

Fordham International Law Journal

Volume 37, Issue 6

2014

Article 3

Hindsight Bias in Patent Law: Comparing the USPTO and the EPO

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NOTE

HINDSIGHT BIAS IN PATENT LAW: COMPARING THE USPTO AND THE EPO

*By: Zachary Quinlan**

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* J.D., 2014, Fordham University School of Law; A.B., 2009, Lafayette College. The Author extends his thanks to Professors John Richards and Hugh Hansen for their help, feedback, and criticism of this Note, and the editors of Volume 37 and 38 of the *Fordham International Law Journal* for their valuable feedback. The Author also thanks friends and family who supported and encouraged him to finish this Note.

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INTRODUCTION

Stem cells can be used to treat patients whose ability to generate new blood cells has been compromised by diseases such as lymphoma and leukemia.¹ Before the work of the inventors of US patent 5,004,681, stem cells were implanted in patients via bone marrow transplants.² Umbilical cord blood was considered a potential source of stem cells, but it was not clear whether human umbilical cord blood contained stem cells, or whether it would be suitable for transplant in adult human patients.³ The use of cord blood for stem cell transplants presents many advantages over bone marrow transplants including, for example, the ability to be frozen for later use and the relative ease of matching patients and donors.⁴ Based on the discovery that cord blood contained transplantable stem cells, the inventors obtained US patent number 5,004,681 (“681 patent”) on April 2, 1991 and obtained its European counterpart, number 0,343,217, on May 15, 1996.⁵ Barring any problems, the US patent

1. U.S. Patent No. 5,004,681 col. 4 l. 54–61 [hereinafter ‘681 Patent] (explaining the use of stem cells to restore patients’ ability to generate various blood cell types); Loyola Univ. Health Sys., *Breakthrough in treating leukemia, lymphoma patients with umbilical cord blood stem cells*, SCIENCE DAILY (Dec. 9, 2013), <http://www.sciencedaily.com/releases/2013/12/131209104923.htm> [hereinafter Breakthrough] (summarizing how stem cells from cord blood and bone marrow can be used to regenerate blood cells).

2. ‘681 Patent, *supra* note 1, at col. 4 l. 43–col. 5 l. 22 (describing the use of bone marrow transplantation as a source of stem cells to treat diseases and repair patients’ ability to produce blood); *Breakthrough*, *supra* note 1 (describing cord blood transplants as an alternative to bone marrow transplants).

3. *PharmaStem Therapeutics v. Viacell*, 491 F.3d 1342, 1374 (Fed. Cir. 2007) (Newman, J., dissenting) (citing testimony from a defense witness that stem cells were unconfirmed in cord blood before the work of the inventors); *id.* at 1376 (citing evidence that experts did not expect cord blood to provide a source of stem cells useful for transplants).

4. *Comparison Between Bone Marrow or Peripheral Blood Stem Cells and Cord Blood Donated for Transplantation*, NAT’L CORD BLOOD PROGRAM (2010), <http://www.nationalcordbloodprogram.org/qa/comparison.html> (comparing the advantages and disadvantages of bone marrow transplants and cord blood transplants); ‘681 Patent, *supra* note 1, at col. 5 l. 23–28, col. 22 l. 35–col. 24 l. 30 (describing the difficulty of finding matching bone marrow donors and how stem cells can be frozen and thawed).

5. ‘681 Patent, *supra* note 1, at [45] (stating the date of patent issue); EPO Patent No. 0,343,217 B1, [45] (stating the date of patent grant).

would last for seventeen years after it was issued, and the European Patents would last twenty years.⁶

Years later, Pharmastem Therapeutics, Inc., owner of the ‘681 patent, took advantage of its patent and filed an infringement lawsuit against competitors.⁷ The defendants challenged the ‘681 patent’s validity as not patentable for obviousness reasons in a 2003 jury trial, but the jury weighed the evidence and found the ‘681 patent valid and infringed by the defendants.⁸ The district court also denied defendants’ motion for Judgment as a Matter of Law (“JMOL”), concluding that the jury’s finding of non-obviousness and validity were reasonable.⁹ On appeal, a Federal Circuit panel found that the ‘681 patent was obvious and invalid in a 2-1 split decision.¹⁰ The majority opinion in *Pharmastem* has been criticized as a decision based on hindsight because it found the patent to be obvious despite evidence that other scientists in the same field heralded the invention as an important breakthrough.¹¹ This case illustrates how it is easy to say that an inventor should have seen the “obvious” solution once the unknown future becomes the certain past, even if those ideas were not so obvious at the time.¹²

6. 35 U.S.C. § 154(c)(1) (1994) (“The term of a patent that is in force on or that results from an application filed before the date that is 6 months after the date of the enactment of the Uruguay Round Agreements Act shall be the greater of the 20-year term as provided in subsection (a), or 17 years from grant”); Convention on the Grant of European Patents art. 63(1), 2013 (“The term of the European patent shall be 20 years from the date of filing of the application.”). The Uruguay Round Agreements Act was enacted on December 8, 1994, making the critical date June 8, 1995. Uruguay Round Agreements Act, H.R. 5110, 103d Cong. (1994).

7. *PharmaStem Therapeutics v. Viacell*, No. 02-148-GMS, Jury Verdict Form at 1–4 (D. Del. Oct. 29, 2003) (reciting that PharmaStem filed the initial lawsuit).

8. *Id.* at 1346 (finding that defendants infringed the ‘681 patent and that the ‘681 patent was valid and not obvious).

9. *Id.* at 1359 (noting the district court’s denial of JMOL to defendants).

10. *Id.* (holding that the district should have ruled in favor of the defendants on the issue of obviousness).

11. Yu Cai, *Using Hindsight in Determining Patent Obviousness: Observations on PharmaStem v. Viacell*, 48 JURIMETRICS J. 379, 403 (criticizing the Federal Circuit for using hindsight to assert that an invention was the result of routine experimentation to confirm a known scientific prediction); *PharmaStem*, 491 F.3d at 1374 (Newman, J., dissenting) (accusing the majority opinion of “[using] present knowledge of the inventors’ success to find that it was obvious all along.”).

12. Baruch Fischhoff, *Perceived Informativeness of Facts*, 3 HUMAN PERCEPTION AND PERFORMANCE 349, 349 (1977) (“In hindsight terms, we may believe that the facts we hear more or less had to be the answers to their respective questions.”); Neal J. Rose & Kathleen D. Vohs, *Hindsight Bias*, 7 PERSPECTIVES ON PSYCHOLOGICAL SCI. 411, 411–12 (2012)

In both the United States and Europe inventions must be novel and have an inventive step in order to justify the monopoly granted to patentees, and the '681 patent failed to meet the inventive step requirement.¹³ An invention lacks novelty if all its features can be found together in a single prior invention or publication, known as "prior art."¹⁴ To satisfy the inventive step requirement, an invention cannot be obvious.¹⁵ Obviousness is evaluated from the perspective of a person having ordinary skill in the art ("PHOSITA")¹⁶ at the time of filing a patent.¹⁷ Obviousness is shown by either combining the teachings of multiple related prior art references¹⁸ or by modifying a single reference.¹⁹ The issue that arises is whether a given

(describing hindsight as "the inability to recapture the feeling of uncertainty that preceded an event.").

13. See 35 U.S.C. §§ 101–103 (2012) (requiring novelty and non-obviousness for inventions to be patentable); *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152–53 (1950) (reasoning that a patent monopoly is justified by a meaningful contribution to technical knowledge); Convention on the Grant of European Patents arts. 52, 54, 56, Oct. 5 1973 (requiring novelty and inventive step for inventions to be patentable).

14. See EUROPEAN PATENT OFFICE, CASE LAW OF THE BOARDS OF APPEAL at 107 (7th ed. 2013), <http://www.epo.org/law-practice/case-law-appeals/case-law.html> [hereinafter CASE LAW OF THE BOA] (stating that multiple prior art references may not be combined to show novelty); *Specialty Rental Tools & Supply, Inc. v. Boyd's Bit Serv., Inc.*, 84 F. App'x 90, 96 (Fed. Cir. 2003) ("Prior art anticipates when it discloses and enables each and every element of the challenged claim.").

15. 35 U.S.C. § 103 ("A patent for a claimed invention may not be obtained . . . if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art . . ."); Convention on the Grant of European Patents art. 56, Oct. 5 1973 ("An invention shall be considered as involving an inventive step if . . . it is not obvious to a person skilled in the art.").

16. The Person Having Ordinary Skill In The Art ("PHOSITA") is a fictitious person who practices in the technical field of a given invention, and is used as part of the test for obviousness in patent law. See Daralyn J. Durie & Mark A. Lemley, *A Realistic Approach to the Obviousness of Inventions*, 50 WM. & MARY L. REV. 989, 992–93 (2008) (discussing the role of the PHOSITA as a hypothetical person used to make evaluations in patent law); Joseph P. Meara, *Just Who is the Person Having Ordinary Skill in the Art? Patent Law's Mysterious Personage*, 77 WASH. L. REV. 267, 267 (2002) (comparing the PHOSITA's role in patent law to that of the reasonable person in torts).

17. See *supra* note 15 and accompanying text.

18. "Prior art" is the documents that can be used against a patent application to show that it is not novel or is obvious; any particular piece of the prior art is called a reference, whether it is a patent, a technical publication, a public use of an invention. See 1 DONALD S. CHISUM, CHISUM ON PATENTS GI-18 (Matthew Bender, Release No. 144 2014); BLACK'S LAW DICTIONARY 126-27, 1393 (9th ed. 2009) (defining "prior art" and "reference" as terms of art in patent law referring to the knowledge available to reject a patent application).

19. See UNITED STATES GROUP, QUESTION Q217: THE PATENTABILITY CRITERION OF INVENTIVE STEP / NON-OBVIOUSNESS, 6 (AIPPI 2011) [hereinafter AIPPI US GROUP REPORT], available at <https://www.aippi.org/download/committees/217/GR217usa.pdf>

combination or modification of prior art would have been obvious to a PHOSITA.²⁰

Under both US and European patent law, the judgment of obviousness should be made from the perspective of a PHOSITA before the filing date, without knowledge of how the invention works.²¹ In reality a patent may be reviewed by examiners, judges, and juries who determine obviousness with detailed knowledge of the exact nature of the invention.²² They must therefore look back in time to make two essential judgments: the level of the PHOSITA's skill and knowledge at the filing date and whether a particular combination or modification would have been obvious to that PHOSITA.²³ Evaluators who know what happened after an event cannot forget or ignore this knowledge when making a judgment: this is hindsight bias, which makes it impossible to judge whether an invention would

(explaining that obviousness can be shown in the United States based on one reference or a combination of references). For EPO practice see THE NETHERLANDS GROUP, QUESTION Q217: THE PATENTABILITY CRITERION OF INVENTIVE STEP / NON-OBVIOUSNESS, 3–4 (AIPPI 2011) [hereinafter AIPPI NETHERLANDS GROUP REPORT], available at https://www.aippi.org/download/committees/217/GR217the_netherlands.pdf (discussing inventive step in the EPO in terms of either modification of a single reference, or combinations of two or more references).

