A TIMING APPROACH TO PATENTABILITY

by
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Patent law's "obviousness" doctrine, which bars patents for "obvious" innovations, is generally understood as trying to exclude from patentability those innovations that would have been created and disclosed even without the inducement of patent rights. An ideal test of obviousness would both serve that overarching policy goal and be sufficiently definite and clear that the doctrine could be applied with consistency. This Article demonstrates that a "timing approach" to patentability can achieve those twin objectives. The approach is based on the insight that the free and open competition to innovate present before patenting will reliably generate all obvious innovations quickly once the market and technological conditions make the innovation both valuable and obvious. Obvious innovations will thus arise soon after the technological or market conditions change to make the innovation more valuable or easier to achieve. Because changes in technology and market needs are relatively easy to observe, the timing of those changes can provide relatively clear and definite evidence of obviousness. This timing theory is remarkably good not only in explaining the results of the judicial decisions but also in predicting the existence of previously overlooked timing evidence. Most notably, a thorough review of the record in the seminal case of Hotchkiss v. Greenwood *strongly suggests that the innovation there was an obvious response to a very recent technological development. A timing approach therefore reveals an important unifying pattern in the case law and connects that pattern to a fundamental relationship between the patent system and competition to innovate.*

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I. INTRODUCTION

Two themes have dominated the law and scholarship concerning the standard for obtaining a patent. First, ever since *Graham v. John Deere Co.*, the core goal of the patentability standard has been to try to identify "those inventions which would not be disclosed or devised but for the inducement of a patent."[1] In other words, the patent system aims to confer exclusive rights only in those circumstances where the rights are needed to bring forth the invention. Where ordinary competition and the normal incentives of the marketplace, including the rewards of being the first mover in the field, are sufficient to generate an invention, the patenting system should not impose upon society the burdens of government-conferred exclusive rights. The statutory standard for achieving this goal is the requirement that patented inventions not be "obvious . . . to a person having ordinary skill in the art."[2] Although as will be discussed below, the nonobviousness requirement is not precisely identical to a principle allowing patents only for inventions that need the patent incentive, we will assume for the moment that it is a fair approximation.

The second theme evident in both judicial opinions and scholarly articles is that the legal institutions of the patent system should try to find and articulate as clear a standard as possible for deciding patentability. The concern here is that neither the generalized goal of the patent system—to reward only those inventions that need the inducement of a patent—nor the unadorned nonobviousness standard as set forth in the statute is sufficiently definite for real-world judges and patent examiners to apply with any degree of consistency and clarity across the multitudinous contexts in which patentability must be evaluated. This second theme aspires to limit the discretion of decision-makers and to make their decisions as accurate as possible rather than mere wild ex post guesstimates of obviousness that vary dramatically from decision-maker to decision-maker. The thesis of this Article is that a "timing approach" to judging obviousness can achieve these two objectives. The approach is based on the insight that the free and open competition to innovate present before patenting—what is often referred to as "patent racing" but might more generally described as "innovation racing"[3]—will reliably

[1] 383 U.S. 1, 11 (1966).

[2] 35 U.S.C. § 103(a) (2000).

[3] The term "innovation racing" is more general because the incentives to be first—to win the race—include both patent and non-patent incentives. Thus, for

generate all obvious innovations quickly once the market and technological conditions make the innovation both valuable and obvious.

Patent or innovation racing is an overarching and extraordinarily important feature of the patent system, for the patent system attempts not merely to limit competition after the grant of exclusive rights but also to foster competition prior to patenting. Sometimes the competition to obtain a patent is evident, as when several groups strive to achieve a well-defined goal. Other times it is less noticeable, as when one individual or firm pursues a lonely and risky path in attempting to develop a technology that others have ignored. Whether evident or not, the race to innovation remains open at least until one firm wins the race.

In all cases in which our legal institutions determine whether any particular innovation should be patentable, the presence of an open competition to innovate provides strong evidence that, in the years just prior to the innovation, all of the incentives to innovate provided by marketplace competition were insufficient to generate the innovation. Indeed, the evidence is even more powerful than that because, in the years preceding the innovation, other potential innovators had both the certainty of non-patent incentives to innovate plus at least the possibility of obtaining a patent. If the innovation is a valuable one (which is to say, in nearly all the cases that we need to care about), the inability of the marketplace to achieve the innovation at any earlier time provides powerful, objective evidence that the innovation was not obvious to other people working in the field of endeavor.

