patent Abolitionism*, 17 BERKELEY TECH. L.J. 899 (2002); see also SUBCOMM. ON PATENTS, TRADEMARKS & COPYRIGHTS OF THE S. COMM. ON THE JUDICIARY, 85TH CONG., AN ECONOMIC REVIEW OF THE PATENT SYSTEM 80 (Comm. Print 1958) (prepared by Fritz Machlup), available at <http://www.mises.org/etexts/patentsystem.pdf> (“If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it.”); WILLIAM ARMSTRONG ET AL., RECENT DISCUSSIONS ON THE ABOLITION OF PATENTS FOR INVENTIONS IN THE UNITED KINGDOM, FRANCE, GERMANY, AND THE NETHERLANDS (1869); George L. Priest, *What Economists Can Tell Lawyers About Intellectual Property*, 8 RESEARCH L. & ECON. 19 (1986) (concluding that economics cannot definitively resolve the patent debate).

122. While other benefits of the patent system might remain — information disclosure, efficient coordination of development, investment signaling, etc. — the primary benefit of invention promotion would be greatly attenuated.

incentive, then basing the PHOSITA standard on the perspective of researchers at these centers becomes questionable. In contrast, economically useful production activities will take place regardless of the patent reward. Basing the PHOSITA standard on production activities thus provides a stable frame of reference that is not dependent on the effects of the patent system itself.

The tension in a “researcher” standard also becomes apparent upon examination of the contractual view of the patent system. Because patents enable patent holders to charge higher prices or to exclude others altogether from using or selling an invention, they impose a cost on society.¹²³ This cost, however, is justified as a *quid pro quo* for “the benefit derived by the public from an invention with substantial utility.”¹²⁴ Viewed as a contract, the patent system is a promise by the government to reward those who divert efforts from production to research and ultimately discover valuable improvements. The shift from the mechanic’s perspective to the researcher’s perspective is then analogous to a unilateral change in the contractual terms. After society has devoted vast time and resources to establishing professional research centers in pursuit of this reward, the terms of the contract are altered such that the availability of the reward depends on the perspective of “ordinary researchers,” a perspective that would not exist but for the initial enticement of the patent.

Similar reasoning may underlie an oft-quoted passage authored by Judge Rich in *Standard Oil Co. v. American Cyanamid Co.*:

A person of ordinary skill in the art is also presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate, whether by patient, and often expensive, systematic research or by extraordinary insights, it makes no difference which.¹²⁵

Professor Eisenberg has argued that Judge Rich’s reasoning is circular in that it “defin[es] nonobviousness (and therefore patentability) by reference to the skill level of PHOSITA, and then defin[es] PHOSITA’s skill level by reference to capacity to make patentable (that is, nonobvious) inventions.”¹²⁶ Such an argument, however, depends on the false premise that skill level is synonymous with per-

123. See Menell & Scotchmer, *supra* note 5, at 1477 (noting three types of economic defects associated with intellectual property rights: (1) deadweight loss to consumers; (2) interference with downstream research; and (3) the inability to ensure that the initial research effort in pursuit of the intellectual property right is efficient).

124. *Brenner v. Manson*, 383 U.S. 519, 534 (1966).

125. 774 F.2d 448, 454 (Fed. Cir. 1985).

126. Eisenberg, *supra* note 35, at 892.

spective.¹²⁷ It is true that nonobviousness is determined based on the perspective (not merely skill level) of the PHOSITA.¹²⁸ That the PHOSITA does not undertake to innovate, however, does not mean that the PHOSITA does not have the *capacity* to make patentable invention. To the contrary, a PHOSITA at any skill level may possess the capacity to innovate.

2. Lessons from Design Patent Doctrine — *In re Laverne*

To this point, the discussion has focused exclusively on the art of the utility patent PHOSITA. A particularly insightful point of comparison worth examining is the art of the design patent PHOSITA. Design patents are provided for under § 171 of the patent statute and, like utility patents, are subject to the obviousness requirement of § 103 and therefore to the PHOSITA standard. However, because Congress defines the designer's calling or art as "design," the question arises whether it is proper to deny a patent where the design in question is no more inventive than what could be expected from a person having ordinary skill in the art of design.

