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WAS THE TELESCOPE OBVIOUS? AN INQUIRY
INTO SIMULTANEOUS INVENTION[†]

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History is full of inventions that multiple people appear to have arrived at independently at about the same time, from the telescope (Lippershey, Metius, and others, 1608) to the telegraph (Morse, Steinheil, and others, 1837). Simultaneous independent invention is so common that some commentators have wondered if inventions are inevitable, the byproduct of existing culture rather than the work of individual genius. This philosophical problem has important practical implications in intellectual property law, which is deeply conflicted on the issue. On the one hand, the Patent and Trademark Office has procedures in place to award a patent to the winner of a race between two or more groups for the same invention. On the other hand, the Federal Circuit recently confirmed that simultaneous independent invention can indicate that the idea was obvious and nobody deserves to patent it. This Article explores this conflict, including recent case developments, and suggests a potential resolution.

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I. INTRODUCTION

The Federal Circuit recently confirmed a long-standing doctrine that a patent may be invalid for obviousness if multiple people independently invent the same thing at around the same time—including *after* the priority date of the patent at issue.² This doctrine, while venerable, is problematic, as the Federal Circuit itself has recognized. For one thing, the United States Patent and Trademark Office has long had administrative procedures in place to resolve disputes as to who invented something first. Could it be that the existence of the dispute itself means that nobody wins?³

But there is an even deeper problem, one that the Federal Circuit has not discussed. An uncanny number of inventions—some would even argue the majority of inventions—have near-simultaneous independent inventors. This is because a large (and ever-growing) number of scientists and engineers are all working along the same technological boundary, often using the same tools and asking similar questions. The wheelbarrow could not be invented before the wheel, but once the wheel was invented, the wheelbarrow could not be far behind. This essential property of technological progress raises fascinating and difficult questions for the patent system in determining if an inventor should be rewarded for being the first to assemble the wheelbarrow, or turned away for laying claim to something that would surely have been invented anyway.

2. *Geo M. Martin Co. v. Alliance Mach. Sys. Int'l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010) (citing *Concrete Appliances Co. v. Gomery*, 269 U.S. 177, 184 (1925)).

3. See *Lindemann Maschinenfabrik v. Am. Hoist*, 730 F.2d 1452, 1460–61 (Fed. Cir. 1984) (discussing apparent tension between interference practice and simultaneous invention doctrine). Once the recently enacted America Invents Act is fully implemented, interference proceedings, which relate to priority disputes, will be replaced with derivation proceedings, which are limited to allegations that an inventor derived a claimed invention from someone else.

Part II of this Article discusses some of the history and theory of simultaneous independent invention, contrasting a “heroic” model of invention that focuses on the individual genius, and a “cultural” model of invention that understands innovation as a social process. The next part takes a closer look at the law of obviousness in light of the tension between the cultural and heroic models of innovation. The last part offers some possibilities for refining the current doctrine surrounding simultaneous invention.

II. CULTURAL AND HEROIC MODELS OF INVENTION

A. Sunspots and Telescopes

In 1611, Italian astronomer Galileo made the astonishing observation of spots on the sun, contradicting ages of popular belief and religious orthodoxy that the sun was unblemished. But Galileo was not alone. Within that same year at least three other astronomers, all working independently in three different countries, also discovered sunspots.⁴

Why, after millennia of humans gazing up at the sky, did four astronomers discover sunspots almost simultaneously? The answer, it turns out, is not so mysterious. The telescope had just been invented in Holland in 1608, with credit for the invention traditionally attributed to a spectacle-maker named Hans Lippershey.⁵ It was only a matter of time before the invention was disseminated across Europe and astronomers thought to train it on a rather prominent celestial object.⁶ In fact, several independent discoverers of sunspots used a similar technique of projecting an image of the sun on a screen behind the eyepiece.⁷ So perhaps the discovery of sunspots was inevitable, the result of an advance in telescope technology combined with an obvious modification—projection of the

4. Steven Johnson, *Where Good Ideas Come From* 34 (2010).

5. Henry C. King, *History of the Telescope* 30 (1955).

6. News of the invention spread quickly, but not quite at Twitter speed. Galileo wrote in his treatise, *Sidereus Nuncius*, “About 10 months ago a rumor came to our ears that a spyglass made by a certain Dutchman by means of which visible objects, although far removed from the eye of the observer, were distinctly perceived as though nearby. About this truly wonderful effect some accounts were spread abroad, to which some gave credence while others denied them. The rumor was confirmed to me a few days later by a letter from Paris This finally caused me to apply myself totally to investigating the principles and figuring out the means by which I might arrive at the invention of a similar instrument, which I achieved shortly afterward on the basis of the science of refraction.” Galileo Galilei, *Sidereus Nuncius* or *The Sidereal Messenger* 36–37 (Albert Van Helden trans. 1989) (footnotes omitted).

7. King, *supra* note 5, at 40.

image onto a screen—that was within the grasp of any astronomer of ordinary skill.

If this is the case, perhaps the true accolades should go to Lippershey, who invented the telescope that made the simultaneous discoveries of sunspots possible. As with the sunspots, however, the story of a lone inventive genius is problematic. According to one history of the telescope, “there is still doubt as to the name of the inventor, for the idea seems to have germinated in several minds at once.”⁸ Indeed, at the same time that Lippershey applied to the Dutch government for a patent, two other claimants also sought patents on similar devices.⁹ There is even a story that Lippershey himself got the idea from his children, who were playing in Lippershey’s spectacle shop and found that with two lenses they could make a nearby church appear much larger.¹⁰

The story of the child inventors, while apocryphal, is believable to anyone who has watched children play. It seems that once the right kinds of lenses were available, someone was bound to notice the magnifying effect of peering through two of them at once. Why did a number of people appear to notice this effect all around the same time, and all well after lenses were first developed?

The answer, once again, appears to lie in the technological and historical context. An effective telescope of the configuration used by the earliest astronomers requires a weak convex lens in combination with a strong convex or concave lens.¹¹ Lenses had been around throughout the sixteenth century, and plenty of people were aware of the small magnifications that could be achieved with various combinations of lenses.¹² A sufficient range of lens strengths to create a magnification that someone might find useful for gazing at the sky (which one historian pins at approximately 2x) did not become available until the early 1600s, exactly when the multiple claims of invention of the telescope started cropping up.¹³

Simultaneous independent advances in science and engineering are not unique to sunspots or telescopes. Patent practitioners are well aware that independent, near-simultaneous claims of invention are common. In the author’s experience, virtually no patent is litigated without the accused infringer mounting a significant defense that the patent is either anticipated under 35 U.S.C. § 102 (i.e.,

8. *Id.* at 30. Another history, reviewing various claims of invention, concludes, “we may never know the identity of the inventor(s) of the telescope” Albert Van Helden, *The Invention of the Telescope*, 67 *Transactions of the American Philosophical Society* 5, 9 (1977).