It is powerful evidence, but not conclusive evidence, because the omnipresent competition to innovate operates continuously through time periods that may have had much different market conditions. To see the weakness of the evidence produced by competition, let us imagine what might be nearly perfect evidence of nonobviousness. Assume that we could run a controlled experiment in which numerous skilled potential innovators, each of which has similar incentives to innovate, are given the task of creating something new and valuable in their industry. If one succeeds and all others fail, that would be seemingly rigorous evidence that the innovation was not obvious, at least in a conventional sense.

In *every* case in which an innovator can prove mere *novelty*, the ubiquity of competition prior to patenting[4] gives us precisely this sort of

example, even where an innovation is truly obvious and therefore unpatentable, potential innovators still race to create the innovation because, if they are first on the market with the innovation, they may enjoy some slight "first mover" advantage over their competitors.

[4] Competition prior to patenting is ubiquitous even in the case of improvement patents on a pioneering technology covered under an existing patent. As I have noted elsewhere, patent law—unlike copyright law—does not grant the pioneer exclusive rights to make improvements on the previously conferred intellectual property. *See* John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 487–91 (2004). Because the pioneer patent holder can avoid the transaction

evidence with the exception of a timing problem: The innovator who first succeeded in achieving the novel innovation was working in the most recent time period. All of the other potential innovators who failed to achieve the innovation—including all those who failed even to investigate the possibility of an innovation—were by definition working in time periods earlier than the first innovator.[5] If we could be confident that the earlier time periods were substantially identical to the time when the innovator first achieved the relevant innovation, then we could be fairly confident that the invention is not obvious. Conversely, if the most recent time period is different in terms of the components available for making the innovation, or in the market need for the innovation, then the earlier time periods provide little relevant evidence of nonobviousness. Indeed, the timing evidence cuts the other way: If the innovation was created soon after the components of the innovation or the market need arose, then the swift arrival of the innovation provides some evidence, though hardly perfect evidence, that the innovation may have been a natural and obvious response to the new conditions.

In sum, the thesis of this Article is that considerations of timing should be everything—or just about everything—in applying the obviousness standard, and therefore in judging patentability. The most important question to ask in obviousness analysis is thus: "If the innovation were obvious, why was it not created before?" That question may sound favorable to the applicant seeking to obtain a patent or to the patentee seeking to defend an issued patent, but it is in fact merely a neutral way to focus on the right issue. An obvious innovation may not have been previously created because a recent change has yielded a new component necessary for the innovation (a supply-side change) or a new market demand (a demand-side change). Where no such change explains the emergence of the innovation—i.e., where supply and demand considerations have remained relatively static for some significant period of time—then the innovation was almost certainly nonobvious.

The remainder of this Article explores the validity and implications of this thesis. Part II considers the extent to which the thesis explains the existing case law. The agreement between the thesis and existing case law should encourage courts to recognize that a timing approach is within the parameters of precedent and to rely more explicitly on timing considerations. Part III explores those situations in which timing

costs associated with licensing the improvement patent if the pioneer obtains the improvement patent first, the pioneer patent holder will have slightly greater incentives to win the race for the improvement patent. The difference in incentives may not be great, and in many actual cases, pioneers have lost out to subsequent improvers. Thus, even in the case of improvements on a pioneering patent, competition to patent is ubiquitous and robust. Improvement patents are subject to some special considerations, as discussed *infra*, Part III.B.

[5] I say "by definition" here because the first innovator is defined to be the person who achieved the innovation prior to all others. All failures lie in the past.

considerations may not be good predictors of obviousness and examines other caveats on the basic thesis. Part IV shows how a timing approach can be implemented with existing doctrinal framework. Part V offers some conclusions.

II. TIMING CONSIDERATIONS AND THE CASE LAW

If timing is the key to understanding obviousness, then the vast bulk of decided cases should follow the predictions of timing-based approach. We should expect this heavy congruence *not* because the courts and the patent office have stressed timing considerations to the degree suggested in this Article. The courts and the patent office have followed other metrics in trying to identify cases of obviousness, but if those methods are at least reasonably effective in identifying true cases of obviousness, then an approach focused on timing should yield the same conclusion in most cases. In those cases where a timing approach suggests a different result than that reached in the case law, we would expect those cases to be greatly controversial. In fact, this is what we observe.