In 1966, the Court of Customs and Patent Appeals grappled with just this question in *In re Laverne*.¹²⁹ In that case, the court reviewed a rejection by the Patent Office Board of Appeals of an applicant's chair design. The examiner, whose decision was affirmed by the Board, had rejected the design as unpatentable, reasoning that it constituted "the sort of variation to be expected from any ordinarily skillful mechanic conversant with the art [of chair design]." To the appeals court, however, the issue was not so simple. Judge Rich, writing for the court, reversed the Board's finding of obviousness, stating: "We feel that the test of patentability of an admittedly new design cannot be

127. Judge Rich referred to skill level in the same portion of the opinion quoted above but did so to emphasize that the PHOSITA standard is a hypothetical construct, not based on any particular person. The lower court in that case had based the PHOSITA standard on the skill level of the actual inventor. Courts and commentators have generally accepted this aspect of Judge Rich's reasoning. *See, e.g.*, *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 874 (Fed. Cir. 1985), *overruled by* *Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059 (Fed. Cir. 1998); *Boeing Co. v. United States*, 69 Fed. Cl. 397, 420 (Fed. Cl. 2006); *SmithKline Beecham Corp. v. Apotex Corp.*, 2005 WL 941671, at *8 (E.D. Pa. 2005); *Yamanouchi Pharm. Co. v. Danbury Pharmacal, Inc.*, 21 F. Supp. 2d 366, 373 n.13 (S.D.N.Y. 1998); Nicholas J. Gingo, *Dumb Inventors Rejoice: How Daiichi Sankyo v. Apotex Violated the Federal Patent Statute*, 17 TEX. INTELL. PROP. L.J. 81, 96 (2008) (discussing the use by courts of the inventor's actual skill level); Mandel, *supra* note 3, at 73 (criticizing judicial reliance on the skill level of the inventor); Douglas Y'Barbo, *Is Extrinsic Evidence Ever Necessary to Resolve Claim Construction Disputes?* (pt. 1), 81 J. PAT. & TRADEMARK OFF. SOC'Y 567, 605 (1999) ("That the actual inventor's skill is irrelevant because it does not represent a person of ordinary skill is of course, bedrock patent law.")

128. 35 U.S.C. § 103 (2006).

129. *In re Laverne*, 356 F.2d 1003, 1004–05 (C.C.P.A. 1966), *abrogated by In re Nalbandian*, 661 F.2d 1214 (C.C.P.A. 1981). The C.C.P.A. is the predecessor court to the Court of Appeals for the Federal Circuit.

whether it is no more than a ‘competent designer’ might produce. *That would be parallel to saying of a mechanical invention that it is no more than a ‘competent inventor’ might produce.*¹³⁰ Just as a “competent inventor” standard would be antithetical to the purposes of § 101 (providing for utility patents), under the court’s view a “competent designer” standard would have been antithetical to the purposes of § 171 (providing for design patents). The court worried that if the standard became based on the level of skill of the ordinary designer, this would effectively “rul[e] out, as a practical matter, all patent protection for ornamental designs.”¹³¹

Via a shifting understanding of the word “art,” this problem from design patent jurisprudence has begun to suffuse utility patent jurisprudence. In order to prevent the PHOSITA’s art from undermining the purpose of the design patent statute, the *Laverne* court effectively ignored the § 103 statutory reference to the “person having ordinary skill in the art” and instead evaluated the obviousness of the design from the perspective of the “ordinary intelligent man,”¹³² a standard which was eventually discarded.¹³³ The solution with utility patents, however, is simpler.

In the utility patent context, there is also an interest in fulfilling the statutory purpose of the utility patent statute, but the solution does not require the deft maneuvering of *Laverne*. Unlike design patents, where the art is defined as design, it is a simple matter to restrict the art of the utility PHOSITA to practicing, rather than designing. Unfortunately, not only has the utility patent PHOSITA’s art begun to include design, it has now gone even further toward the unthinkable standard alluded to by Judge Rich in *Laverne*¹³⁴: the PHOSITA standard is now being defined by the professional researcher.

V. ACHIEVING THE IDEAL PHOSITA STANDARD

As noted in Part II.B, the PHOSITA standard functions as a collar on the patentability standard, ensuring that the bar is set neither too high nor too low. One might wonder whether excluding the perspective of researchers would result in an improperly low PHOSITA standard. For example, producers of automobiles may be assembly line

130. *In re Laverne*, 356 F.2d. at 1006 (emphasis added).

131. *Id.*

132. *Id.*; see also *In re Nalbandian*, 661 F.2d at 1218 (Rich, J., concurring) (explaining that the rationale of *Laverne* was to “retain[] within the ambit of the patent system the made-for-hire products of ‘competent designers’ so businessmen or corporations would find it economically advantageous to employ them, thus carrying out the objective of 35 U.S.C. § 171”); see also Arnold, *supra* note 37, at 8:6 (noting that “clients can and do ‘invent to order’” and explaining the public interest in maintaining the patent incentive to induce associated risk taking).

133. *In re Nalbandian*, 661 F.2d at 1216.

134. See *supra* notes 130–31 and accompanying text.

workers who are far removed from the technology underlying the final product, just as those manufacturing computer memory devices may be entirely ignorant of the underlying science.¹³⁵

In fact, restricting the PHOSITA's art to production rather than research is not as problematic as it might appear. Because the PHOSITA is a hypothetical construct designed to effectuate the purposes of patent law, its characteristics do not necessarily reflect the knowledge, skills, or perspectives of any single actual worker in the field. It would serve no purpose, for example, to conceive of the PHOSITA as a person who performs mechanistic functions without any understanding of what is being done. Such a conception would set the bar too low and ignore the reality that someone in the chain of production (or some aggregation of people in that chain) will generally understand the underlying science, even if a typical assembly line worker does not. Instead, the PHOSITA should be defined as a person or group of people with an understanding of how the underlying science is currently practiced. A PHOSITA with the perspective of such a hypothetical person or group would set the bar high enough without the circularity resulting from a researcher-based perspective.