9. Van Helden, *supra* note 8, at 21.

10. King, *supra* note 5, at 30.

11. Van Helden, *supra* note 8, at 15–18.

12. *Id.* at 18.

13. *Id.* at 19–20.

someone came up with the invention first), or at least obvious under 35 U.S.C. § 103 (i.e., all of the elements were already there and it was obvious to put them together). Moreover, the closest prior art is frequently dated very near in time to the date of priority claimed by the patentee as multiple groups race for the same invention. Because the United States has historically used a first-to-invent rather than a first-to-file rule for patent priority,¹⁴ patent lawsuits commonly involve intense factual disputes of exactly who scribbled what into his or her notebook and when. As the patent system transitions to a first-to-file system, the difficult task of identifying the moment of invention will fade into the background.¹⁵ The battles over whether the patents were novel and non-obvious relative to the prior art as of the filing date will, of course, continue.

B. Patents Are Commonly Granted to the Winner of a “Race to Invent”

A well-known historical example of a race to invent in the annals of patent disputes concerned the inventor of the telegraph, a contest that the United States Supreme Court ultimately decided in favor of Samuel Morse.¹⁶ The Supreme Court’s recounting of the relevant events repeats precisely the pattern of sunspots and telescopes: a scientific breakthrough leads a lot of people to thinking in the same direction, resulting in a flurry of near-simultaneous independent invention.

In the case of the telegraph, the prerequisite breakthrough was the harnessing of electromagnetism. As Chief Justice Taney explained in his 1853 opinion,

It is obvious that, for some years before Professor Morse made his invention, scientific men in different parts of Europe were earnestly engaged in the same pursuit. Electro-magnetism itself was a recent discovery, and opened to them a new and unexplored field for their labors, and

14. See 35 U.S.C. § 102(a) (2006) (tying priority of a patent to “the invention thereof by the applicant”).

15. Recently enacted patent reform has moved the country toward a first-to-file system, generally by redefining prior art, with certain exceptions, as disclosures prior to the filing date of the patent. See Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3 125 Stat. 284, 285–286 (2011) (to be codified at 35 U.S.C. § 102). Implementation of this change is delayed for eighteen months from enactment of the act. *Id.* § 3(n).

16. *O’Reilly v. Morse*, 56 U.S. 62 (1853). Today, this case is chiefly noted among patent scholars for its early efforts to struggle with the limits of what can be patented and what are “natural” phenomena that belong to the public. See A. Iancu and P. Gratzinger, *Machines and Transformations: The Past, Present, and Future Patentability of Software*, 8 Nw.J. Tech. & Intell. Prop. 247, 251–52.

minds of a high order were engaged in developing its power and the purposes to which it might be applied.¹⁷

According to the Court, soon after the scientific community started to learn how to manipulate electromagnetism around 1819–1820, “it was believed by men of science that this newly discovered power might be used to communicate intelligence to distant places.”¹⁸ In fact, “in the year 1832, when Professor Morse appears to have devoted himself to the subject, the conviction was general among men of science everywhere that the object could, and sooner or later would be, accomplished.”¹⁹

The great engineering challenge of the telegraph, the Court went on to explain, was to overcome the fact that electrical current seemed to quickly dissipate over distance.²⁰ Given that “many eminent and scientific men in Europe, as well as in this country, became deeply engaged in endeavoring to surmount” this challenge, the Court observed, “it ought not to be a matter of surprise that four different magnetic telegraphs, purporting to have overcome the difficulty, should be invented and made public so nearly at the same time that each has claimed a priority. . . .”²¹ The Court then noted that the inventions “were so nearly simultaneous, that neither inventor can be justly accused of having derived any aid from the discoveries of the other.”²²

The Court seemed untroubled by the idea that the near-simultaneous independent solution to a common problem would indicate that the solution was obvious. Instead, upon an extensive review of the evidence, the Court concluded that “it is evident that the invention of Morse was prior to that of Steinheil, Wheatstone, or Davy.”²³ The Court also set aside any concerns that Morse was part of and in correspondence with a broader scientific community that was working on the same problem.

Neither can the inquires he made, or the information or advice he received, from men of science in the course of his researches, impair his right to the character of an inventor. . . . For a very high degree of scientific knowledge and the nicest skill in the mechanic arts are combined in [the invention], and were both necessary to bring it into successful operation. And the fact that Morse sought and obtained the necessary information and counsel from the

17. *Morse*, 56 U.S. at 106.

18. *Id.* at 107.

19. *Id.*

20. *Id.*

21. *Id.* at 107–08.

22. *Id.* at 108.

23. *Id.* at 109.

best sources, and acted upon it, neither impairs his rights as an inventor, nor detracts from his merits.²⁴

In short, Morse was the heroic winner of the telegraph derby, and entitled to its rich purse.

C. *A Cultural Theory of Innovation*

As the above examples of sunspots, telescopes, and telegraphs demonstrate, the phenomenon of simultaneous independent invention is not a recent artifact of our frenetic technological age, but rather as old as modern science itself. The Supreme Court itself took notice of the phenomenon in an important 1974 decision holding that federal patent law does not preempt state trade secret law.²⁵ The Supreme Court reasoned that technological progress will not be impeded by the “rare inventor with a patentable invention who chooses trade secret protection over patent protection.”²⁶ The Court cited social science research, which “predicts that if a particular individual had not made a particular discovery others would have, and in probably a relatively short period of time.”²⁷

One of the studies cited by the Supreme Court is a 1922 paper in *Political Science Quarterly*, in which Professors Ogburn and Thomas ask the question, “Are Inventions Inevitable?”²⁸ Ogburn and Thomas aggregated an ad hoc collection of 148 well-known simultaneous inventions or discoveries, from the above-mentioned sunspots, telescopes, and telegraphs, to the theory of natural selection (Darwin and Wallace, 1858) and the development of the photograph (Daguerre and Talbot, 1839).²⁹ The authors then theorized as to how much of invention is due to “mental ability” and how much to the “existing status of culture,” by which they meant the “material culture,” or what we might call the scientific and technological state of the art.³⁰

In their dated idiom, the authors conceded that “inventors are men of considerable mental ability.”³¹ But, they reasoned, within any large population and given the laws of normal distribution, such men are plentiful.³² On the other hand, Ogburn and Thomas argued, “the elements of the material culture at any one time have

24. *Id.* at 111.

25. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 474 (1974).

26. *Id.* at 490.

27. *Id.*

28. William Ogburn & Dorothy Thomas, *Are Inventions Inevitable? A Note on Social Evolution*, 37 *Political Science Quarterly* 83 (1922).

29. *Id.* at 93–98.

30. *Id.* at 89–93.