A. Recent Supply-Side Change

Where a valuable innovation requires merely an obvious combination or modification of one or more relatively new components, the prior unavailability of the components provides a good explanation for why the innovation had not previously been created. An excellent example of such a "supply-side" change leading to a valuable and yet obvious innovation is the infamous patent on the internal combustion automobile granted to George B. Selden.[6]

Selden was a patent attorney and an amateur tinkerer who worked at about the time that internal combustion engines were just being perfected.[7] Selden sought and obtained a very broad patent on the combination of an internal combustion engine with the other normal components of an automobile (including the chassis, running gears, the steering mechanism, etc.).[8] Because so many other individuals were then experimenting with the use of internal combustion engines for automobiles, it is very difficult to tell whether Selden should be considered the first. But even assuming that he was the first (or, if not, that the party who was truly first had also applied for a patent), then the patent system must decide whether it was obvious to build an automobile with an internal combustion engine. While pure intuition would seem to suggest that the idea is obvious—why wouldn't an engine with an output

[6] *See* U.S. Patent No. 549,160 (issued Nov. 5, 1895).

[7] For Selden's background and further discussion of his infamous patent, see WILLIAM GREENLEAF, MONOPOLY ON WHEELS: HENRY FORD AND THE SELDEN AUTOMOBILE PATENT (1961).

[8] *See* U.S. Patent No. 549,160, at 3 (setting forth claim 1 of the patent).

given in horsepower be a good substitute for a horse?—considerations of timing provide an even more convincing case that the idea was obvious. The historical record provides numerous examples in which other individuals, when presented with the new technology of internal combustion engines, immediately combined the new engine with other components to construct a rudimentary automobile.

In the Selden litigation, the courts ultimately reached the conclusion that the apparently broad reach of Selden's patent claims could not be sustained because the basic concept was obvious—or rather, in the legal language of the time, it lacked "invention."[9] But the courts were able to reach that result only after years of litigation and conflicting judicial decisions. A focus on timing considerations could have yielded the same results in a much more clear and theoretically rigorous fashion.

Timing considerations also explain the obviousness of the patent at issue in *Graham v. John Deere Co.*[10] The patent at issue, U.S. Pat. No. 2,627,798 (1953), covered a new clamp for holding a plow shank; the inventor, William Graham, filed for the patent in August of 1951. The crucial pieces of prior art that rendered Graham's new clamp obvious—Graham's own earlier clamp and a clamp developed by the Glencoe Manufacturing Corporation—were very recent developments. Graham's own prior clamp was invented in 1947 and was not marketed until the late 1940's at the earliest.[11] When Graham began marketing that clamp, it quickly became clear that the clamp had some minor design flaws that produced both an excessive degree of wear on certain parts and unnecessarily high repair costs. Those wear-and-repair problems required two minor modifications of the newly marketed clamp: A bolt had to be inserted to hold the shank more securely in the clamp, and the position of one part had to be changed to eliminate wear on another part that was more expensive to replace.[12] Even if the only prior art had been Graham's own earlier clamp, it is doubtful that the new clamp should have been viewed as anything more than an obvious response to the new problems that had just arisen with the marketing of the earlier clamp. But any doubt as to the obviousness of Graham's new clamp was dispelled by the development of the Glencoe clamp just three months prior to Graham's invention date for the '798 patent.[13] The Glencoe clamp

[9] *See Columbia Motor Car Co. v. C. A. Duerr & Co.*, 184 F. 893, 901 (2d Cir. 1911) (construing the claims narrowly because otherwise the patent would be "invalid for want of invention").

[10] 383 U.S. 1 (1966).

[11] *See* John F. Duffy & Robert P. Merges, *The Story of Graham v. John Deere Company: Patent Law's Evolving Standard of Creativity*, *in* INTELLECTUAL PROPERTY STORIES 109, 128 (Jane C. Ginsburg & Rochelle Cooper Dreyfuss eds., 2006).

[12] *Id.* at 128–29 (detailing these two changes).