20. See AIPPI US GROUP REPORT, *supra* note 19, at 5 (explaining that a PHOSITA's motivation is relevant to determining whether a combination of prior art would be obvious); AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 2–4 (reciting EPO requirements that inventions not be obvious to a PHOSITA and discussing the need to show a motivation for a PHOSITA to combine prior art).

21. See 35 U.S.C. § 103 (defining obviousness from the perspective of a PHOSITA before the filing date); Convention on the Grant of European Patents art. 54(2), Oct. 5 1973 (“The state of the art shall be held to comprise everything made available to the public . . . before the date of filing of the European patent application.”).

22. See Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration that the hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391, 1399–1400 (2006) [hereinafter *Patently Non-Obvious I*] (stating that evaluators of obviousness cannot forget their knowledge of the invention); Gregory N. 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, 3 (2007) [hereinafter *Patently Non-Obvious II*] (claiming that judges, juries, and examiners have detailed knowledge of an invention when they examine it).

23. See Alan P. Klein, *Understanding the Doctrines of “Reason, Suggestion, or Motivation to Combine” and “Reason, Suggestion, or Motivation to Modify”*, 45 IDEA 293, 293 (2005) (framing a discussion of obviousness in two parts, one for combination inventions, and one for modification inventions); GERMANY GROUP, QUESTION Q217: THE PATENTABILITY CRITERION OF INVENTIVE STEP / NON-OBVIOUSNESS, 5–6 (AIPPI 2011) [hereinafter AIPPI GERMANY GROUP REPORT], available at https://www.aippi.org/download/committees/217/GR217germany_en.pdf (discussing how prior art can be modified or combined to show obviousness in German and EPO patent practice).

have been obvious to somebody who has not been told how it works.²⁴

This Note will compare how each patent system addresses, or fails to address, hindsight bias, and recommends how each system could improve by adopting features from the other. Both the European and US patent systems are aware of the problem of hindsight in patent examinations, and a patent validity decision based on hindsight is technically improper in both systems.²⁵ The examination guidelines of the European Patent Office (“EPO”) directly address the issue of “ex post facto” analysis and conclude that it is an improper basis for a decision.²⁶ The United States Patent and Trademark Office (“USPTO”) and US courts have also made it clear that “[i]t is difficult but necessary that the decision maker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art.”²⁷

24. See *Patently Non-Obvious I*, *supra* note 22, at 1399–1400 (stating that evaluators of obviousness cannot forget their knowledge of the outcome of an event and are subject to hindsight); *Rose & Vohs*, *supra* note 12, at 411–12 (describing hindsight as “the inability to recapture the feeling of uncertainty that preceded an event.”).

25. Compare EUROPEAN PATENT OFFICE, GUIDELINES FOR EXAMINATION, pt. G, ch. VII, at 8-9 (June 2012), available at <http://www.epo.org/law-practice/legal-texts/guidelines.html> [hereinafter EPO GUIDELINES], (advising examiners to take a realistic view of the entirety of the prior art because the prior art search is done with the knowledge of what the invention achieves and how it is achieved), and CASE LAW OF THE BOA, *supra* note 14, at 184 (discussing case law in the EPO that rejects combinations of prior art based on ex post facto analysis as a way to show obviousness), and Case T 0294/99 of the Technical Boards of Appeal of the EPO, at 11 (April 18, 2002) (ruling that the teaching of two prior art documents would only be combined by a PHOSITA with the benefit of hindsight from the invention), with *Kenetic Concepts, Inc. v. Smith Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012) (stating that constructing inventions from prior art using hindsight is not an acceptable way to show obviousness), and *W.L. Gore Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit . . . is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”), and UNITED STATES PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2141.01, III (2012), available at <http://www.uspto.gov/web/offices/pac/mpep/> [hereinafter MPEP] (teaching that the requirement to evaluate an invention “at the time the invention was made” is meant to avoid hindsight).

26. See *supra* note 25 and accompanying text.

27. *Garlock*, 721 F.2d at 1553; see also *CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269, 1310 (Fed. Cir. 2013) (“While apparently routine at the present time to use computers to perform instantaneous international financial transactions, this court will not engage in the hindsight error of speculating about the state of that technology over twenty years ago.”).

In this Note, Part I begins with a general look into hindsight bias and its causes and effects. Part I also evaluates obviousness and inventive step in US courts, the USPTO, and the EPO. This analysis includes a comparison of the legal tests employed in each jurisdiction. Part II of this Note compares how hindsight bias affects the proper functioning of both patent systems. Finally, Part III recommends that both systems take something from the other to help avoid hindsight, and that both systems give objective indicia of non-obviousness greater weight in their decisions.

I. THE LEGAL BACKGROUND OF HINDSIGHT BIAS AND PATENT LAW

This Part begins with an overview of the causes and effects of hindsight bias. Then, this Part provides an overview of the various tests used in the United States and the EPO to evaluate inventive step.

A. Hindsight Bias

1. The Problem of Hindsight

Before discussing the US and European patent systems in greater detail, it is helpful to discuss the causes and effects of hindsight bias to better understand how it affects the law, including patent law. Hindsight bias is a mental bias present in the evaluation of past decisions or events where the evaluator knows the outcome of those decisions or events, particularly when judging the likelihood, foreseeability, or predictability of a past event from an *ex ante* perspective.²⁸ Hindsight bias also causes harsher judgments of others, as people are more likely to believe that the subject of the judgment should have foreseen the actual outcome and prepared for it.²⁹

28. See Rose & Vohs, *supra* note 12, at 411–13 (describing three levels of hindsight bias, distorted memories of a past decision, a sense that the actual outcome was inevitable, and a subject's belief that he foresaw the outcome, summarized as "the inability to recapture the feeling of uncertainty that preceded an event."); D. Jordan Lowe & Philip M.J. Reckers, *The Effects of Hindsight Bias on Jurors' Evaluations of Auditor Decisions*, 25 DECISION SCIENCES 401, 401 (1994) (stating that hindsight bias effects the perceived ability of people to predict past events); Hal R. Arkes et. al., *Eliminating the Hindsight Bias*, 73 J. APPLIED PSYCHOLOGY 305 (1988) ("Hindsight bias is defined as the tendency for people considering a past event to overestimate their likelihood of having predicted its occurrence.").

29. Susan J. LaBine & Gary LaBine, *Determinations of Negligence and the Hindsight Bias*, 20 LAW. HUM. BEHAV. 501, 510 (1996) (finding that potential jurors who knew whether therapists' patients committed violent acts were more likely to find the therapists negligent).

Hindsight bias is present in many areas of law where judges and juries must look back in time and judge decisions made in the past, including negligence, malpractice, and corporate law.³⁰ The California Supreme Court's *Tarasoff* decision, which placed a duty on therapists to take measures to prevent harm if they believe a patient will harm a third party, is an example of hindsight bias.³¹ *Tarasoff* has been criticized as placing the extremely difficult decision whether to report in the hands of therapists, and then judging them with the benefit of hindsight if anything unfortunate happens.³² According to some, corporate decision-makers are better off in Delaware than California's therapists, because the "business judgment rule" shields corporate decisions from hindsight second-guessing.³³ Hindsight is a problem in these fields because the evaluator is supposed to adopt the perspective of somebody before the accident or decision in question.³⁴

In patent law, hindsight bias is an important issue when determining if an invention has inventive step because it is a particularly subjective judgment that can be influenced by the

than those who did not know patients later actions); Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post ≠ Ex Ante: Determining Liability in Hindsight*, 19 *LAW. HUM. BEHAV.* 89, 98 (describing significant hindsight bias present in a study where potential jurors were asked to decide whether a city government should have taken additional flood precautions).

30. See Hal R. Arkes & Cindy A. Schpani, *Medical Malpractice v. the Business Judgment Rule: Differences in Hindsight Bias*, 73 *OR. L. REV.* 587, 589–90 (1994) (comparing the prevalence of hindsight bias in medical malpractice decisions with the business judgment rule, which protects business executives from hindsight bias); LaBine & LaBine, *supra* note 29, at 506–10 (discussing how the presence of an injured party makes potential jurors more likely to find negligence in a professional negligence case).

31. See *Tarasoff v. Regents of Univ. of Cal.*, 551 P.2d 334, 340 (1976) ("When a therapist determines . . . that his patient presents a serious danger of violence to another, he incurs an obligation to use reasonable care to protect the intended victim."); LaBine & LaBine, *supra* note 29, at 501 (explaining the duty created under *Tarasoff*).

32. See *Tarasoff*, 551 P.2d at 361 (1976) (Clark, J., dissenting) (noting that psychiatrists, without the benefit of hindsight, face a much more difficult judgment than courts reviewing their decisions); LaBine & LaBine, *supra* note 29, at 512 (concluding that knowledge of a violent outcome may cause jurors in *Tarasoff*-type cases to judge therapists more harshly than is warranted).

33. See *Brehm v. Eisner*, 746 A.2d 244, 261 (Del. 2000) (holding that an expert's opinion on what directors should have done did not overcome the business judgment rule because it was based on hindsight); Arkes & Schpani, *supra* note 30, at 610 (characterizing the business judgment rule as a way to protect corporate decisions from hindsight bias in courts).

34. See *Tarasoff*, 551 P.2d at 345 (explaining that proof in hindsight that the wrong choice was made cannot establish liability in negligence); Arkes & Schpani, *supra* note 30, at 588–89 (stating that courts presume that jurors can make decisions while ignoring their knowledge of an accident); LaBine & LaBine, *supra* note 29, at 502 (expressing concern that jurors in malpractice cases are biased by knowledge of the outcome).

evaluator's perceptions of the past, and because it is very often the crux of patent examination and litigation.³⁵ Hindsight bias arises in inventive step analysis because patent examiners, judges, and juries evaluate patent applications with the knowledge of the invention in question and how it works in comparison to prior known methods or devices.³⁶ This knowledge makes these evaluators more likely to think an invention is obvious and refuse issuing a patent.³⁷

Courts have employed numerous methods to combat hindsight bias, although few of these methods have proven effective.³⁸ Jury instructions telling jurors to ignore hindsight bias appear to have little or no effect on jury determinations of obviousness.³⁹ For example,

35. See Stephen G. Kunin & Philippe J.C. Signore, *A Comparative Analysis of The Inventive Step Standard in the European and Japanese Patent Offices from a US Perspective*, IP LITIGATOR, Jan./Feb. 2008, at 16 (describing obviousness as a subjective determination); Natalie A. Thomas, Note, *Secondary Considerations in Non-Obviousness Analysis: The Use of Objective Indicia Following KSR v. Teleflex*, 86 N.Y.U. L. REV., 2070, 2095 (2011) (describing obviousness as a subjective decision); Dennis Crouch, BPAI/PTAB Obviousness Decision Trends, <http://patentlyo.com/patent/2012/12/bpaipat-obviousness-decision-trends.html> (determining that 80–85% of Patent Trial and Appeal Board decisions discuss obviousness); Patently Non-Obvious I, *supra* note 22 at 1398 (claiming that obviousness is the most litigated and most important requirement of patent validity).