31. *Id.* at 86.

32. *Id.* at 86–87.

a good deal to do with determining the nature of the particular inventions that are made.”³³ The simultaneous independent invention by multiple persons of the electric railroad, Ogburn and Thomas contended, clearly had a lot to do with the availability of electric motors and rails.³⁴ Discussing various examples of independent simultaneous invention from their inventory of 148, the authors made the case for “the inevitability of an invention, once given the constituent parts.”³⁵

In a recent book entitled *Where Good Ideas Come From*, Internet entrepreneur Steven Johnson elaborates on this “cultural” theory of innovation.³⁶ Johnson compares the evolution of technology to the evolution of species, borrowing the evocative term from biologist Stuart Kauffman of the “adjacent possible.”³⁷ The gist of the theory is the observation that organic molecules floating about in the primordial soup at the origins of life could not suddenly self-organize into a sea urchin, but they could organize into a lipid bilayer, which could lay the groundwork for single-cellular life, and so forth.³⁸ Just as each incremental step in the evolution of life opened up an “adjacent possible” of organisms of increasing complexity, Johnson argues, so the history of technological evolution is the history of the “adjacent possible.”³⁹ The metaphor is used to describe the same phenomenon that had been observed by Ogburn and Thomas: electric engines and rails open the door to electric trams, and so on.⁴⁰

Johnson extends his metaphor to examine the conditions under which the evolution of ideas can progress most rapidly. For example, he observes that life likely evolved in the sea because a liquid provides just the right blend of fortuitous collisions of molecules and a stable medium in which to nurture them—a solid would be too stable and a gas too chaotic.⁴¹ Likewise, Johnson argues, “liquid networks” of people encourage the kinds of fortuitous collisions of ideas and existing (but previously unconnected) technologies that foster innovation.⁴² This is the reason, according to Johnson, that urban areas are such hotbeds of both cultural and technological innovation, that communication networks like the Internet have accelerated the pace of technological development, and that inno-

33. *Id.* at 87.

34. *Id.* at 89.

35. *Id.* at 90.

36. See Johnson, *supra* note 4, *passim*.

37. *Id.* at 30–31.

38. *Id.* at 31–33.

39. *Id.*

40. See Ogburn & Thomas, *supra* note 28, at 89.

41. Johnson, *supra* note 4, at 50–51.

42. *Id.* at 52–53.

vation on open and collaborative technical projects often outpaces that in walled-off corporate R&D departments.⁴³ One example Johnson discusses at length is Twitter, whose rapid innovation of new uses and capabilities, Johnson argues, is driven by its vast liquid network of users and its open application program interface (API).⁴⁴

Johnson, like Ogburn and Thomas before him, seems ready to give more credit for innovation to “the existing status of culture” than to the “mental ability” of particular heroic individuals. Johnson does give a few examples of lone-wolf innovators making creative leaps of apparently uncontested originality. One standout example is that of Willis Carrier, the inventor of air conditioning. In Johnson’s retelling, Carrier was an engineer at the Buffalo Forge Company, working on the problem of dehumidifying the air for an industrial printer that needed constant humidity to work properly.⁴⁵ Carrier built a contraption that pulled water chilled by an artesian well through a coil, cooling the air to the desired dew-point temperature. However, the coils were prone to rust. According to Johnson, Carrier discovered the solution in a breakthrough moment:

One night, waiting for a train in Philadelphia, watching a heavy fog roll across the platform, he had a sudden flash of insight. His air-conditioning system could be a miniature fog machine: by drawing air across a fine spray of water inside the device, he could use the water itself as a condensing surface. Thanks to those tenacious hydrogen bonds, the molecules of water vapor in the spray would pull the moisture out of the air, regulating the humidity and eliminating the rust problem.⁴⁶

In 1904, Carrier applied for a patent on an “Apparatus for Treating Air,” which was granted in 1906.⁴⁷ He and some other entrepreneurial engineers from the Buffalo Forge Company broke off to form the Carrier Engineering Corporation. Not only did Carrier become a wealthy man, he transformed the American landscape. Anyone who thinks that air conditioning does not rank with telegraphs and telescopes as a transformative invention has not visited the Sun Belt in the summer. As David Owen put it in his book *Green Metropolis*, “[i]n some parts of the country, cars function

43. *Id.* at 33 (cities), 46 (World Wide Web), 230–33 (decentralized innovation).

44. *Id.* at 192–94.

45. *Id.* at 214.

46. *Id.* at 215.

47. U.S. Patent No. 808,897 (filed Sept. 16, 1904).

partly as devices for transporting air-conditioning between buildings.”⁴⁸

The invention of air conditioning was, according to Johnson, the work of Willis Carrier and no apparent collaborators or contemporaries.⁴⁹ But, according to Johnson and his own ad hoc collection of “roughly two hundred of the most important innovations and scientific breakthroughs from the past six hundred years,” Carrier is very much the exception rather than the rule.⁵⁰ According to Johnson, the preponderance of progress, especially in the last two hundred years, has come from “collective, distributed processes, with a large number of groups working on the same problem.”⁵¹

D. Cultural and Heroic Models of Innovation in Patent Law

The “cultural” model of innovation, as opposed to the individual or what might be called the “heroic” model of innovation, raises a host of intriguing questions for patent law. Perhaps the most obvious is whether patents are needed at all. After all, if inventions are “inevitable,” as Ogburn and Thomas (and the Supreme Court) have suggested, why bother heaping rewards on the persons who happen to reach the finish line first? Or, taking a less extreme position and conceding that patents incentivize a bit of extra ferment along the boundaries of the adjacent possible, is a twenty-year monopoly too high a price to pay for what may be only a few months or years of a jump on what will be invented anyway? Is a winner-take-all system fair to the public, not to mention those who happen to cross the finish line just a few steps behind?

This is not a new critique of patent law. In his 1890 treatise, *The Law of Patents for Useful Inventions*, Yale law professor William Robinson set out the argument that the patent monopoly restricts the rights of independent simultaneous inventors.⁵² “With very few exceptions,” he wrote, “every invention is the result of the inventive genius of the age, working under the demand of its immediate wants, rather than the product of the individual mind.”⁵³ Professor Robinson, it would seem, was another proponent of the cultural theory of innovation, and also took the view that heroic inventors are few and far between: “The inventors who have stepped forward into the outer darkness, and inaugurated a new era in the industrial progress of mankind, are probably less in number than the cen-

48. David Owen, Green Metropolis 166 (2009).

49. Johnson, *supra* note 4, at 216.

50. *Id.* at 218.

51. *See id.* at 219, 228–29.

52. 1 William Callyhan Robinson, *The Law of Patents for Useful Inventions* 46 (1890).