[13] *Id.* at 138–39 (noting that Glencoe sold its clamp in May of 1951, while Graham did not file his patent application until August of 1951). Graham had to rely on his application filing date as his date of invention because he had not previously built (reduced to practice) his invention, and he does not seem to have been

achieved all the stated objectives of Graham's '798 patent in highly similar ways.

The nearly simultaneous development of the Glencoe clamp and the clamp covered in Graham '798 patent casts doubt on whether either should be viewed as anything more than an obvious response to new conditions. But it is absolutely clear that the second of the two developments (Graham's version) cannot be considered nonobvious in light of the first (the Glencoe clamp). In Graham's case, we have a particularly good answer to the question: "If it were so obvious, why was it not invented earlier?" The Glencoe Corporation did invent nearly the same thing three months earlier. With that very recent "supply-side" change in the prior art, the '798 clamp was obvious.

A timing approach also provides great insight into two other important Supreme Court cases on the patentability standard, *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*[14] and *Hotchkiss v. Greenwood.*[15] In *Anderson's-Black Rock*, the patent claimed the combination of a prior art radiant heat burner and a prior art bituminous paving machine.[16] Though the Supreme Court held that patent invalid under the Court's doctrine on "combination patents"—which holds patents invalid if the elements in combination do "no more than they would in separate, sequential operation"[17]—that rationale should not necessarily be persuasive under a timing approach. The courts should ask: "If the combination of the old elements were obvious and commercially valuable, why did the combination not occur earlier?"

The version of the facts set forth by Court of Appeals, which had sustained the patent by divided vote, seemed to suggest that the combination had not previously been achieved because the patentee, Charles Neville, had made a nonobvious discovery.[18] Neville's combination of a radiant heat burner and paving machine was designed to solve a problem long recognized in the art of paving a road with hot bituminous materials: Paving machines typically put down hot bituminous material in long parallel strips. The recognized difficulty was that, between the time when the paving machine puts down a first and second strip of material, the first strip of material cools to an extent that the "the hot material of the second strip will not bind with the cold material of the first strip, leaving what has long been known as a 'cold joint.'"[19] Various techniques had previously been tried to eliminate such

diligence in working on his clamp from a time before Glencoe's sales.

[14] 396 U.S. 57 (1969).

[15] 52 U.S. (11 How.) 248 (1851).

[16] 396 U.S. at 58

[17] KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1740 (2007) (describing the rationale of *Anderson's-Black Rock*).

[18] Pavement Salvage Co. v. Anderson's-Black Rock, Inc., 404 F.2d 450, 451–52 (4th Cir. 1968).

[19] *Id.* at 451.

"cold joints." Radiant heat burners in particular had been tried decades earlier but had been abandoned because, prior to Neville's work, they were thought to be inadequate to solve the problem in a commercially feasible way.[20] The majority of the Court of Appeals credited Neville with the insight of "turn[ing] away from current concepts [for solving the cold joint problem] and hark[ening] back to the discarded notion of preheating the old material [with a radiant heat burner]."[21] Neville's radiant heat generator "produce[d] highly penetrative radiant energy" that produced "complete" fusion between bituminous strips, and his innovation had "an obvious utility of practical and economic importance."[22] If that had been Neville's contribution to the art—if he had found some way of rescuing a previously discarded technique to solve a long known problem—then his case for obtaining a patent would seem strong.

Yet more careful inquiry into the facts of *Anderson's-Black Rock* reveals some fatal timing problems in Neville's case for a patent. First, and perhaps most importantly, more efficient radiant heat burners had been developed just before the time of Neville's claimed invention. Neville filed his patent application in February of 1959, and the radiant heat burner in his combination closely resembled one patented in 1956 by someone else.[23] Thus, as even the Court of Appeals majority noted, the relevant question in the case was whether Neville's combination was obvious "in light of the [relatively recent] availability of more efficient radiant energy generators."[24]

That timing problem in itself may not have been fatal to Neville's claim to a patent. The patent statute expressly provides that a patent may be obtained for a "new use of a known . . . machine,"[25] so if Neville but not others had seen that the relatively new radiant heat generators could be used to solve the cold joint problem, then perhaps Neville would have been entitled to a patent. Even a couple years of other firms and innovators failing to see an application for a new technology might very well be sufficient to establish that the application is not obvious.