36. See EPO GUIDELINES, Part G - Ch. VII, at 8 (noting that prior art searches are done by examiners who know how the invention works); Patently Non-Obvious II, *supra* note 22 at 3 (explaining that judges, jurors, and examiners know how an invention works when they evaluate its obviousness).

37. See Patently Non-Obvious II, *supra* note 22, at 18 (concluding that subjects with knowledge of an invention are more likely to find it obvious); Patently Non-Obvious I, *supra* note 22, at 1409 (determining that potential jurors with knowledge of an invention are more likely to find it obvious).

38. See *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966) (noting that secondary considerations can help courts to avoid hindsight in patent decisions); *In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006) (“The ‘motivation-suggestion-teaching’ requirement protects against the entry of hindsight into the obviousness analysis.”); *Zonolite Co. v. United States*, 149 F. Supp. 953, 957 (Ct. Cl. 1957) (“Hindsight cannot support an assertion of obviousness.”).

39. See Patently Non-Obvious II, *supra* note 22, at 17 (discussing a study in which jury instructions based on the TSM test did not alleviate hindsight bias compared to instructions based on *Graham*); see also Kamin & Rachlinski, *supra* note 29, at 99 (showing that jury instructions designed to alleviate hindsight bias did not effectively alleviate the bias in a negligence decision); Patently Non-Obvious I, *supra* note 22, at 1410 (finding that test subjects receiving debiasing jury instructions for patent validity were only slightly less likely to find obviousness than those who did not receive debiasing instructions). See also Fed. Circuit Bar Ass’n, *Model Patent Jury Instructions*, 51 (Feb. 2013), [http://www.fedcirbar.org/olc/filelib/LVFC/cpages/9008/Library/FCBA%20Model%20Patent%20Jury%20Instructions%20\(UPDATED%20Feb2013\).pdf](http://www.fedcirbar.org/olc/filelib/LVFC/cpages/9008/Library/FCBA%20Model%20Patent%20Jury%20Instructions%20(UPDATED%20Feb2013).pdf) (instructing jurors not to use hindsight and consider obviousness from the time of invention); Nat’l Jury Instructions Project, *Model Patent Jury Instructions*, 48 (June 17, 2009), <http://www.nationaljuryinstructions.org/documents/NationalPatentJuryInstructions.pdf> (warning jurors not to use hindsight).

the National Jury Instructions Project's model patent jury instructions include this warning for jurors:

[B]e careful not to determine obviousness using hindsight; many true inventions can seem obvious after the fact. You should put yourself in the position of a person of ordinary skill in the field of the invention at the time the claimed invention was made, and you should not consider what is known today or what is learned from the teaching of the patent.⁴⁰ The Federal Circuit Bar Association's obviousness instructions simply instruct jurors, "Do not use hindsight."⁴¹

Reducing the effects of hindsight bias is not a hopeless endeavor.⁴² Procedures that force evaluators to consider the foresight position and generate alternative possible outcomes are more effective in alleviating hindsight than simple education.⁴³ Some other factors known to mitigate the effects of hindsight bias are better implemented by patent offices than courts.⁴⁴ Expertise and experience in a particular area reduce the effect of hindsight bias, allowing patent examiners with an expertise in a technical field and familiarity with the obviousness determination to provide a more objective judgment of an invention.⁴⁵ The advantage of expertise has led some to suggest

40. Nat'l Jury Instructions Project, *supra* note 39, at 48.

41. Fed. Circuit Bar Ass'n, *supra* note 39, at 51.

42. See Martin F. Davies, *Reduction of Hindsight Bias by Restoration of Foresight Perspective: Effectiveness of Foresight-Encoding and Hindsight-Retrieval Strategies*, 40 *ORG. BEHAV. HUM. DECISION PROCESSES* 50, 63 (1987) (reviewing experimental results showing a reduction in hindsight bias); Rose & Vohs, *supra* note 12 at 418–19 (explaining that expertise likely helps alleviate hindsight when an expert can receive regular feedback on their decisions).

43. See Davies, *supra* note 42, at 56–57 (showing that test subjects with outcome knowledge of an event exhibited less hindsight bias if forced to review their own foresight notes about the event); *id.* at 63 (showing that test subjects with outcome knowledge of an event exhibited less hindsight bias if asked to generate various possible outcomes and develop reasons why each might have happened).

44. See Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 *BERKELEY TECH. L.J.* 885, 899–900 (2004) (suggesting changes to USPTO practice to alleviate hindsight bias); *Patently Non-Obvious II*, *supra* note 22, at 35–36 (suggesting a bifurcated examination procedure to reduce hindsight in the USPTO).

45. See *Patently Non-Obvious II*, *supra* note 22, at 23–24 (noting that expertise and familiarity with an area can slightly reduce the effects of hindsight bias); Rose & Vohs, *supra* note 12, at 418–19 (determining that expertise likely helps alleviate hindsight when an expert can receive regular feedback on their decisions).

that patent offices are better situated than courts to address the problem of hindsight bias in patent law.⁴⁶

B. *Obviousness Law in the United States*

US law requires that, in order to be inventive, inventions be non-obvious to a PHOSITA.⁴⁷ The US patent statute alone, found in Title 35 of the US Code, does not give much guidance to the obviousness inquiry.⁴⁸ In 1966 the US Supreme Court laid out three steps of inquiry to structure the obviousness determination in *Graham v. John Deere Co.*: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; and (3) the differences between the claimed invention and the prior art.⁴⁹ The last two steps are often combined into a single analysis, so this Note will treat them together.⁵⁰ In addition to these three core inquiries, objective indicia must also be considered in a determination of obviousness.⁵¹

46. See Eisenberg, *supra* note 44, at 899–900 (suggesting that the USPTO should consult current practitioners to get a more accurate view of what a PHOSITA would think of an invention); Patently Non-Obvious II, *supra* note 22, at 35–36 (suggesting that, to avoid hindsight, determination of obviousness at the USPTO be done by an additional examiner who is not given the details of the invention).

47. 35 U.S.C. § 103 (“A patent for a claimed invention may not be obtained... if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious . . .”); See AIPPI US GROUP REPORT, *supra* note 19, at 1–2 (expressing the inventive step requirement in the United States in terms of obviousness).

48. 35 U.S.C. § 103 (stating only that an invention must not be obvious to a person skilled in the art pertaining to the invention); Dennis Crouch, *KSR v. Teleflex: A Tale Full of Sound and Fury Signifying Little?*, PATENTLYO (May 2, 2007), http://patentlyo.com/patent/2007/05/ksr_v_teleflex_.html (“After seven Supreme Court cases on obviousness, there still is little guidance beyond the statutory language itself) concerning how a decision-maker is supposed to measure the level of ingenuity necessary to satisfy the non-obvious requirement.”).

49. See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966) (defining the four stages of an obviousness analysis); *Soverain Software LLC v. Newegg Inc.*, 705 F.3d 1333, 1336 (Fed. Cir. 2013) (using the *Graham* factors to evaluate obviousness); see also MPEP, *supra* note 25, § 2141, II (directing patent examiners that a finding of obviousness must be based on the *Graham* inquiries).

50. See *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (discussing combinability of references in terms of the PHOSITA’s capabilities); *Norgen Inc. v. Int’l Trade Comm’n*, 699 F.3d 1317, 1326 (determining the differences between the prior art and the invention in terms of what a PHOSITA would do).

51. *Graham*, 383 U.S. at 17–18 (“Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy.”); *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1081–84 (Fed. Cir. 2012) (ruling that a long-felt need and the failure of others to meet that need were sufficient to

1. Scope and Content of the Prior Art: Analogous Art

Under the first *Graham* factor, the Federal Circuit requires conducting the analogous art test to determine the scope and content of the prior art.⁵² While any prior art can be brought against a patent or patent application to show a lack of novelty, only “analogous art” may be considered to prove obviousness.⁵³ Art that is found not to be analogous cannot be used in a combination or modification to show obviousness.⁵⁴ Prior art is analogous if it satisfies one of two criteria: (1) it is in the same field of endeavor as the invention; or (2) it was reasonably pertinent to a problem faced by the inventor.⁵⁵ A prior art reference can be modified or combined with other prior art references to show obviousness if it is determined to be “analogous art.”⁵⁶

The first prong of the analogous art test, the field of endeavor, can be defined very broadly or very narrowly, depending on the level

show that the invention was not obvious). Called “secondary considerations” in *Graham*, the last piece of obviousness analysis is known by many names, including “objective criteria.” See Amanda Wiekler, *Secondary Considerations Should Be Given Increased Weight in Obvious Inquiries Under 35 U.S.C. §103 in the Post-KSR v. Teleflex World*, 17 FED. CIRCUIT B.J. 665, 666 (2008); see also *id.* at 674 (using “objective indicia”); *Riverwood Int'l Corp. v. Mead Corp.*, 212 F.3d 1365, 1367 (Fed. Cir. 2000) (using “objective factors”); *Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc.*, 98 F.3d 1563, 1570 (Fed. Cir. 1996) (using “objective evidence”); Durie & Lemley, *supra* note 16, at 995 (using “secondary indicia”). This Note will use the term “objective indicia” in reference to US law. The EPO uses the term “secondary indicators,” which this Note will follow when discussing EPO law. See EPO GUIDELINES, pt. G ch VII § 10.

52. See *In Re Kahn*, 441 F.3d 977, 986–87 (Fed. Cir. 2006) (explaining the analogous art test and its relationship to the *Graham* factors); *In Re Deminski*, 796 F.2d 436, 441–42 (Fed. Cir. 1986) (applying the analogous art test in the prior art section of an obviousness decision).

53. See Lance Leonard Barry, *Cézanne and Renior: Analogous Art in Patent Law*, 13 TEX. INTEL. PROP. L.J. 243, 245 (2005) (stating that the question of analogous art is relevant to obviousness, but not novelty); *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994) (holding that, despite coming from different industries, prior art for hinges, housings, and latches were analogous to a patent for a laptop computer hinge because they addressed similar technical problems).

54. *Wang Labs, Inc. v. Toshiba Corp.*, 993 F.2d 858, 865 (Fed. Cir. 1993) (“The Allen–Bradley patent and X9 SIMM, not being analogous prior art, thus could not have rendered the claimed subject matter obvious.”); *Baxter Diagnostics, Inc. v. AVL Scientific Corp.*, 924 F. Supp. 994, 1008 modified, 954 F. Supp. 199 (C.D. Cal. 1996) (“Because the Volmar and Widder article is not analogous prior art, the Court will not consider it in the obviousness analysis.”).