53. *Id.*

tures of human history.”⁵⁴ Robinson also made the observation that often “the same discovery [is] simultaneously made by several inventors.”⁵⁵ He reasoned that “[m]en of the same genius, recognizing the same wants, skilled in the same arts, and familiar with the same defects in present methods of supply, might naturally be expected to arrive, at nearly the same time, at the same means of answering the public need.”⁵⁶ This, he noted, could lead to a seemingly unjust result, since the patentee appropriates “the whole discovery” and deprives simultaneous inventors of “the results they have themselves attained, and by rewarding him for his mere priority of publication or invention defeats the hopes and efforts of the rest.”⁵⁷

On the other hand, if Carrier had not invented the air conditioner, it is impossible to know how long it would have taken for someone else to come along and do the same. Carrier could be a poster boy for the patent system: an ingenious individual who has a breakthrough insight, gets his patent, starts a company, and changes the world. It is difficult to know how different Carrier’s story would have been without the protection that the law affords to inventors. Perhaps he would have started his company anyway, and kept far enough ahead of the competition to succeed without the benefit of a patent. Perhaps his invention would have been taken up by his employer and widely imitated while Carrier himself faded into obscurity. Or perhaps he would not have been motivated to invent anything at all.

It is the last possibility, of course, that provides much of the justification for the patent monopoly and its embrace of the heroic inventor. The patent system is widely understood as motivating and protecting investment in innovation. Even if an invention is “inevitable,” a few months’ or years’ acceleration is not trivial; in the case of a drug, for example, it can be the difference between life and death for many people.

Many people are equally disturbed by the second possibility that even if the social outcome were the same, an inventor like Carrier would be deprived of his due recognition or reward. There is an old and powerful assumption in the United States that inventors have a natural right (i.e., a right that transcends mere statute) to the fruits of their intellectual labors. The Commissioner of Patents, William Simonds, wrote in the very first edition of the *Yale Law Journal* in 1891 that “the intellectual production of an author or inventor, the visible expression of his mental conception, is his by

54. *Id.*

55. *Id.* at 47.

56. *Id.*

57. *Id.*

natural right.”⁵⁸ The assumption that inventors should be able to reap reward from their ideas has deep cultural and philosophical roots in the United States.

Whatever troubling questions may be raised by the cultural theory of innovation, the patent system is obviously going strong. A more practically relevant and in many ways more intriguing question is the challenge that simultaneous invention poses for determining when an invention is “obvious.” Current patent doctrine teaches that simultaneous invention can be an indication that an invention was obvious (an idea that did not seem to trouble the Supreme Court in *Morse*).⁵⁹ The next part of this Article takes a closer look at this doctrine, while the last part suggests some ways in which it could be refined.

III. THE LAW OF OBVIOUSNESS

The patent system is routinely criticized for issuing, and sometimes enforcing, patents on inventions that seem, at least on the surface, to be less than groundbreaking.⁶⁰ Perhaps in reaction, novelty and non-obviousness have been an active area of patent law. In 2007, the United States Supreme Court decided *KSR International Co. v. Teleflex Inc.*, an important opinion on patent obviousness that was widely interpreted as raising the bar for which inventions should be considered non-obvious.⁶¹ More recently, the Supreme Court upheld the controversial requirement that an invalidity defense (including, of course, obviousness) be proven by clear and convincing evidence, even in cases where the prior art asserted was never before the Patent and Trademark Office.⁶² In his concurrence, however, Justice Breyer encouraged trial courts to take more control over obviousness determinations with special interrogatories which separate out questions of fact that must be proven by clear and convincing evidence (e.g., the content or date of the prior art) from the determination of whether those facts demonstrate

58. Hon. Wm. E. Simonds, *Natural Right of Property in Intellectual Production*, 1 Yale L.J. 16, 17 (1891) (internal quotation marks omitted).

59. See *Geo M. Martin Co. v. Alliance Mach. Sys. Int'l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010) (citing *Concrete Appliances Co. v. Gomery*, 269 U.S. 177, 184 (1925)).

60. See, e.g., David Streitfeld, *Note: This Headline Is Patented*, L.A. Times, Feb. 7, 2003, <http://articles.latimes.com/2003/feb/07/business/fi-patent7> (criticizing a much-maligned patent on crustless peanut butter and jelly sandwiches). The patent was ultimately held invalid. See *In re Kretchman*, 125 F. App'x. 1012, 1012 (Fed. Cir. 2005) (per curiam order affirming invalidation of patent).

61. 550 U.S. 398, 419 (2007). For commentary on the impacts of *KSR*, see, e.g., Judy Namaat, *Computing the Effect of KSR*, 90 J. Pat. & Trademark Off. Soc'y 516, 530 (2008) (“Provided that *KSR* will lead to consistency, it absolutely does raise the bar for nonobviousness and innovation.”).

62. *Microsoft Corp. v. i4i Ltd.*, 131 S. Ct. 2238, 2252 (2011).

obviousness, a question of law.⁶³ The latter question is often the more difficult and contentious one; if trial courts follow this guidance, it could significantly change the way obviousness is litigated.⁶⁴

The following discussion gives an overview of the law of obviousness, followed by a more detailed look at cases discussing simultaneous invention as an indicator of obviousness.

A. *The Obviousness Statute*

The patent statute states that a patent may not be obtained where “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”⁶⁵ This is a bit wordy, but it does not do very much to explain how to determine what “would have been obvious.” Essentially, the statute says that the telescope should have been considered obvious if a person of ordinary skill in the art of optics in 1608 would have found it to be obvious.

Should it matter if the invention was made by children? By a common spectacle-maker, who was called an “illiterate mechanick” by a prominent contemporary astronomer?⁶⁶ By a number of different people at approximately the same time? Should it matter that the invention was made shortly after lenses of the appropriate power became available (albeit for purposes unrelated to making telescopes)? The patent statute largely leaves judges, and to some extent juries, to fill in the answers to those questions.⁶⁷

63. *Id.* at 2253 (Breyer, J., concurring). The concurrence also suggests that in addition to obviousness, novelty is also a question of law. *See id.* The Federal Circuit has nonetheless continued to treat anticipation as a question of fact. *E.g., In re NTP, Inc.*, 654 F.3d 1279, 1297 (Fed. Cir. 2011) (“Anticipation is a question of fact as is the question of what a reference teaches.” (citations omitted)).

64. The Federal Circuit, in the mean time, has continued to uphold verdicts in which the entire question of obviousness is given in the first instance to the jury. *See, e.g., Spectralytics v. Cordis Corp.*, 649 F.3d 1336, 1342 (Fed. Cir. 2011) (upholding a district court’s denial of a motion for judgment as a matter of law where substantial evidence supported a jury verdict of obviousness).