Unfortunately for Neville, he did not claim—and it appears that he could not claim—the process of using the newly developed, more efficient radiant heat generators as a means for solving the cold joint problem. The district court had found as a matter of fact that, within

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[20] *Id.* (noting that attempts to use radiant heat burners to solve the cold joint problem dated back at least to 1905).

[21] *Id.*

[22] *Id.* at 451–52.

[23] *See* U.S. Patent No. 3,055,280 (filed Feb. 20, 1959) (issued Sept. 25, 1962); *see also Pavement Salvage Co.*, 404 F.2d at 452 (noting that Neville's burner was "not unlike that disclosed in Schwank Patent No. 2,775,294 (1956)"). The application for the Schwank patent was first filed in Germany in 1950.

[24] Pavement Salvage Co. v. Anderson's-Black Rock, Inc., 404 F.2d 450, 452 (4th Cir. 1968).

[25] 35 U.S.C. § 100(b) (2000).

Neville's combination, the radiant burner was performing "the same job that it formerly did when not in combination" and that therefore the legal question was whether, "assuming that the radiant heat would work effectively, [it was] obvious that a more successful machine would evolve if all of the elements were constructed on one chassis."[26] The first footnote in the Supreme Court's opinion also stressed the narrow scope of Neville's claimed invention and provides a good clue as to why the claim was so limited: During the period of 1954 and 1960, Neville was engaged in touting the advantages of new radiant heat burners as a solution to the cold-joint problem, and he even sold some radiant heat burners specifically for that purpose.[27] These facts suggest that, by the time Neville applied for a patent in 1959, knowledge concerning use of newer radiant heat burners had probably entered the public domain, possibly because of Neville's own disclosures and commercial activity more than one year prior to his patent application.[28] Neville's patent attempted to cover one obvious implication of this new "supply-side" information. Once the prior art supplies a new radiant heat burner capable of solving the cold joint problem, it is trivial to combine that new element with the other components of a paving machine, and the combination in fact happened quickly.

The seminal case of *Hotchkiss v. Greenwood*[29] also suggests a supply-side change. The alleged invention in *Hotchkiss* involved a particular design for doorknobs as applied to knobs made of clay or porcelain. The relevant design required the inside of the knob to contain a dovetailed cavity into which molten metal could be poured. The cavity was useful for joining the doorknob to the screw or shank that connects to a door's latching mechanism, and the design had previously been applied to knobs made of metal or wood.[30] The timing question in *Hotchkiss* is thus: "Why wasn't the dovetailed cavity design, which had been used in wood and metal doorknobs, applied sooner to porcelain or clay knobs?"

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[26] *Pavement Salvage Co.,* 404 F.2d at 455 (Craven, J., dissenting) (quoting the unpublished district court decision).

[27] 396 U.S. at 60–61 n.1.

[28] *See* 35 U.S.C. § 102(b) (2000) (barring the issuance of a patent on subject matter that was "in public use or on sale" more than one year prior to the filing date of the patent application). The Petitioner's Brief also argued that "if [Neville] had discovered anything, [he] was the first to use a Schwank type radiant energy generator in road building, which may well have been a new use for this particular type of radiant energy generator," but if that were the case, Neville "should have sought protection on a process for a new use of the improved device" rather than the combination that he did claim. Pet. Br. at 12–13. Neville prior disclosures and commercial work may explain why Neville avoided claiming a new use for the new radiant heat burners.

[29] 52 U.S. (11 How.) 248 (1851).

[30] *Id.* at 260 (recognizing that "knobs of metal, wood, &c., connected with a shank and spindle, in the mode and by the means used by the patentees in their manufacture, had been before known").

The answer to this question is clearly not that the porcelain or clay knobs were anything new in the art. The record from the case shows that the accused infringer was able to cite numerous instances in both England and the United States in which manufacturers had made clay or porcelain doorknobs "long before" Hotchkiss's alleged invention.[31] By contrast, the defendant cited only a single example in which the dovetail cavity design had been previously used for making knobs, and the defendants made no claim that the dovetail design was used "long before" Hotchkiss's alleged invention.[32] Furthermore, as alleged by the defendants, the dovetailed design was used in a city—Middletown, Connecticut—less than thirty miles from Hotchkiss's residence of New Haven.[33] The facts suggest that, while porcelain and clay knobs were long in use, some innovator in Middletown, Connecticut, had recently developed a better way to fasten doorknobs to metal shanks. All Hotchkiss did was to take that new technology and apply it to clay and porcelain knobs. Yet with the supply-side change—the availability of the dovetailed-cavity design—the application of that design to traditional knob materials such as clay and porcelain was something that could be accomplished by ordinary artisans.