55. See Barry, *supra* note 53, at 250 (stating two criteria for finding analogous art: the field of endeavor and pertinence to a problem with which the inventor was faced); *Innovention Toys, LLC v. MGA Entertainment, Inc.*, 637 F.3d 1314, 1321 (Fed. Cir. 2011) (explaining field of endeavor and the problem addressed as the two criteria for finding analogous art).

56. See *supra* notes 53–54 and accompanying text.

of technical specialization present in the industry.⁵⁷ Generally, advanced fields requiring a high degree of specialization, like computer memory design, will be defined more narrowly and less specialized fields will be defined more broadly.⁵⁸ Courts, and the USPTO, exercise a degree of freedom when defining the inventor's field, which may not always be defined as expected.⁵⁹ Examiners and courts can also use prior art outside the field of endeavor where a similar problem or purpose is addressed by the reference.⁶⁰ Prior art references with similar purposes are relevant to solving the same problems and are more likely to lead an inventor to consider them as solutions.⁶¹ How broadly a problem is defined can have a significant impact on obviousness decisions by determining which references may be used to invalidate a patent.⁶²

57. See Barry, *supra* note 53, at 247–50 (citing cases demonstrating that a broad range of art is considered analogous in the mechanical arts, while a more limited scope can be taken in computer memory design art); Paulsen, 30 F.3d at 1481 (“We agree with the Board that given the nature of the problems confronted by the inventors, one of ordinary skill in the art would have consulted the mechanical arts for housings, hinges, latches, springs, etc. Thus, the cited references are reasonably pertinent...”) (internal quotations omitted).

58. See Barry, *supra* note 53, at 246–49 (comparing the determination of analogous art in patent cases in simple mechanical fields to others in highly specialized fields, like computer memory design); Jeffery T. Burgess, *The Analogous Art Test*, 7 BUFF. INTELL. PROP. L.J. 63, 73 (2009) (claiming that the field of endeavor can be defined broadly for simple mechanical inventions like hairbrushes and toothbrushes, and more narrowly for complex, specialized inventions).

59. See Barry, *supra* note 53, at 250–52 (summarizing a trend for the field of endeavor to be defined in terms of the functional character of the invention); Burgess, *supra* note 58, at 72 (noting that the USPTO relies mainly on similar function to determine whether prior art is in the same field of endeavor as a patent application).

60. See Barry, *supra* note 53, at 253 (“Similarities or differences between the field of a reference and that of an inventor are not important for the second criterion; it is the problems addressed by the reference and the inventor that matter.”); Paulsen, 30 F.3d at 1481 (ruling that prior art concerning “hinges and latches as used in a desktop telephone directory, a piano lid, a kitchen cabinet, a washing machine cabinet, a wooden furniture cabinet, or a two-part housing for storing audio cassettes” was analogous to a patent for a hinged portable computer because they were pertinent to the problems faced by the inventor).

61. See *KSR*, 550 U.S. at 421 (determining that using known elements to reach success as expected is usually obvious innovation, not patentable inventiveness); *In Re Kubin*, 561 F.3d 1352, 1360 (Fed. Cir. 2009) (discussing the importance of a “reasonable expectation of success” to determining obviousness).

62. See Barry, *supra* note 53, at 253–58 (reviewing case law where addressing only one part of a compound problem is needed to make a prior art analogous); Burgess, *supra* note 58, at 68–69 (arguing that the breadth of analogous art is important because it determines the breadth of the PHOSITA’s knowledge in obviousness decisions).

2. Level of Ordinary Skill Differences Between the Invention and the Art

The extent of the PHOSITA's creativity and skill comes into play when deciding whether a PHOSITA would have performed a given combination or modification of prior art, rendering the invention obvious, or whether the combination or modification would have been beyond the PHOSITA's creativity, and therefore not obvious.⁶³ The PHOSITA is understood as having skills greater than an uncreative follower of prior art, but less than an insightful inventor.⁶⁴ The PHOSITA's knowledge includes what is disclosed in analogous prior art documents.⁶⁵

The Supreme Court's 2007 decision in *KSR v. Teleflex* significantly impacted how a PHOSITA should read and use prior art.⁶⁶ For many years before *KSR* the Federal Circuit⁶⁷ consistently used the "teaching, suggestion, or motivation" test (the "TSM test") to decide obviousness, which required a teaching, suggestion, or motivation in the prior art that would give the PHOSITA a reason to perform a combination or modification to reach the invention and render it obvious and not patentable.⁶⁸ The TSM test was intended to

63. See AIPPI US GROUP REPORT, *supra* note 19, at 4–5 (discussing the PHOSITA's key role in determining which modifications or combinations of prior art are obvious); *KSR*, 550 U.S. at 419–21 (overturning a determination of non-obviousness based on the creativity of the PHOSITA); Joseph Scott Miller, *Remixing Obviousness*, 16 TEX. INTELL. PROP. L.J. 237, 247–50 (2008) (discussing the importance of the role of a PHOSITA's creativity in determining obviousness).

64. See *KSR*, 550 U.S. at 421 ("a person of ordinary skill is also a person of ordinary creativity, not an automaton."); see *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 617 F.3d 1296, 1304 (Fed. Cir. 2010) (declining to adopt a limited application of prior art that would render the PHOSITA an "automaton").

65. See MPEP, *supra* note 25, § 2141.03 (stating that a PHOSITA "is presumed to have known the relevant art at the time of the invention."); Burgess, *supra* note 58, at 68–69 (noting that analogous art is important because it defines the PHOSITA's scope of knowledge of the prior art).

66. Gene Quinn, *KSR the 5th Anniversary: One Supremely Obvious Mess*, IPWATCHDOG (Apr. 29, 2012, 12:36 PM), <http://www.ipwatchdog.com/2012/04/29/ksr-the-5th-anniversary-one-supremely-obvious-mess/> (explaining the *KSR* decision as changing what evidence can show that an invention would have been obvious to a PHOSITA); Dennis Crouch, *Impact of KSR v. Teleflex on Pharmaceutical Industry*, PATENTLYO, (May 3, 2007) http://patentlyo.com/patent/2007/05/impact_of_ksr_v.html (reading *KSR* as requiring common sense be added to the determination of what is obvious to the PHOSITA).

67. All patent appeals in the United States go to the Federal Circuit. See 28 U.S.C. § 1295 (2012) (granting the Federal Circuit exclusive jurisdiction in all patent appeals from US district courts).

68. See *Commonwealth Sci. Indus. Research Org. v. Buffalo Tech. (USA), Inc.*, 542 F.3d 1363, 1373–74 (Fed. Cir. 2008) (discussing the tests for obviousness before and after

curtail hindsight bias, based on the reasoning that “combining prior art references without evidence of such a suggestion, teaching or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight.”⁶⁹

In 2007, the US Supreme Court rejected the Federal Circuit’s rigid use of the TSM test as a necessary condition to show obviousness.⁷⁰ The court did not reject use of the TSM test outright, but instead admonished the Federal Circuit to accept other means of showing obviousness in addition to the TSM test.⁷¹ The *KSR* court emphasized that the PHOSITA’s level of creativity and skill is not as great as an inventor’s, but is greater than an “automaton,” who unthinkingly follows what the prior art indicates is possible.⁷² The PHOSITA is now capable of going beyond the TSM test and using earlier inventions for obvious purposes that were not explicitly disclosed where there is an expectation of success.⁷³ A patentee can

KSR); D. Benjamin Borson, *KSR v. Teleflex, Inc.: The Supreme Court Reviews Obviousness*, 89 J. PAT. TRADEMARK OFF. SOC’Y 523, 524–25 (2007) (summarizing Federal Circuit law leading up to *KSR* as requiring a showing of a teaching, suggestion, or motivation to combine prior art to show obviousness); Marian Underweiser, *Presumed Obvious: How KSR Redefines the obviousness inquiry to improve the public record of a patent*, 50 IDEA 247, 255–56 (2010) (describing the TSM test as the test for obviousness in the Federal Circuit prior to the *KSR* decision).

69. Borson, *supra* note 68, at 525. (quoting *In Re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)); *see also In Re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006) (assuming that the patent office used hindsight bias to reach a finding of obviousness when the office did not use the teaching-suggestion-motivation test); Meara, *supra* note 16, at 275 (claiming that the Federal Circuit’s requirement for a suggestion or teaching in the prior art was intended to protect against hindsight in obviousness decisions); *Obviousness*, 121 HARV. L. REV. 375, 375–76 (2007) (describing the TSM test as intended to combat hindsight).

70. *See KSR*, 550 U.S. at 401–03 (ruling that rigid application of the TSM test as applied by the Federal Circuit was “incompatible with [the] Court’s precedents.”); Underweiser, *supra* note 68, at 269 (summarizing *KSR* as requiring motivations for a PHOSITA beyond the TSM test).

71. *See KSR*, 550 U.S. at 402 (“The flaws in the Federal Circuit’s analysis relate mostly to its narrow conception of the obviousness inquiry consequent in its application of the TSM test.”); *see also MPEP*, *supra* note 25, § 2143 (emphasis added) (listing possible ways to make a prima facie case of obviousness, including “teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.”).

72. *See supra* note 63 and accompanying text.

73. *See KSR*, 550 U.S. at 420 (claiming that a PHOSITA can see uses for inventions beyond their express intended purposes); *see also Miller supra* note 63, at 239 (describing the PHOSITA’s newfound creativity as creating a presumption that analogous art can be combined); *In Re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009) (discussing the importance of a “reasonable expectation of success” to determining obviousness).

bring evidence that there was no expectation of success for the invention before it was made to show that success was not expected, although this can be difficult to prove.⁷⁴

The USPTO noticed the Supreme Court's instruction to go beyond just the TSM test when deciding obviousness, and now the MPEP lists seven exemplary, but not exclusive, rationales for showing obviousness.⁷⁵ These rationales have led to what some call a rebuttable presumption of combinability for analogous art because examiners have many ways to show that combinations would have been obvious.⁷⁶ This implicit presumption of combinability, enabled by the USPTO's new exemplary rationales, makes the determination of analogous art the key step in the obviousness inquiry because once art is determined to be analogous it can be used to show obviousness with minimal further justification.⁷⁷

3. Objective Indicia

Outside of the factors used to analyze prior art—the scope of the prior art, the level of skill in the art, and the differences between the invention and the art, US courts and the USPTO can look to

74. *Compare* Takeda Chem. Indus., Ltd. v. Alphapharm Pty., Ltd., 492 F.3d 1350, 1360–62 (Fed. Cir. 2007) (upholding a district court's finding that there was no reasonable expectation of success, and that the patent in suit was valid), *and* Boston Scientific Corp. v. Johnson & Johnson, 550 F. Supp. 2d 1102, 1116 (N.D. Cal. 2008) (citing an expert's testimony that there was no expectation of success as evidence supporting a patent's validity), *and* Ex Parte Slungaard, No. 2010-011511, 2011 WL 2535211 (P.T.A.B. June 23, 2011) (overturning an examiner's rejection of claims because a hopeful prior art reference suggesting that a particular compound might be toxic did not create a reasonable expectation of success), *with* Bristol-Myers Squibb Co. v. Teva Pharm. USA, Inc., 923 F. Supp. 2d 602, n.36 (D. Del. 2013) (rejecting the patentee's assertion that there was no expectation of success due to toxicity, because toxicity of the substance was not well known at the time of invention), *and* Ex Parte Krishnan, No. 2011-008777, 2011 WL 6739396 (B.P.A.I. Dec. 20, 2011) (rejecting patent applicants' assertion that there was not a reasonable expectation of success, because there was no indication in the prior art that the claimed process was unpredictable).