65. 35 U.S.C. § 103(a) (2006). Separately, the statute does not allow a patent if precisely the same invention is already in the prior art; this is referred to as “anticipation.” *See* 35 U.S.C. § 102(a) (2006). After the America Invents Act is fully implemented, the priority date will no longer be keyed to “the time the invention was made,” but rather, the filing date, or in some cases, the inventor’s date of first disclosure.

66. King, *supra* note 5.

67. Obviousness is a question of law for the court, while the factual underpinnings of a determination of obviousness, such as the scope and content of the prior art, differences between the prior art and the claims at issue, and the level of ordinary skill in the art at the time of invention, are jury issues. *Rothman v. Tar-*

The one additional clue the statute provides is that “[p]atentability shall not be negated by the manner in which the invention was made.”⁶⁸ The legislative history, echoed by the Federal Circuit, explains that it is immaterial whether the invention “resulted from long toil and experimentation or from a flash of genius.”⁶⁹ Accidents and mistakes, notoriously common in the history of innovation,⁷⁰ presumably also provide a path to the patent monopoly. This statutory provision appears to have important implications for the doctrine of simultaneous invention, a topic that is revisited in the final part of this Article.

B. *KSR v. Teleflex*

The leading case authority on obviousness is the Supreme Court’s decision in *KSR International Co. v. Teleflex Inc.*⁷¹ In that case, the Supreme Court warned that “[g]ranted patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.”⁷² So how does one tease apart “real innovation” from “advances that would occur in the ordinary course”?

The Supreme Court started by rejecting the Federal Circuit’s “teaching, suggestion, or motivation” (“TSM”) test as the sole methodology for evaluating obviousness. This test took (for better or worse) a somewhat mechanical approach to determining obviousness. Under the old test, courts were to determine whether all of the requisite pieces of the claimed invention were in the prior art, e.g., a weak convex lens, a strong convex lens, and perhaps a tube to fit them in.⁷³ But this, by itself, could never be sufficient to prove that the combination was obvious. Instead, the party challenging

get Corp., 556 F.3d 1310, 1317 (Fed. Cir. 2009). As a practical matter, juries routinely provide findings on the ultimate issue of obviousness, which are then re-litigated in post-trial motions. *See, e.g., id.* (upholding a district court’s denial of a motion for judgment as a matter of law where substantial evidence supported a jury verdict of obviousness).

68. 35 U.S.C. § 103(a).

69. *CFMT, Inc. v. YieldUp Int’l Corp.*, 349 F.3d 1333, 1340 (Fed. Cir. 2003) (quoting 35 U.S.C. § 103 Revision Notes and Legislative Reports, 1952 Notes).

70. Johnson devotes a whole chapter to “error,” chronicling inventions from penicillin to the daguerreotype to the vacuum tube that were the result of accident or mistake. Johnson, *supra* note 4, at 129.

71. 550 U.S. 398 (2007).

72. *Id.* at 419.

73. As it happens, the idea of looking through a tube *without* lenses goes back at least to Aristotle, who wrote, “The man who shades his eye with his hand or looks through a tube will not distinguish any more or any less the differences in colours, but he will see further; at any rate, people in pits and wells sometimes see the stars.” Aristotle, *Generation of Animals* (A.L. Peck trans. 1943).

the patent also had to find some “teaching, suggestion, or motivation” in the prior art that would have spurred a skilled artisan to fit the pieces together—say, a monograph postulating that if someone could just find the right combination of lenses, a useful magnification effect might be achieved. Proponents of the TSM test argued that it served as a safeguard for “hindsight bias,” the tendency of people to view combinations as obvious in retrospect.⁷⁴

The Supreme Court held strict adherence to the TSM test to be unduly “rigid.”⁷⁵ The Court confirmed that a patent is “not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art,” and also conceded that it “can be important” to look at motivations to combine those elements.⁷⁶ But it warned against an unduly mechanical approach, admonishing judges repeatedly not to underestimate the power of “common sense.” For example:

Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . .

. . . When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.⁷⁷

In a turn of phrase beloved by accused infringers seeking to invalidate patents, the Court held that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.”⁷⁸

The Court in *KSR* also reaffirmed the flexible, multi-pronged inquiry it had previously set forth in 1966 in *Graham v. John Deere Co. of Kansas City*.⁷⁹ *Graham* held that in addition to the content of the prior art and the level of ordinary skill in that art, “[s]uch sec-

74. Hindsight bias is a legitimate concern. Empirical data demonstrates that “once outcome information is known, people are cognitively incapable of preventing that information from influencing their understanding of past events.” Gregory Mandel, *Patently Non-Obvious II: Experimental Study on the Hindsight Issue Before the Supreme Court in KSR v. Teleflex*, 9 *Yale J. L. & Tech.* 1, 3 (2007).

75. *KSR*, 550 U.S. at 415.

76. *Id.* at 418.

77. *Id.* at 420–21.

78. *Id.* at 421.

79. *Id.* at 406.

ondary 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.”⁸⁰

KSR has been widely discussed in the patent literature, and has come in for its share of criticism. One critique is that, while urging a flexible approach centered on “common sense,” it actually does little in the way of providing a “clearly articulated test,” and “may have caused more harm than good by altering the obviousness inquiry without creating a safeguard against hindsight bias.”⁸¹ It has also been noted that the TSM test may have been reframed but is certainly not dead at the Federal Circuit.⁸²

In *KSR*, the Supreme Court seems to acknowledge the existence of both the cultural and the heroic models of innovation, but arguably favors the heroic. Patents are not intended for “advances that would occur in the ordinary course,” but rather for something more—“real innovation.”⁸³ For example, in pointing out that a person of ordinary skill is a person of “ordinary creativity,”⁸⁴ the Supreme Court implicitly suggests that only *extraordinary* creativity ought to be rewarded with a patent monopoly. By contrast, when the inventor merely fits together existing technologies “like the pieces of a puzzle”⁸⁵ (rails and electric motors, in one example from Ogburn and Thomas), the alleged invention is more likely to be obvious.

The Supreme Court in *KSR* does not directly tackle the issue of simultaneous invention, but under the reasoning of *KSR*, which seeks to discard those “advances that would occur in the ordinary course,” simultaneous invention would seem to be a powerful indicator of obviousness. On the other hand, scholars of innovation, from Professor Robinson’s 1890 patent treatise through Ogburn and Thomas’s 1922 article to Steven Johnson’s recent study of innovation, suggest that advances that would occur in the “ordinary course” are the much more common species of progress, even arguably for inventions as important as telescopes and telegraphs. Should valid patents be correspondingly rare?

80. *Id.* (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). According to a long-standing Federal Circuit rule, secondary considerations must always be considered when present. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983).

81. Emer Louise Simic, *The TSM Test is Dead! Long Live the TSM Test! The Aftermath of KSR, What Was All the Fuss About?*, 37 AIPLA Q.J. 227, 230 (2009).