The ideal PHOSITA construct would have sufficient creativity and intuition to synthesize references in ways that easily and naturally appear advantageous to a hypothetical, ordinarily skilled and knowledgeable producer.¹³⁶ The PHOSITA would possess ordinary judgment and insight that might realistically be present in a producer or production team. In sophisticated fields, the level of ordinary skill of the PHOSITA might be quite high, and the knowledge imputed to the PHOSITA might be expansive. However, the PHOSITA would not have the perspective of one who is expected to make non-obvious contributions to an art or who has devoted years to the pursuit of innovation, i.e., the perspective of a researcher. Nor would the PHOSITA have the extent of funding, time, staff or equipment that is present in real life in such amounts only because of the patent incentive.

VI. CONCLUSION

Public attitudes toward patent law have ebbed and flowed over time and will no doubt continue to do so.¹³⁷ The most recent trend

135. The author briefly worked to manufacture computer equipment on an assembly line at IBM and can attest that his own perspective would not have been appropriate for evaluating computer inventions.

136. Because producers (or their employers) are remunerated directly for their labors, there is little risk that their knowledge, skills and perspectives are the direct result of the patent system itself.

137. See Andrew B. Dzeguze, *The Devil in the Details: A Critique of KSR's Unwarranted Reinterpretation of "Person Having Ordinary Skill,"* 10 COLUM. SCI. & TECH. L.

favors a stricter standard for patents, as reflected in recent case law,¹³⁸ patent office practice,¹³⁹ and proposals for patent reform.¹⁴⁰ While patent reform may be needed, care must be taken not to allow the pendulum to swing too far toward a restrictive patent policy. As long as the patent system is believed necessary to promote the useful arts, patents must remain available for new and useful inventions that would not have been obvious to hypothetical, ordinarily skilled producers of the goods and services that society presently enjoys.

One aspect of current patent policy that threatens excessive restriction is the evolving PHOSITA standard, and in particular a critical dimension of this standard that has been largely neglected until now: the activity in which the PHOSITA is engaged. This dimension extends beyond simple definitions of field or scope of imputed knowledge, instead directing attention toward what the PHOSITA does within that field. Without the guiding influence of critical discussion, judicial and scholarly understanding of this neglected dimension of the PHOSITA standard has incrementally drifted from a conception of the PHOSITA as a competent producer to a professional researcher. Such a conception results in a circular, self-defeating approach to patentability in which the very research activities that the patent system seeks to promote are amalgamated into a standard that denies patentability to the resulting inventions.

Fortunately, such an outcome need not occur. A disciplined approach that conceives of the PHOSITA's art as competent production rather than innovation ensures that the goods and services available today will remain available while simultaneously preserving patent incentives for those actively seeking to advance the useful arts.

REV. 1, 13 (2009), available at <http://www.stlr.org/cite.cgi?volume=10&article=1>; *The Debate on the Patent Laws*, ECONOMIST, June 5, 1869, at 656 (predicting the imminent abolition of the patent system).

138. See, e.g., *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007) (raising obviousness standard); *Medimmune Inc. v. Genentech, Inc.*, 549 U.S. 118 (2007) (allowing licensee to more easily challenge patent); *eBay v. MercExchange, L.L.C.*, 547 U.S. 388 (2006) (making it more difficult to obtain an injunction); *In re Seagate Tech., LLC*, 497 F.3d 1360 (Fed. Cir. 2007) (making it more difficult to establish willful infringement); *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337 (Fed. Cir. 2004) (no longer subjecting defendants to an adverse inference of willfulness based on a failure to obtain opinion of counsel).

139. See *USPTO Oversight Hearing Before the Subcomm. on Courts, the Internet and Intellectual Property, Comm. on the Judiciary*, 110th Cong. 11 (2008) (statement of Jon Dudas, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office) ("The allowance rate for patents is currently 44%. This is in contrast to allowance rates in excess of 70% just eight years ago."); Gene Quinn, *PTO Hiring Freeze and Budget Problem*, IPWATCHDOG, Mar. 2, 2009, <http://www.ipwatchdog.com/2009/03/02/pto-hiring-freeze-and-budget-problems/id=2099/> (last visited Dec. 20, 2009) (providing graph indicating a drop in allowance rates from over 70% to 42% between 2000 and 2009, the lowest figure for more than thirty years).

140. Patent Reform Act of 2009, S. 515, 111th Cong. (proposing, *inter alia*, to limit damages and expand post grant review).