75. *Compare* UNITED STATES PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2143 (8th ed. Rev. Aug. 5, 2006), *available at* http://www.uspto.gov/web/offices/pac/mpep/old/mpep_E8R5.htm (naming the TSM test as an essential part of a prima facie case of obviousness) *with* MPEP, *supra* note 25, § 2143 (“Note that the list of rationales provided is not intended to be an all-inclusive list. Other rationales to support a conclusion of obviousness may be relied upon by Office personnel.”).

76. *See* Underweiser, *supra* note 68, at 271–76 (summarizing post-KSR decisions by the PTAB evidencing an effective presumption of combinability); Miller, *supra* note 63, at 239 (concluding that the new obviousness standards from *KSR* create a presumption that inventions that combine prior art elements are obvious).

77. *See supra* notes 53-54, 75-76 and accompanying text.

evidence from the market and industry, called objective indicia, to help determine whether an invention was obvious.⁷⁸ Objective indicia reflect actual conditions in a particular field, rather than a fact-finder's view of the field constructed from a few prior art documents or his own perception of inventiveness.⁷⁹ When a patent seems obvious based on the record of prior art, objective indicia can be used as evidence on the other side of the scale to show that the invention was not in fact obvious to skilled persons at the time.⁸⁰ Examples of secondary indicia include: long felt but unsolved need, commercial success of an invention, the failure of others to make an invention, and prior skepticism in the field or industry.⁸¹

Although the Federal Circuit claims that objective indicia can be the most important evidence concerning obviousness, objective indicia rarely overcome a prima facie case of obviousness based on combinations of prior art.⁸² This may partly be due to the fact that the legal rules for considering objective indicia are less developed than the rules for considering prior art.⁸³ Further complicating objective

78. See MPEP, *supra* note 25, § 2141 (guiding examiners to consider all of the Graham factors when deciding obviousness, including secondary considerations); *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 617 F.3d 1296, 1305 (Fed. Cir. 2010) (ruling that “a district court must always consider any objective evidence of non-obviousness presented in a case.”).

79. See *Wieker*, *supra* note 51, at 681 (2008) (suggesting that secondary indicia be given increased importance after *KSR* to avoid subjective judgments by courts); *Thomas*, *supra* note 35, at 2104–05 (suggesting that patents in the mechanical arts are more likely to be found invalid because they are better understood by judges, and that secondary indicia could be used to counter the trend against obviousness findings in the mechanical arts).

80. See *Transocean*, 617 F.3d at 1305 (reversing a district court determination of obviousness based on evidence from secondary considerations); *Patently Non-Obvious I*, *supra* note 22, at 1422 (summarizing an overview of cases from 2004-05, and concluding that very few were decided based on secondary considerations).

81. See *Thomas*, *supra* note 35, at 2077–79 (discussing the different secondary indicia considered in US courts and the rationale behind each); *Durie Lemley*, *supra* note 16, at 1004 (listing different secondary considerations); *Wieker*, *supra* note 51, at 675 (listing the most common secondary considerations).

82. Compare *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1367 (Fed. Cir. 2012) (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983)) (“evidence of secondary considerations may often be the most probative and cogent evidence in the record.”), with *Thomas*, *supra* note 35, at 2085 (summarizing post-*KSR* Federal Circuit cases involving secondary considerations and determining that “secondary considerations were virtually never sufficient” to overcome a finding of obviousness based on the first three Graham factors), and *Durie & Lemley*, *supra* note 16, at 997 (“If the other Graham factors are sufficiently persuasive, the Federal Circuit has been willing to dismiss the potential impact of secondary considerations.”).

83. See *Durie & Lemley*, *supra* note 16, at 996–97 (noting that the Federal Circuit has not clearly defined the role of secondary considerations in determining obviousness of

indicia analysis is the fact that there are often high standards of proof to show a nexus between the evidence of objective indicia and non-obviousness.⁸⁴ This has not stopped some commentators from recommending increased use of objective indicia to help decision makers counteract hindsight, particularly in the wake of *KSR*.⁸⁵ This change need not present much additional work for the USPTO, because most objective indicia favor applicants, and applicants could be relied on to find their own evidence of secondary indicia.⁸⁶

C. Inventive Step in the EPO

Patents in Europe may be obtained through the EPO, which conducts a single examination and issues a separate patent for each contracting state.⁸⁷ The EPO assesses inventive step using the “Problem-Solution” approach.⁸⁸ This approach involves three steps: (1) finding the most promising starting point, or “closest prior art;” (2) identifying the “objective technical problem” solved by the invention; and (3) deciding whether the invention would have been obvious to a PHOSITA trying to solve the objective technical

patents); Thomas, *supra* note 35, at 2106–07 (suggesting that the Federal Circuit could provide better guidance to lower courts on how to consider secondary considerations, and that this would make them more important in decisions).

84. See Wieker, *supra* note 51 at 676–78 (reviewing the proof necessary to show that commercial success and long-felt need are actually related to inventiveness); Thomas, *supra* note 35, at 2090–93 (noting the difficulty of proving a nexus to obviousness from commercial success or professional praise).

85. Wieker, *supra* note 51, at 666 (suggesting that secondary considerations be given increased consideration after *KSR* to ground obviousness decisions); Thomas, *supra* note 35, at 2102 (suggesting that the Federal Circuit give more attention to secondary considerations after *KSR*).

86. See Durie & Lemley, *supra* note 16, at 1004–05 (noting that most objective criteria help applicants/patentees while their absence does not weigh against validity, and that only one kind of objective criteria supports obviousness); Thomas, *supra* note 35, at 2077 (noting that the presence of most objective indicia weigh against finding obviousness).

87. See NATURE AND PURPOSE OF THE EUROPEAN PATENT CONVENTION, EUROPEAN PATENT OFFICE, http://www.epo.org/applying/european/Guide-for-applicants/html/e/ga_a_ii.html (last visited Oct. 23, 2014) (summarizing the function of the EPO and listing contracting states).

88. See EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (“In order to assess inventive step in an objective and predictable manner, the so-called “problem-and-solution approach” should be applied.”); AIPPI GERMANY GROUP REPORT, *supra* note 23, at 6 (stating that the EPO applies the problem-solution approach to determine inventive step).

problem from step two, and starting from closest prior art from step one.⁸⁹

1. Closest Prior Art

In the EPO, the “closest prior art” serves as the benchmark of comparison against which the invention is evaluated for inventive step.⁹⁰ Although the criteria for selecting the closest prior art in the EPO are similar to those for defining analogous art in the United States — the problems addressed by the prior art and the technical field of the invention — there is not an equivalent single benchmark of prior art in the United States.⁹¹

i. Same Purpose or Effect

In order to evaluate inventive step in an objective way, the closest prior art needs to lead a PHOSITA facing the objective technical problem to the invention.⁹² To be chosen as the closest prior art, a prior art reference should be “directed to the same purpose or effect” as the patent or application.⁹³ The formulation of problems does not need to be identical, but must be similar enough that a

89. See EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (describing the three stages of the problem-solution approach to evaluating inventive step); AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 7 (listing the steps of the problem-solution approach as applied at the EPO).

90. See EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (“The closest prior art is that which in one single reference discloses the combination of features which constitutes the most promising starting point for an obvious development leading to the invention.”); CASE LAW OF THE BOA, *supra* note 14, at 169 (describing the closest prior art as whichever reference is the promising starting point to reach the invention).

91. Compare *supra* notes 55–56 and accompanying text, with EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (naming a similar purpose, effect or technical field as the most important criteria for selecting the closest prior art), and CASE LAW OF THE BOA, *supra* note 14, at 168 (stating that shared technical features and being designed to solve similar problems are the often the most important criteria for selecting which reference is the closest prior art).

92. See CASE LAW OF THE BOA, *supra* note 14, at 168 (claiming that prior art with a different purpose cannot be the closest prior art because it would not lead to the invention); EPO GUIDELINES, *supra* note 25, pt. G, VII, at 3 (formulating inventive step analysis as starting from the perspective of a PHOSITA using the closest prior art to solve the objective technical problem).

93. See Case T-0327/92 of the Technical Boards of Appeal of the EPO, at 17 (April 22, 1997) (“[A] document may not qualify as closest prior art to an invention merely because of similarity in the composition of the products, its suitability for the desired use of the invention also had to be described.”); Case T-1519/08 of the Technical Boards of Appeal of the EPO, at 12–14 (Dec. 16, 2011) (rejecting two prior art references as the closest prior art because despite other similarities, they addressed different problems than the patent).

PHOSITA would relate one problem to the finding of a solution to the other.⁹⁴

ii. Most Promising Starting Point

Once prior art with the same or a similar purpose is identified, the closest prior art is chosen based on which document constitutes the most promising starting point to reach the invention in question.⁹⁵ This will, in many cases, be the prior art with the fewest structural and functional differences from the invention.⁹⁶ No matter how structurally and functionally similar a reference is to an invention, it still needs to have the same purpose as the invention to be used as the closest prior art.⁹⁷ In addition to the problem addressed and structural and functional similarities, the field of the invention can be an additional factor supporting a choice for the closest prior art if necessary.⁹⁸

2. Objective Technical Problem

The problem faced by the PHOSITA is used as the motivation for his search through the prior art and his combinations and modifications of prior art.⁹⁹ The EPO uses a particular formulation of

94. See Case T 0327/92 at 17–18 (declining to use a reference as closest prior art despite many similar features because the reference did not suggest a similar purpose); CASE LAW OF THE BOA, *supra* note 14, at 168 (stating that the purpose of an invention is more important than structural similarities when choosing the closest prior art).

95. See CASE LAW OF THE BOA, *supra* note 14, at 169-70 (characterizing the closest prior art as the “most promising springboard” or the “most promising starting point” from which a skilled person might reach the invention); Case T 0452/05 of the Technical Boards of Appeal of the EPO, at 14–15 (Aug. 30, 2006) (choosing the closest prior art based on the prior art reference that came closest to solving the problem of the invention).

96. See CASE LAW OF THE BOA, *supra* note 14, at 168 (claiming that the closest prior art will usually be the reference that requires the fewest structural and functional changes to reach the invention in question); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (“in practice, the closest prior art is generally that which corresponds to a similar use and requires the minimum of structural and functional modifications to arrive at the claimed invention”).