82. *Id.* at 255.

83. *KSR*, 550 U.S. at 419.

84. *Id.* at 421.

85. *Id.* at 420.

C. Obviousness and “Secondary Considerations”

The “secondary considerations” relating to obviousness found in *Graham* and extended in the lower courts provide additional insight into the Court’s effort to grapple with the problem of the “adjacent possible.” These secondary considerations are also of great practical importance for patent litigation because they “must be considered when present.”⁸⁶ Ideally, “secondary considerations” allow the introduction of evidence that serves as a common sense, real-world check on what is obvious and what is not.

In keeping with the flexible and open-ended approach set forth in *Graham* and *KSR*, not all “secondary considerations” come into play in every case. A good collection of “secondary considerations” can be found in the Federal Circuit Bar Association’s model jury instructions, reproduced here:

- (a) Whether the invention was commercially successful as a result of the merits of the claimed invention (rather than the result of design needs or market-pressure advertising or similar activities);
- (b) Whether the invention satisfied a long-felt need;
- (c) Whether others had tried and failed to make the invention;
- (d) Whether others invented the invention at roughly the same time;
- (e) Whether others copied the invention;
- (f) Whether there were changes or related technologies or market needs contemporaneous with the invention;
- (g) Whether the invention achieved unexpected results;
- (h) Whether others in the field praised the invention;
- (i) Whether persons having ordinary skill in the art of the invention expressed surprise or disbelief regarding the invention;
- (j) Whether others sought or obtained rights to the patent from the patent holder; and
- (k) Whether the inventor proceeded contrary to accepted wisdom in the field.⁸⁷

86. *Geo M. Martin Co. v. Alliance Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1304 (Fed.Cir. 2010) (citing *Sud-Chemie, Inc. v. Multisorb Techs., Inc.*, 554 F.3d 1001, 1008 (Fed. Cir. 2009)).

87. Model Patent Jury Instructions § B.4.3 (Fed. Cir. Bar Ass’n 2009), available at <http://www.fedcirbar.org/olc/pub/LVFC/cpages/homepage/home->

Obviously, one of the “secondary considerations” in this repertoire most germane to the current discussion is (d), simultaneous independent invention. This factor is discussed in detail in the section below. Before moving on, however, it is worth noting that a handful of the “secondary considerations” are in some sense a mirror image of the “simultaneous independent invention” prong. For example, while simultaneous invention is evidence of obviousness, copying is evidence of the opposite. Copying might be considered an indication of non-obviousness because it suggests that it was easier to copy the idea than to develop it independently. The “long-felt need” and the “tried and failed” prongs similarly support the idea that the patentee did not merely happen to be the first to pluck the low-hanging fruit of the adjacent possible, but rather was able to reach higher and farther where others had failed.

D. Case Law Regarding Simultaneous Independent Invention

Simultaneous independent invention is not mentioned in *Graham*, but has a Supreme Court pedigree nonetheless. The doctrine can trace its history at least to a 1925 Supreme Court case involving a tower apparatus developed by one Lee Callahan for moving wet concrete around a construction site.⁸⁸ A figure from Callahan’s patent is reproduced here as Figure 1.

page.jsp.

88. *Concrete Appliances Co. v. Gomery*, 269 U.S. 177, 178–179 (1925).

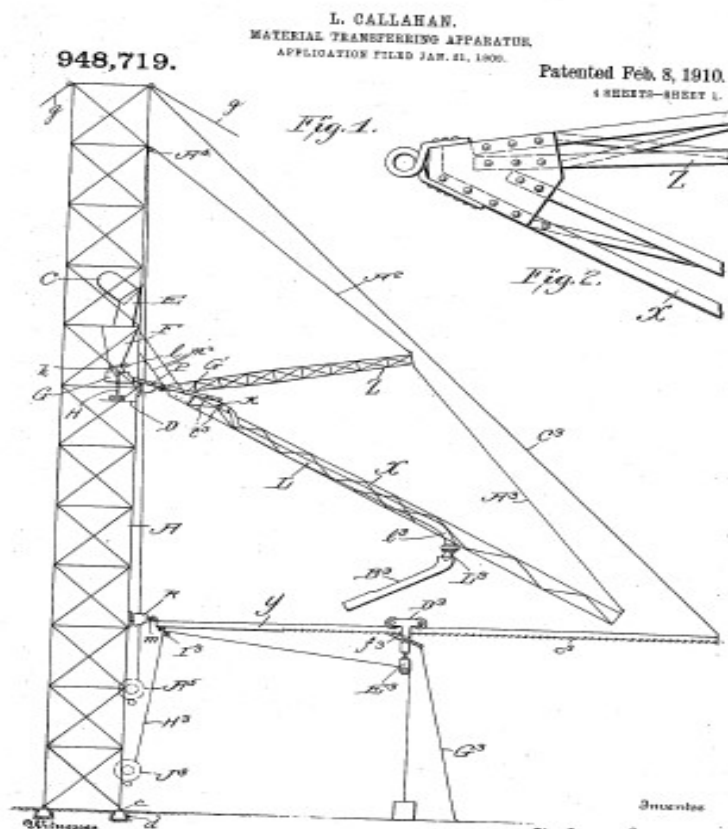


Figure 1: Callahan's "Material Transferring Apparatus" discussed in *Concrete Appliances Co. v. Gomery*

The Supreme Court recognized that the apparatus combined well-known elements of the "mechanical arts."⁸⁹ The Court queried "whether the combination is novel, and whether it passes the line, sometimes tenuous and difficult of ascertainment, which separates mechanical skill from invention."⁹⁰ To answer this question, the Court looked to the cultural context. Around 1905, for reasons that the Court mercifully leaves obscure, the construction industry saw a broad shift from dry to wet concrete.⁹¹ Contemporaneous with this development, numerous construction sites tackled the problem of how to move the wet concrete around. The Court catalogs a number of similar solutions that appeared around the country from San Francisco to St. Louis in the years 1906 to 1908, and notes that during this period Callahan and several others applied for patents that resulted in interferences.⁹² In view of this evidence, the Court

89. *Id.* at 180.

90. *Id.*

91. *Id.* at 182.

held that this “simultaneous” independent development over the course of several years was “persuasive evidence” of obviousness:

The adaptation independently made by engineers and builders of these familiar appliances to the movement and distribution of [wet concrete] in building operations and the independent patent applications, within a comparatively short space of time, for devices for that purpose are in themselves persuasive evidence that this use, in combination of well known mechanical elements was the product only of ordinary mechanical or engineering skill and not of inventive genius.⁹³

It is not altogether clear how to reconcile this case with *Morse*, in which the Court seemed untroubled by the evidence of multiple independent inventions. Perhaps the Court was influenced by the fact that, at the time of the invention of the telegraph, electromagnetism was relatively new, whereas the problem of how to move heavy stuff around is as old as Archimedes. It would be difficult to come up with any objective measure, however, of the quantity of “inventive genius” required for Callahan’s contraption in comparison to Morse’s. Both were attacking a known problem brought about by a change in the boundaries of the adjacent possible (electromagnetism in the case of Morse, and wet concrete on construction sites in the case of Callahan), and both appear to have arrived at a convergent solution close in time to their peers.