B. Recent Demand-Side Change

Demand-side changes provide another good explanation for the emergence of valuable yet obvious innovations. The recent case of *KSR International Co. v. Teleflex Inc.*[34] is an excellent example. The invention at issue there was a new type of adjustable gas pedal for an automobile. Prior art adjustable gas pedals had been designed to interact with a mechanical throttle via a cable or other similar mechanical link. The claimed invention at issue in *KSR*, which was completed no later than February 14, 1998, covered one particular type of prior art adjustable gas pedal coupled with an electronic position sensor. The electronic position sensor was needed because, in the 1990s, car manufacturers were increasingly using electronic throttles to control an automobile's engine.

The timing question in *KSR*—if this valuable combination was obvious, why was it not created prior to the late 1990s?—is easily answered by examining the demand for such pedals. As the district court

[31] Transcript of Record at 6, Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1851) (No. 171) (defendant's answer to Hotchkiss's complaint alleging that clay or porcelain knobs had been made in New York, New Jersey, Pennsylvania, and several cities in England "long before" and "long prior to" Hotchkiss's alleged date of invention).

[32] *Id.* at 10 (noting that the defendants offered evidence that Hotchkiss's method had previously been "known and used . . . as a mode of fastening shanks . . . to metallic knobs").

[33] *Id.* (citing one use of the dovetail design from Middletown, Connecticut, which lies twenty-seven miles northeast of Hotchkiss's home city New Haven, Connecticut).

[34] 127 S. Ct. 1727 (2007).

found, it was "undisputed that in the mid-1990's more cars required the use of an electronic device, such as a pedal position sensor, to communicate driver inputs to an electronically managed engine."[35] That demand-side change created "a marketplace [with] a strong incentive to convert mechanical pedals to electronic pedals."[36] Because the "prior art taught a number of methods for achieving [the necessary update]" multiple engineers across the industry were independently able to achieve the new combination in response to the market need.[37] That is a classic situation in which granting exclusive patent rights is unnecessary.

Examples similar to *KSR* are common. For example, demand-side changes easily explain the emergence of Amazon.com's much maligned patent on the "1-Click®" method for ordering goods across a computer network.[38] Again, conceding that speedier methods of ordering goods on a computer network are valuable, we must ask why was such an obvious development—one-click of a computer mouse button rather than multiple clicks—delayed until the mid-1990s? The answer is quite clearly tied to the tremendous change in demand for internet ordering methods in the mid-1990s, which was itself spawned by the rapid increase in internet commerce during the same time period.

Demand-side changes may also come from regulatory events. For example, in *Richardson-Vicks Inc. v. Upjohn Co.*, [39] the court invalidated a patent on a cold medicine that was nothing more than the combination in a single pill of pseudoephedrine (a common prior art decongestant) with ibuprofen (a common prior art painkiller). The prior art included cold medications combining pseudoephedrine in a single pill with other common painkillers such as aspirin and acetaminophen, and there were also prior physician prescriptions directing patients to take separate doses of ibuprofen and pseudoephedrine. Why then was the single-pill pseudoephedrine/ibuprofen not invented until early 1984, when the plaintiff's patent application was filed? There was a clear answer: In August of 1983, the FDA advisory panel recommended that ibuprofen should be approved for nonprescription (over-the-counter) sales.[40] Numerous publications predicted that the agency would follow that

[35] Teleflex Inc. v. KSR Int'l Co., 298 F. Supp. 2d 581, 593 (E.D. Mich. 2003).

[36] *KSR*, 127 S. Ct. at 1733.

[37] *Id.* at 1744.

[38] *See* U.S. Patent No. 5,960,411 (filed Sept. 12, 1997) (issued Sept. 28, 1999). In *Amazon.com v. Barnesandnoble.com*, 239 F.3d 1343 (Fed. Cir. 2001), the Federal Circuit held that the 1-Click® patent could not be enforced by a preliminary injunction because there were "substantial questions" as to whether it patent was anticipated or obvious. *See also* John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 504–05 (2004) (using the one-click patent as an example of an obvious adjustment to new technological and business conditions).