97. See *supra* note 92 and accompanying text.

98. See Case T 0095/92 of the Technical Boards of Appeal of the EPO, at 8 (Aug. 9, 1994) (citing a similar technical field to support the choice of closest prior art); AIPPI NETHERLANDS REPORT, *supra* note 19, at 4 (claiming that the closest prior art should be in the same or a similar technical field as the invention).

99. See AIPPI GERMANY GROUP REPORT, *supra* note 23, at question 14 (noting that the PHOSITA is assumed to be dealing with the objective technical problem and trying to find a solution to it); CASE LAW OF THE BOA, *supra* note 14, at 165 (stating that in the problem/solution approach the skilled person starts with the objective technical problem in mind); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3 (formulating inventive step

the problem called the “objective technical problem.”¹⁰⁰ The objective technical problem looks to the technical effects of the invention as compared to the closest prior art to define the problem that the invention solves.¹⁰¹ The European Patent Convention (“EPC”) requires the originally filed patent application to identify both the problem that the invention solves as well as the invention’s particular solution.¹⁰² The patent application is usually taken as the starting point in formulating the objective technical problem, although the problem will be changed and reformulated if the strict criteria of the objective technical problem are not met.¹⁰³

The EPO requires that an invention actually solve the objective technical problem, and will reformulate the objective technical problem based on the actual effectiveness of the invention if there is no evidence that the problem is solved.¹⁰⁴ An applicant may

analysis as starting from the perspective of a PHOSITA using the closest prior art to solve the objective technical problem).

100. See AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 6–7 (discussing a question about the inventor’s problem in terms of the objective technical problem); CASE LAW OF THE BOA, *supra* note 14, at 165 (defining the problem/solution approach with the PHOSITA using the objective technical problem as a starting point).

101. See AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 6–7 (explaining that the objective technical problem is based on the success of the invention compared to prior art inventions); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 4 (instructing that the objective technical problem is based on the “technical effect” of the invention’s improvements).

102. See Implementing Regulations to Convention on the Grant of European Patents, Rule 42(1)(c), Oct. 5, 1973 (requiring that the description of a patent “disclose the invention, as claimed, in such terms that the technical problem . . . and its solution can be understood, and state any advantageous effects of the invention with reference to the background art”); CASE LAW OF THE BOA, *supra* note 14, at 177 (explaining the requirement that the objective technical problem, whether reformulated or not, must be derivable from the patent application).

103. See AIPPI NETHERLANDS REPORT, *supra* note 19, at 7 (claiming that the formulation of the objective technical problem starts from the description in the patent application); CASE LAW OF THE BOA, *supra* note 14, at 176 (summarizing case law that uses the written description of a patent application as the basis of forming the objective technical problem, except in cases where that formulation was not supported by other evidence).

104. See EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 3-5 (stating that the problem as formulated in a patent application may need to be reformulated based on evidence of the invention’s effectiveness); Case T 0258/05 of the Technical Boards of Appeal of the EPO, at 13 (June 21, 2007) (rejecting the problem as stated in the patent application because there was not evidence that it solved the problem by offering an improvement over the closest prior art); Case T 0355/97 of the Technical Boards of Appeal of the EPO, at 11-12 (July 5, 2000) (rejecting a patentee’s statement of the objective problem because experimental evidence did not show that the invention solved the problem); *id.* at 8-11 (finding that evidence submitted by a patentee did not support the patentee’s claimed problem of improving the production rate of a chemical compound while maintaining purity while because the submissions only showed improvement of the performance index, but did not show that selectivity had been

also amend the claims to a scope commensurate with the demonstrated effects of the invention to avoid reformulation.¹⁰⁵

If there is no evidence that the invention represents an improvement over the prior art, the reformulation of the objective technical problem may be simply “the provision of an alternative product, process or method.”¹⁰⁶ This reformulation can make it easier to find that an invention lacks inventive step, because a more focused problem would focus a PHOSITA’s efforts, while simply finding an alternative means would lead the PHOSITA to consider a wider range of prior art.¹⁰⁷

3. The Could/Would Approach

After identifying the closest prior art and formulating the objective technical problem, the test for inventive step under the EPC asks whether the invention would have been obvious to a PHOSITA before the date of filing.¹⁰⁸ The EPO emphasizes the use of the word

maintained); Case T 0824/07 of the Technical Boards of Appeal of the EPO, at 9-12 (Oct. 5, 2007) (reformulating the applicant’s objective technical problem because the evidence did not show improvement over the closest prior art across all possible material compositions).

105. *See* Convention on the Grant of European Patents art. 123, Oct. 5, 1973, 13 ILM 268 (giving applicants “at least one opportunity to amend the application of [their] own volition.”); Implementing Regulations of the Convention on the Grant of European Patents Rule 137, 161, Oct. 5 1973; Case T 1694/10 of the Technical Boards of Appeal of the EPO, at 2-3 (Jan. 25, 2013) (summarizing the four different versions of a claim presented for examination by a patentee in an opposition proceeding).

106. EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 4; *see* Case T 0355/97, at 11-12 (reformulating the problem motivating a patent from improving the speed of a chemical preparation, to “providing merely a further method for preparing” the chemical); Case T 0258/05, at 9-13 (redefining the objective technical problem for a hair conditioner from increasing hair volume to “[providing] further hair conditioning compositions” because there was no experimental evidence showing that the claimed invention actually increased hair volume better than prior art).

107. *See* Case T 0355/97 at 12-13 (finding a patent obvious after reformulating the problem to be finding an alternate method, and concluding that “the person skilled in the art seeking to solve the less ambitious problem . . . of providing merely a further preparation process, [would] consider routinely any conceivable modification of that known process . . . he would not ignore document (5)”); Case T 0611/07 of the Technical Boards of Appeal of the EPO, at 12-13 (Sept. 18, 2009) (finding a patent non-inventive after redefining the objective technical problem to finding an alternative method).

108. *See* Convention on the Grant of European Patents art. 56, Oct. 5, 1973 (“An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. If the state of the art also includes documents within the meaning of Article 54, paragraph 3, these documents shall not be considered in deciding whether there has been an inventive step.”). Article 54, paragraph 2 includes “everything made available to the public . . . before the date of filing” as prior art, and paragraph 3 also includes other patent applications which were filed before, but published

would as opposed to *could*, summarizing the distinction as follows: “the point is not whether the skilled person could have arrived at the invention by adapting or modifying the closest prior art, but whether he would have done so because the prior art incited him to do so in the hope of solving the objective technical problem.”¹⁰⁹ By asking what a PHOSITA would have done, the EPO requires that a reason in the prior art exist for the PHOSITA to use, modify, or combine prior art references.¹¹⁰

Addressing the same or a similar problem is a key consideration that would lead a PHOSITA to look to a prior art reference, and if a prior art document addresses a different problem than the invention it can be precluded from being asserted against a patent, even if it has similar features.¹¹¹ A PHOSITA can also be motivated to combine references if the references are from similar technical fields as the invention, and the relation of the fields would cause a PHOSITA to look to a neighboring field for solutions to the problem.¹¹² General technical knowledge, which is common to a field

after, the filing date as prior art for purposes of novelty. *Id.* at art. 54. Article 56 excludes paragraph 3 prior art from the consideration of inventive step, so inventive step analysis takes place from a pre-filing perspective. *Id.* at art. 56.

109. See EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 5.

110. See Case T 0414/98 of the Technical Boards of Appeal of the EPO, at 15 (Nov. 30, 2009) (stating that there must be “hints or clues” leading to the invention in the prior art in order to show a lack of inventive step); AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 4 (describing the EPO approach to combining prior art references as requiring a motivation to combine, except in the case of common general knowledge represented by textbooks or dictionaries).

111. See Case T 0218/07 of the Technical Boards of Appeal of the EPO, at 8–9 (Dec. 11, 2008) (holding that a prior art document with similar features did not render the patent in suit obvious because the document addressed a different problem than the invention, and would therefore not lead a PHOSITA to use the teaching of that prior art to solve his problem); Case T 1519/08 of the Technical Boards of Appeal of the EPO, at 18 (Dec. 16, 2011) (concluding that a PHOSITA would not have combined prior art documents to reach the invention because the documents were addressed to different problems than the invention).

112. See Case T 0095/92 of the Technical Boards of Appeal of the EPO, at 13 (Aug. 9, 2004) (deciding that a PHOSITA working in the “field of security checks on bank notes must be presumed to be aware of the techniques employed in the field of tape recorders insofar as these employ the same basic principles of detection” because a prior art document discussed the applicability of the latter art to the former); Case T 0516/08 of the Technical Boards of Appeal of the EPO, at 11 (Dec. 16, 2009) (holding that a PHOSITA would use a prior art document not directed towards the same problem, but in the same field as the invention). *But see* Case T 1479/08 of the Technical Boards of Appeal of the EPO, at 9–11 (May 3, 2011) (concluding that a PHOSITA would not look to two prior art documents disclosing similar methods to the patent in suit because they were from unrelated fields and did not address themselves to similar problems as the invention).

of art, can easily be combined with other prior art, and need only be cited if challenged.¹¹³

Prior art documents need to be technically compatible with each other for a PHOSITA to consider combining their teachings into one solution to the problem, because otherwise their incompatibility would lead a PHOSITA away from combining them.¹¹⁴ As with combining prior art, the PHOSITA needs a motivation from the prior art to modify a single prior art reference to reach an invention.¹¹⁵

4. Secondary Indicators in the EPO

Secondary indicators in the EPO are the equivalent of objective indicia in the United States, and can include commercial success, skepticism, long-felt need, and unexpected results.¹¹⁶ In the EPO, secondary indicators cannot replace the technical analysis of inventive step detailed above, but they can reinforce other findings or tip the scales in a close case.¹¹⁷ An important feature of secondary

113. *See generally* EPO GUIDELINES, *supra* note 25, pt. G, ch. VII (outlining the use of common general knowledge in the EPO); CASE LAW OF THE BOA, *supra* note 14, at 74-75 (discussing evidence needed to support general knowledge).

114. Case T 1629/08 of the Technical Boards of Appeal of the EPO, at 9 (Sept. 21, 2010) (holding that a PHOSITA would not use a prior art document because its teaching was incompatible with the closest prior art); Case T 0447/06 of the Technical Boards of Appeal of the EPO, at 26 (Sept. 10, 2008) (holding that a PHOSITA would not have reached the invention by combining prior art reference with the closest prior art because the method disclosed by the reference, while effective in some respects, was known to have other undesirable effects incompatible with the goals of the invention).

115. *See* Case T 1519/08 of the Technical Boards of Appeal of the EPO, at 17-18 (Dec. 16, 2011) (concluding that, because there was no motivation or incentive to do so, a PHOSITA would not have changed an important feature of a single prior art document to arrive at the invention); CASE LAW OF THE BOA, *supra* note 14, at 182-83 (stating that a PHOSITA needs some prompting or expectation of advantages based in the prior art to render an invention obvious).