In any event, the holding of *Concrete Appliances* that simultaneous invention can indicate obviousness is alive and well under the “secondary considerations” rubric. Most recently, the Federal Circuit applied the doctrine in *Geo M. Martin Co. v. Alliance Machine Systems*.⁹⁴ As in *Concrete Appliances*, the case involved a rather unglamorous invention, a “bundle breaker” used to separate stacked sheets of corrugated board.⁹⁵ The claimed invention covered an improved bundle breaker that could be used simultaneously on multiple stacks of different heights.⁹⁶

The patent owner in *Geo M. Martin* presented evidence that the inventors conceived of their invention in 1999, reduced it to practice in 2001, and offered it for sale in early 2002.⁹⁷ When the inven-

92. *Id.* at 182–84. An interference is an administrative proceeding within the Patent and Trademark Office designed to determine priority of inventorship of co-pending applications.

93. *Id.* at 185 (citing *Atlantic Works v. Brady*, 107 U.S. 192 (1883)).

94. 618 F.3d 1294, 1305 (Fed. Cir. 2010) (citing *Concrete Appliances*, 269 U.S. at 184).

95. *Id.* at 1296.

96. *Id.*

97. *Id.* at 1302.

tors applied for their patent in August 2002, they disclosed to the patent office the prior art “Pallmac machine,” which could handle multiple stacks but had trouble with stacks of different heights.⁹⁸ Also at issue in the case was the prior art “Visy machine,” which went on sale as early as 1996 but which the patentee claimed was lacking key elements and in any event didn’t work.⁹⁹ Most intriguingly, the accused infringers introduced evidence of the “Tecasa machine,” which only became known in the United States in June 2002, and therefore, under the first-to-invent rules governing priority, was *not prior art*.¹⁰⁰

The patentee protested that the Tecasa machine was irrelevant because it post-dated the invention, but the Federal Circuit disagreed. The court held that this argument “would have more force if the Tecasa machine provided the only evidence of simultaneous invention,” but the Pallmac and Visy machines showed that the Tecasa machine was invented within a “comparatively short space of time.”¹⁰¹ Thus, the Federal Circuit upheld the use of the Tecasa machine as a “simultaneous invention” probative of obviousness.¹⁰² The three machines developed comparatively close in time to the alleged invention were considered by the court to be key components of the “strong evidence of obviousness” that led to the invalidation of the patent.¹⁰³

Geo M. Martin appears to provide a powerful incentive to use evidence of simultaneous independent invention as evidence of obviousness. In the handful of other cases where the issue has come up, however, the Federal Circuit has been more circumspect. For example, in *Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, the court cautioned, “[b]ecause the statute, 35 U.S.C. § 135, (establishing and governing interference practice) recognizes the possibility of near simultaneous invention by two or more equally talented inventors working independently, that occurrence may or may not be an indication of obviousness when considered in light of all the circumstances.”¹⁰⁴ *Lindemann* did not elucidate the types of circumstances under which simultaneous independent invention might support obviousness. Instead, the court in *Lindemann* simply held that an independent invention that came five years after the patent was “simply too late to have been relevant.”¹⁰⁵

98. *Id.* at 1297.

99. *Id.* at 1301.

100. *Id.* at 1305.

101. *Id.* (quoting *Concrete Appliances*, 269 U.S. at 184) (internal quotation marks omitted).

102. *Id.* at 1305–06.

103. *Id.*

104. 730 F.2d 1452, 1460 (Fed. Cir. 1984).

105. *Id.*

A third case, *Studiengesellschaft Kohle, m.b.H. v. Dart Industries, Inc.*, also touches upon simultaneous independent invention, but likewise leaves many questions unanswered.¹⁰⁶ That case involved catalysts used in the polymerization of ethylene.¹⁰⁷ Reviewing evidence of obviousness propounded by the accused infringer, the Federal Circuit acknowledged the “alleged nearly simultaneous invention by others at DuPont, including a Dr. Anderson.”¹⁰⁸ On the other hand, the court determined that the “evidence clearly shows that the cause of the catalysts in [a prior art process] was a mystery to [the inventor’s] contemporaries who were skilled in the art.”¹⁰⁹ The trial court had apparently discounted the evidentiary weight of the work of Anderson (the independent inventor) by concluding that he was “a man of more than ordinary skill.”¹¹⁰ The Federal Circuit did not endorse this finding regarding Anderson, but concluded nonetheless that the “evidence of nearly simultaneous solution by others is simply not persuasive under the circumstances.”¹¹¹ It is unclear in *Studiengesellschaft* what those circumstances are. One possible inference is that if the solution to a problem is a “mystery” to some of the inventor’s contemporaries, simultaneous independent invention is less important.

Another case, *Environmental Designs, Ltd. v. Union Oil Co. of California*, seems to dismiss simultaneous independent invention altogether.¹¹² Once again, the Federal Circuit acknowledges the evidence of independent conceptions proffered by the accused infringer—in this case, three alleged independent simultaneous inventions.¹¹³ The court all but dismisses this evidence, holding, “[w]e need not discuss those conceptions here, for we agree with [the trial court] that the evidence concerning them is of insufficient probative force to establish obviousness.”¹¹⁴ The court then adds, in a footnote, “[t]he virtually simultaneous making of the same invention does not in itself preclude patentability of that invention. Hence, the entirety of what is known as interference practice.”¹¹⁵

106. 726 F.2d 724 (Fed. Cir. 1984).

107. *Id.* at 726.

108. *Id.* at 727.

109. *Id.*

110. *Id.*

111. *Id.*

112. 713 F.2d 693, 698 (Fed. Cir. 1983).

113. *Id.*

114. *Id.*

115. *Id.* at n.7 (citing 35 U.S.C. § 135). Of course, none of the “secondary considerations” have ever been understood to “preclude patentability,” but the footnote does appear to suggest a reluctance to even consider this type of evidence as a relevant factor.

Federal Circuit cases elaborating on the simultaneous invention doctrine are surprisingly few and far between, though the recent decision in *Geo M. Martin* may spark renewed interest among patent practitioners. Nonetheless, in a surprising way, this relatively obscure doctrine cuts to some of the central problems of patent law. All innovation works along the boundaries of the adjacent possible, combining and extending old ideas into new ones. Can the patent law separate those who expand the boundary through “inventive genius” from those who simply produce “inevitable” combinations? Should it? Are inventions that appear to come out of left field (air conditioning and penicillin) more deserving of patents than those resulting from a race to the finish line (telegraphs and wet-concrete conveyors)?

IV. A REFINED APPROACH TO SIMULTANEOUS INVENTION AND OBVIOUSNESS

The circumstances under which simultaneous independent invention should be given significant weight have clearly not been fully fleshed out by the Federal Circuit. As noted in *Environmental Designs* and elsewhere, the doctrine is in tension with the elaborate set of rules and administrative proceedings for determining priority among competing claims of inventorship.¹¹⁶ Why go to all that trouble to determine the winner of the race when the fact that there were multiple finishers suggests that the solution was obvious? Furthermore, if the Supreme Court was correct in *Kewanee Oil* that nearly all inventions will be the subject of simultaneous independent invention, then surely the doctrine would prove too much, since nearly all patents would then have to be deemed obvious.

One sensible way to contextualize simultaneous invention when analyzing obviousness may be to ask two further questions: (1) how well-known was the problem that the inventors were trying to solve, and (2) how much time or effort was required between the identification of the problem and the identification of the solution?

If a problem is well known, a number of parties quickly coming up with similar solutions seems to be powerful evidence of obviousness. This appears to have been the Supreme Court’s reasoning in *Concrete Appliances* when it held that “independent patent applications, within a comparatively short space of time,” shortly after the need for a solution arose, suggested that the wet-concrete mover was “the product only of ordinary mechanical or engineering skill

116. Note however that this tension did not seem to trouble the Supreme Court, which appeared to use an interference proceeding as evidence of obviousness. See *Concrete Appliances Co. v. Gomery*, 269 U.S. 177, 184 (1925).

and not of inventive genius.”¹¹⁷ On the other hand, when a problem is well known and multiple parties put considerable time, effort, and skill into finding a solution, then perhaps the existence of multiple finishers should not be held against the patent applicant. While it may be true that a solution was “inevitable” at *some* point, the patent race may well have had the effect of motivating all participants and bringing about a faster solution. This may be the reason that concerns about obviousness did not trouble the Supreme Court in *Morse*: “scientific men in different parts of Europe were earnestly engaged in the same pursuit,” and to the victor went the spoils.¹¹⁸

Happily, to implement this refinement, it will not be necessary to add an extra factual dimension to the obviousness analysis. The questions of when the problem was identified and how long it took to solve it are already built into the *Graham* factors in the guise of “long felt but unsolved need” and “failure of others.”¹¹⁹ Examining simultaneous independent invention in the context of these other factors can add to the obviousness analysis without necessarily wiping out the vast majority of patents.

Embracing patent races in certain circumstances, and accepting that inventions may be non-obvious even if they are inevitable, is consistent with Congress’s intent that it be immaterial whether the invention “resulted from long toil and experimentation or from a flash of genius.”¹²⁰ In the category of inventions that result from “long toil and experimentation,” it is to be expected that there will often be multiple laboratories or commercial competitors converging on a single solution. Innovation that does not fall within the heroic model of invention may well form the bulk of our technological progress.

For example, modern techniques of drug development depend as much on computerized trial and error as on human ingenuity. High throughput screening technology allows large numbers of chemicals to be tested for their impact on biological activity, while combinatorial chemistry technologies allow the synthesis of large numbers of compounds for testing.¹²¹ Yet few would argue that the pharmaceutical industry’s large investment in scaling up its ability to identify promising compounds through trial and error should

117. *Id.* at 185 (citing *Atlantic Works v. Brady*, 107 U.S. 192 (1883)).

118. *O’Reilly v. Morse*, 56 U.S. 62, 106 (1853).

119. *Graham*, 383 U.S. at 17.

120. *CFMT, Inc. v. YieldUp Int’l Corp.*, 349 F.3d 1333, 1340 (Fed. Cir. 2003) (quoting 35 U.S.C. § 103 Revision Notes and Legislative Reports, 1952 Notes).

121. *See, e.g.*, Oliver Gassman et. al., *Leading Pharmaceutical Innovation* 38–39 (2d. ed. 2008) (describing high throughput screening and combinatorial chemistry technologies).

negate its ability to obtain patent protection for the results. To the contrary, patent protection is a key enabler of those investments.

At the same time, the heroic inventor should get his or her due. The defining characteristic of a heroic inventor, someone who seems to leap over the boundary of the adjacent possible, is not only the ability to find the solution, but also to define the problem in the first place. There was no race, for example, to invent the World Wide Web. Tim Berners-Lee, commonly credited as the inventor of the World Wide Web, was not part of a team of scientists looking for ways to develop a global information platform.¹²² To the contrary, the invention was a pet project he worked on in his spare time.¹²³ Coming up with the question—“how can I link documents located on different computers”—was every bit as important and innovative as the ultimate technical solution. Similarly, the genius of Carrier’s flash of insight on the train platform was not only his solution for cooling air, but recognizing the problem in the first place. In these cases, the absence of a “long felt but unsolved need” or the “failure of others” is no evidence of obviousness at all. As former Defense Secretary Donald Rumsfeld famously put it, there are known unknowns, and then there are unknown unknowns.¹²⁴ Identifying which type of unknown is in play should also shape the obviousness analysis.

The telescope was indisputably one of the breakthrough inventions of the seventeenth century. If there had only been one inventor of the telescope, it is unlikely that the novelty of the invention would have been contested. The results were certainly unexpected and wildly successful. But the multiple simultaneous inventions do seem to be powerful evidence that this particular expansion into the adjacent possible was the inevitable result of playing around with newly available lenses. An adherent to the cultural view of innovation might be inclined to believe that a patent for Lippershey would have been wasteful and arbitrary, while those who believe strongly in rewarding an inventive genius, even if there are other inventive geniuses hot on his or her heels, might support a generous reward for the “illiterate mechanick” from Holland.

At the end of the day, whether inventions are inevitable or not, *somebody* has to make them first. There is an old joke about two economists walking down the street. One sees a hundred dollar bill and bends to pick it up. The other tells him, “Don’t bother. If that hundred dollar bill were really there, someone would have picked it

122. Johnson, *supra* note 4, at 90–91.

123. *Id.*

124. Donald Rumsfeld, U.S. Sec’y of Def., Department of Defense News Briefing (Feb. 12, 2002) (transcript available at <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=2636>).

up already.” As the United States Patent and Trademark Office issues its eight millionth patent,¹²⁵ one thing is clear—plenty of people are more streetwise than the second economist.

125. See Press Release, U.S. Patent and Trademark Office, United States Patent & Trademark Office Issues 8 Millionth Patent (Aug. 16, 2011), *available at* http://www.uspto.gov/about/ipm/8_Millionth_Patent.jsp.