116. *See supra* note 81 and accompanying text; AIPPI NETHERLANDS REPORT, *supra* note 19, at 10-11 (explaining the use of secondary considerations in the EPO); CASE LAW OF THE BOA, *supra* note 14, at 224-29 (reviewing EPO case law on secondary indicators, organized by each type of evidence); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 9-10 (reciting secondary considerations used in the EPO).

117. *See* CASE LAW OF THE BOA, *supra* note 14, at 223-24 (explaining that secondary indicia are of secondary importance to the problem/solution approach for determining the presence of inventive step); Case T 1397/07 of the Technical Boards of Appeal of the EPO, at 20-21 (May 6, 2010) (restating the rule that secondary indicia cannot support inventive step alone, and upholding the decision that the invention lacked inventive step despite evidence of commercial success); Case T 0677/91 of the Technical Boards of Appeal of the EPO, at 16 (Nov. 3, 1992) (relying on commercial success and praise of the invention's advantages as a breakthrough invention to support finding inventive step).

indicator evidence is that the evidence must not be caused by some influence other than the technical features of the invention, and may require high standards of proof to be taken as evidence of inventiveness.¹¹⁸

II. HINDSIGHT IS 20/10

Part II compares how the law of the United States and the EPO are vulnerable to hindsight bias, and how each patent system attempts to address hindsight bias in its legal tests. Part II evaluates and compares each part of the inventive step analysis, first with the starting point in the prior art, then with the definition of the inventor's problem, the process of modifying and combining prior art references, and finally with the objective indicia and secondary considerations. It is important to remember that US Courts, the USPTO, and the EPO acknowledge that hindsight is an unacceptable basis for a patent examination or validity decision.¹¹⁹

A. Starting Point in the Prior Art, The Benchmark of Comparison

This part of the inventive step analysis is where a PHOSITA would start the inventive process given the problems he faced and is where a patent examiner or a court actually begins its analysis of inventive step or obviousness. It is the benchmark against which the invention is judged. The danger of hindsight here is that an examiner may be led by the invention to a starting point that would not have been obvious to a PHOSITA given the problems faced.¹²⁰

The EPO usually selects a single closest prior art reference that serves as the starting point.¹²¹ This is selected first based on having the same purpose as the invention, with structural and

118. See CASE LAW OF THE BOA, *supra* note 14, at 228 (noting that commercial success must be caused by technical features, not effective marketing or advertising); *id.* at 224 (noting high standards of proof to show “technical prejudice” against an invention); *id.* at 227 (noting the need to prove the existence of a long-felt need or desire to improve a technology); AIPPI NETHERLANDS REPORT, *supra* note 19, at 10–11 (explaining the need for proof of secondary considerations in the EPO).

119. See *supra* notes 25–27 and accompanying text.

120. AIPPI GERMANY GROUP REPORT, *supra* note 23, at question 28 (referring to a German decision criticizing the choice of closest prior art in the EPO as influenced by hindsight knowledge of the nature of the invention); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII at 8 (cautioning examiners that references found in a prior art search are found with “foreknowledge of what matter constitutes the alleged invention”).

121. See *supra* note 90 and accompanying text.

functional similarities used to select among prior art with similar purposes.¹²² Selecting the closest prior art primarily based on its purpose helps examiners avoid hindsight that might be present if the closest prior art were selected based primarily on structural similarities.¹²³ Using structural and functional similarities to select the closest prior art can be prone to hindsight because the structure and function of an invention are only determined once it has been developed and a particular structure may not have been obvious at first.¹²⁴ Despite these risks of hindsight the method of selecting of the closest prior art in the EPO is justified by other concerns. It is acceptable for the EPO to choose a prior art reference that the inventor did not consider a promising starting point because a patent must be inventive with respect to the starting point that a PHOSITA would have used, not just what the inventor actually used as a starting point.¹²⁵

In the United States, examiners will often refer to a prior art reference as “primary” when it has the most features in common with the invention, and other combined references will be referred to as “secondary,” “tertiary,” and so on.¹²⁶ These designations, however, are for convenience and have no legal significance, and any

122. See *supra* notes 92–98 and accompanying text.

123. See Case T 0246/04 of the Technical Boards of Appeal of the EPO, at 50–51 (July 12, 2007) (“in order to avoid ex-post facto considerations, the closest state of the art is not generally that merely showing superficially the most similarities, but rather that conceived for solving the same primary problem or aiming at the same objective as the claimed invention and which requires the minimum of structural and functional modifications”); CASE LAW OF THE BOA, *supra* note 14, at 169 (reviewing cases where a reference could not be used as the closest prior art because it did not address a similar problem as the invention, and concluding that hindsight must have been used to select such references as the closest prior art).

124. AIPPI GERMANY GROUP REPORT, *supra* note 23, at question 28 (referring to a German decision criticizing the choice of closest prior art in the EPO as influenced by hindsight knowledge of the nature of the invention); Case T 0246/04 at 50–51 (explaining that the importance of a similar purpose to the selection of closest prior art is meant to avoid hindsight).

125. See CASE LAW OF THE BOA, *supra* note 14, at 167 (“The determination of the closest prior art is therefore an objective and not a subjective exercise.”); see Eisenberg, *supra* note 44, at 897–98 (arguing that PHOSITAs in many instances should be taken to have knowledge beyond just that disclosed in the prior art); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 1 (stating that a PHOSITA is presumed to have general knowledge in the field and be aware of all prior art revealed in the search report).

126. See, e.g., Ex parte Wheeler, No. 2012-002215, 2013 WL 5866443 at *8 (P.T.A.B. Oct. 29, 2013) (referring to a combination of primary, secondary, tertiary, and quartinary references); Ex parte Kim, No. 2011-012867, 2013 WL 3355940 at *5–7 (P.T.A.B. June 10, 2013) (discussing combinations of primary, secondary, and tertiary prior art references).

analogous prior art can be the basis of an obviousness argument.¹²⁷ Ignoring the inventor's state of mind, and using any prior art that a PHOSITA might have used as the benchmark of comparison, is justified in the United States by a concern for objectivity, as it is in Europe.¹²⁸

B. *The Problem an Inventor is Trying to Fix*

When trying to determine what a PHOSITA would have done, it is important to consider the PHOSITA's motivations when making inventions, and both the United States and the EPO use problems in the prior art as the motivation for a PHOSITA's work.¹²⁹ The formulation of this problem, however, differs significantly between the United States and Europe.

The EPO takes a very rigid approach to forming the inventor's problem, and bases its formulation on the effects of the finished invention.¹³⁰ The EPO's rigid approach to defining the objective technical problem is based on concerns that the problem be defined in an objective manner, and not in a way specific to a particular inventor.¹³¹ The EPO addresses this objectivity problem by

127. See, e.g., *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012) (citations omitted) (“[W]here the relevant factual inquiries underlying an obviousness determination are otherwise clear, characterization by the examiner of prior art as ‘primary’ and ‘secondary’ is merely a matter of presentation with no legal significance.”); *Ex parte Wheeler*, 2013 WL 5866443 at *15 (explaining that the combination of references and features is important, not how they are characterized as primary, secondary, or tertiary and so on).

128. See *supra* note 125 and accompanying text.

129. See *KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) (explaining that any need or problem known in the field of art can motivate the PHOSITA to combine features found in the prior art); *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994) (reasoning that the similarity of problems addressed by prior art would lead a PHOSITA to consider many kinds of hinges and fittings analogous to laptop computer hinges); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 4 (describing the objective technical problem as the “aim and task” making an improvement over the prior art). Compare *supra* notes 60–61 and accompanying text, with *supra* note 99 and accompanying text.

130. See *supra* notes 99–105 and accompanying text.

131. See Case T 0039/93 of the Technical Boards of Appeal of the EPO, at 14–15 (Feb. 14, 1996) (defining the subjective technical problem as the problem understood by the patent applicant and disclosed in the patent application, and contrasting it with the objective technical problem which is based on “objectively relevant elements” that may have been beyond the consideration of the applicant); CASE LAW OF THE BOA, *supra* note 14, at 166 (defining the technical problem as an objective finding, defined in terms of the inventor's demonstrated advances over prior art techniques).

basing the inventor's problem on the actual effects of the invention.¹³² The formulation of the objective technical problem can incorporate hindsight into the EPO's approach because it uses the invention (ex post information) to define the problem that motivates an invention's development (an ex ante fact).¹³³ The EPO is not unaware of the potential for hindsight in the formulation of the objective technical problem, and EPO materials admonish examiners against forming the objective technical problem in a way that points to the solution.¹³⁴

The approach to the inventor's problem in the United States is quite different because the USPTO and courts in the United States can use any problem that was recognized in the field at the time of invention as motivation for a PHOSITA.¹³⁵ Like the EPO, the USPTO is not limited to using the problem as defined by an inventor in his application, so concerns with subjectively defining the problem are still addressed with the US approach.¹³⁶ These two methods of formulating the problem are quite different because the US method puts the focus squarely on ex ante facts about what problems were motivating people at the time the invention was developed and away

132. See Case T 1621/08 of the Technical Boards of Appeal of the EPO, at 18 (Sept. 17, 2010) (refusing to use the problem as proposed by the patentee because there was no evidence that the invention achieved a solution to that problem); *supra* notes 99–105 and accompanying text.

133. See AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 12 (referring to a Dutch court decision that criticized the EPO's method of identifying the objective technical problem); CASE LAW OF THE BOA, *supra* note 14, at 176 (admitting that the formulation of the objective technical problem can contain pointers to the solution, and warning against such formulations as hindsight).

134. See CASE LAW OF THE BOA, *supra* note 14, at 176 (summarizing case law deciding that “the technical problem addressed by an invention had to be formulated in such a way that it did not contain pointers to the solution or partially anticipate the solution”); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 4 (“[T]he objective technical problem must be so formulated as not to contain pointers to the technical solution . . .”).

135. See *KSR*, 550 U.S. at 420 (“any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”); *Norgen Inc. v. Int’l Trade Comm’n*, 699 F.3d 1317, 1326–27 (Fed. Cir. 2012) (upholding a finding of obviousness based on a problem identified in the prior art that would lead a PHOSITA to the claimed invention); MPEP *supra* note 25, § 2141.01(a).

136. See *KSR*, 550 U.S. at 420 (“The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve.”); *Norgen*, 699 F.3d at 1323 (explaining that any problem known in the industry can motivate a combination of prior art, including, but not limited to the problem motivating the patentee).

from ex post constructions based on the invention as is typically done in the EPO.¹³⁷

C. Modifying and Combining Prior Art

Modifications and combinations of prior art are where everything comes together in a determination of obviousness. Through the analogous art test, and the many rationales for combining prior art, the United States uses both the field of art and the problem faced by the inventor as justifications to combine prior art.¹³⁸ The EPO uses the same justifications to combine in the could/would approach.¹³⁹

The EPO Guidelines address the issue of hindsight bias most directly in the context of combining the prior art.¹⁴⁰ The EPO attempts to minimize the hindsight involved in using prior art that was found in a search conducted with knowledge of the invention by requiring a reason to show why a PHOSITA would have combined references.¹⁴¹ As in the United States, implicit motivation and general knowledge, as well as explicit mention of a similar problem, can provide sufficient motivation for an examiner to combine prior art and render a patent obvious.¹⁴² This makes the assessment of combinability essentially the same in the United States as in the EPO: references from the same field or addressing similar problems will probably be combined to show obviousness.

137. See *supra* notes 99–105, 133–36 and accompanying text.

138. See *supra* notes 53–56, 75–77 and accompanying text.

139. See *supra* notes 111–12 and accompanying text.

140. See CASE LAW OF THE BOA, *supra* note 14, at 184 (warning that the risk of ex post facto analysis is particularly high with inventions that combine elements from different prior art references); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 8 (warning examiners that “the documents produced in the search have, of necessity, been obtained with foreknowledge of what matter constitutes the alleged invention [And that examiners] should attempt to visualize the overall state of the art” including negative teachings).

141. See CASE LAW OF THE BOA, *supra* note 14, at 183 (summarizing how the “could/would approach” is meant to avoid “ex post facto” analysis of patents and applications); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 5 (emphasizing the difference between what a PHOSITA could have done, and what he would actually have done, given motivation to improve what was found in the prior art).

142. See Case T 0257/98 of the Technical Boards of Appeal of the EPO, at 17 (Sept. 3, 2002) (incorporating an implicit teaching from a prior art reference as a motivation for a PHOSITA into a holding of obviousness); Case T 0412/09 of the Technical Boards of Appeal of the EPO, at 11 (May 9, 2012) (combining the closest prior art with “common general knowledge” to find a claim obvious).

There is, however, an important difference between the approaches in the two systems. EPO patent rejections based on lack of inventive step are usually based on a combination of only two prior art references, and, with a few limited exceptions, the need to combine more than two references can tend to show inventiveness instead of obviousness.¹⁴³ The EPO even warns its examiners that prior art references found in a patent office search are particularly vulnerable to hindsight because the search is based on knowledge of the invention.¹⁴⁴ Practice in the USPTO is different, where combinations of three or four prior art references are common.¹⁴⁵

D. *Objective Indicia*

Outside evidence like objective indicia or secondary indicators could provide a helpful check on hindsight in patent decisions. Both the USPTO and the EPO will consider objective indicia if it is brought before an examiner. Neither office, however, gives this evidence much weight when compared with the other parts of the inventive step/obviousness analysis. The EPO is straightforward with the fact that objective indicia are not as important as the problem-solution approach, and can only tip the scales in close cases.¹⁴⁶ By contrast, the Federal Circuit has claimed that objective indicia can be the most important evidence of obviousness, but rarely makes a decision based on objective indicia.¹⁴⁷ The range of secondary indicators considered is similar in

143. See AIPPI NETHERLANDS GROUP REPORT, *supra* note 19, at 5–6 (explaining that more than two references can show an inventive step, and explaining the exceptions to that rule); EPO GUIDELINES, *supra* note 25, pt. G, ch. VII, at 7 (“[T]he fact that more than one disclosure must be combined with the closest prior art in order to arrive at a combination of features may be an indication of the presence of an inventive step”); AIPPI GERMANY GROUP REPORT, *supra* note 23, at question 12 (noting that combining more than one reference with the closest prior art can signal the presence of an inventive step).

144. See *supra* notes 140–41 and accompanying text.

145. See *supra* note 126; see also, e.g., *Ex parte Laborbe*, No. 2011-004895, 2013 WL 3323585 at *3-4 (P.T.A.B. May 23, 2013) (upholding rejections based on combining more than two prior art documents); *Ex parte Decesare*, No. 2011-008327, 2012 WL 5772507 at *5 (P.T.A.B. Nov. 14, 2012) (upholding an examiner’s rejection of a claim “as obvious over Allardyce, as evidenced by D’Ottavio, and further in view of the admitted state of the prior art, Okuhama and Pender, and further in view of Stevens”).

146. See CASE LAW OF THE BOA, *supra* note 14, at 223–24 (“Secondary indicia of this kind are only of importance in cases of doubt”); Case T 0465/97 of the Technical Boards of Appeal of the EPO, at 28 (Mar. 14, 2001) (“[S]econdary indicia like a prejudice in the art are merely ‘auxiliary considerations’ in the assessment of inventive step”).

147. See *supra* note 82 and accompanying text.

both systems, as is the need for proof of a connection to inventiveness.¹⁴⁸

Hindsight bias can enter into the inventive step analysis at many stages. The choice of a benchmark prior art reference can incorporate hindsight if it is based on the structure of the invention without reference to what people in the field thought was a promising starting point. Similarly, hindsight exists where the formulation of the problem motivating an inventor is based on the achievements of the invention without being grounded in what were actually recognized as problems at the time of invention. Combinations of features in prior art may seem obvious once proven successful only because the invention proved them successful. Finally, objective indicia and secondary considerations can provide a useful counter-balance to the temptation of hindsight, but are not given very much weight by the USPTO or EPO systems.

III. IMPROVEMENTS VIA TRANS-ATLANTIC SHARING

Part III recommends improvements to each component of inventive step analysis based on the insights gained from comparing the EPO and US practices. Specifically, the EPO should adopt the US approach to the inventor's problem, and the United States and EPO should implement new procedures for combining prior art references. Both systems should also give increased weight and respect to objective indicia/secondary considerations in obviousness decisions.

A. *The Inventor's Problem*

The EPO should adopt the US approach to defining the problems faced by inventors by focusing on problems recognized in an industry before a patent is filed. While the general thrust of the inventor's problem is usually fairly clear, the expression of that problem can point to the invention as a solution.¹⁴⁹ This creates an issue of hindsight bias in the assessment of whether the invention is obvious, particularly with how the EPO forms the objective technical

148. See *supra* notes 81, 84, 116–18 and accompanying text.

149. See CASE LAW OF THE BOA, *supra* note 14, at 176 (admitting that the formulation of the objective technical problem can contain pointers to its solution, and warning against such formulations).

problem in a way that is based on the invention.¹⁵⁰ Focusing on the state of the field of art before the invention and the alternate possibilities helps to correct the influence of hindsight in the analysis of the PHOSITA's motivation.¹⁵¹ The rigid nature of the objective technical problem in the EPO is based on a concern for objectivity.¹⁵² These concerns about relying on the "subjective" problem are addressed because any problem or demand that was known in the art can be used, and the problem actually present in an inventor's mind is not given special treatment.¹⁵³ By adopting the approach used in the United States, the EPO can address objectivity concerns and reduce the influence of hindsight by looking to recognized pre-invention problems.

B. *Combining Prior Art*

To address problems of hindsight when combining prior art, this Note proposes implementing procedures requiring examiners to articulate reasons why any particular combination might not have been used by a PHOSITA. Developing reasons for alternative outcomes has been shown to help alleviate hindsight bias by moving the evaluator closer to a pre-knowledge mindset.¹⁵⁴ Hindsight is a danger in this phase of inventive step analysis because it is easy for combinations of prior art to seem obvious once the desired outcome is known.¹⁵⁵ Combinations of art are particularly vulnerable to hindsight because the prior art revealed by a prior art search is informed by the nature of the invention and its features.¹⁵⁶ This problem is compounded in the United States by the use of three or more

150. See AIPPI GERMANY REPORT, *supra* note 23, at question 15 (stating the importance of avoiding pointers to the solution to avoid ex post facto analysis); AIPPI NETHERLANDS REPORT, *supra* note 19, at 15 (noting the importance of forming the objective technical problem without pointers to the solution to making a hindsight free determination).

151. See *supra* note 150 and accompanying text; Davies, *supra* note 42, at 92 (noting that considering alternative possibilities can reduce the effects of hindsight bias).

152. See *supra* note 131 and accompanying text.

153. See *supra* notes 135–36 and accompanying text; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) (“[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”); *Norgren Inc.* 699 F.3d 1317, 1326–27 (Fed. Cir. 2012) (holding a patent obvious because it was obvious in light of a long known problem in the industry).

154. See *supra* note 43 and accompanying text.

155. See *supra* notes 123–24, 141 and accompanying text.

156. See *supra* notes 123–24, 141 and accompanying text.

references to show obviousness.¹⁵⁷ Requiring examiners to articulate reasons in favor of and against each proposed prior art combination would help to put references in context, in addition to shifting the mental perspective of the examiner as demonstrated by psychological research.¹⁵⁸

C. Objective Indicia

Given that objective indicia reflect the real facts on the ground, not influenced by hindsight, their limited use and importance in obviousness decisions on both sides of the Atlantic is somewhat surprising.¹⁵⁹ Both the United States and the EPO could both benefit from increased use and reliance on objective indicia, which are often, as the Federal Circuit has recognized, the most direct evidence of how a particular invention is viewed by experts in its field.¹⁶⁰ The small weight given to objective indicia is perhaps because many objective indicia are complicated by potential confounding factors that must be ruled out before they can be accepted as evidence of inventiveness.¹⁶¹ When these burdens of proof are met, both patent systems should give objective indicia and secondary considerations greater weight. In addition to giving these considerations more weight, clearer legal rules establishing the proof necessary to accept objective indicia as evidence of obviousness, and how they should be weighed in the whole obviousness analysis, would help examiners, courts, and practitioners to use and rely on objective indicia with confidence.¹⁶²

CONCLUSION

It is easy in patent law to judge the achievements of the past from the vantage of the present, with the gift of hindsight. To be fair to the work of inventors and encourage innovation, it is important to avoid this pitfall. The legal systems in Europe and the United States

157. See *supra* note 145 and accompanying text.

158. See *supra* note 43 and accompanying text.

159. See Wieker, *supra* note 51, at 674 (noting that objective indicia can provide real world information about the circumstances of inventions); Thomas, *supra* note 35, at 2073 (noting that objective indicia actual reflect industry conditions).

160. See *supra* note 82 and accompanying text.

161. See *supra* notes 83, 118 and accompanying text.

162. See Wieker, *supra* note 51, at 683 (noting criticism of objective indicia because their legal importance is difficult to determine); Thomas, *supra* note 35, at 2106-07 (hoping that more decisions from the Federal Circuit based on objective indicia would provide guidance and help lower courts to apply objective indicia in patent cases).

both attempt to avoid this trap. As detailed above, however, both could also do more to avoid the problem of hindsight, while still addressing other legitimate policy concerns. A hybrid model that adopts the US model of finding problems known in the field includes serious consideration by the evaluator of why references might not have been combined, and gives increased weight to objective indicia and secondary considerations would help reduce the influence of hindsight in the United States and in Europe and help bring both systems closer to their ideal of a hindsight free patent system.