[39] 122 F.3d 1476, 1477 (Fed. Cir. 1997).

[40] *F.D.A. Committee Acts on Drug*, N.Y. TIMES, Aug. 20, 1983, *available at* http://query.nytimes.com/gst/fullpage.html?res=9A00E5DC1738F933A1575BC0A965948260 (reporting committee recommendation).

recommendation, which it did in May of 1984.[41] Pseudoephedrine had long been approved as an over-the-counter cold remedy, and the prior art had combined it with the existing stable of over-the-counter painkillers. When ibuprofen was approved for over-the-counter sales, it was obvious that the new over-the-counter painkiller might be a good substitute for the old over-the-counter painkillers in the pseudoephedrine/painkiller combination.

A final case, *Sakraida v. Ag Pro, Inc.*,[42] shows that demand-side changes need not be particularly sudden in order to create obviousness problems. To understand the *Sakraida* case, one needs first to appreciate the precise invention alleged to have been made. Though the Supreme Court's opinion in *Sakraida* makes the patent at issue sound as if it were directed toward a new and nonobvious method for cleaning barns, that theory of patentability appears to have been manufactured during the litigation.[43] The actual patent was directed not to cleaning methods but to the entirety of a new "Dairy Establishment," wherein the "[p]asturing of cows [could be] completely eliminated" by having the cows "maintained in a large barn having various areas in which the cows rest, eat, and are milked on a controlled cyclical schedule."[44] The claims of the

[41] *See Richardson-Vicks Inc.*, 122 F.3d at 1484 (noting that trade publication in the pharmaceutical industry were anticipating that the FDA would approve ibuprofen for over-the-counter sales); *see also* Irvin Molotsky, *Agency Approves Painkiller for Over-the-Counter Sales*, N.Y. TIMES, May 19, 1984, *available at* http://query.nytimes.com/gst/fullpage.html?sec=health&res=9C00E7DC163BF93AA25756C0A962948260 (noting the FDA's final approval).

[42] 425 U.S. 273 (1976).

[43] The Supreme Court's opinion states that the "only claimed inventive feature" in the patented combination was "the provision for abrupt release of the water from the tanks or pools directly onto the barn floor, which causes the flow of a sheet of water that washes all animal waste into drains within minutes and requires no supplemental hand labor." *Id.* at 277. The Court's view of the patent was based directly on the patentee's own arguments, which was that "[t]he patented invention is limited to the construction and arrangement of the floor areas of the barn and the means for storing a volume of water on, or immediately above, the floor so that when the water is suddenly released, it will clean all of the floor areas without the use of any hand labor." Brief for Respondent at 5, Sakraida v. Ag Pro, Inc., 425 U.S. 273 (1976) (No. 75-110). The inventiveness of that aspect of the patent was supported in litigation by the patentee's expert witness, who testified that the abrupt release of water was inventive because it produced "a rolling action" of the water that cleaned better than a hose. *Sakraida*, 425 U.S at 277. Yet nothing in the patent specification suggested that some new cleaning mechanism had been discovered, and the invention was claimed as a combination that included many parts of the overall dairy establishment having nothing to do with the cleaning mechanism.

[44] U.S. Patent No. 3,223,070 col.1 lines 64–67 (filed Nov. 5, 1963) (issued Dec. 14, 1965). Sanitation of the barn was, of course, important to the success of the invention, but the patent specification included just a few sentences discussing the water flushing system. Moreover, those sentences described the flushing mechanism in general terms, stating little more than that the dairy should include angled floors and "[w]ater-dispensing means" that could be "automatically actuated at predetermined times to release relatively large quantities of water for washing the

invention also were directed not to a new cleaning system, but to the entirety of the automated "dairy barn," including stalls for the cows, milking areas, transfer routes to bring cows to the milking areas, automated feeding troughs, and the mechanisms for cleaning the barn with an abrupt release of large quantities of water.[45] Assuming that the combination of these components was in fact new, why then had the combination not occurred prior to 1963? The answer here seems pretty clearly to be that this novel combination was nothing more than an obvious substitution of capital for labor that occurred when the price of farm labor rose sufficiently, and the cost of mechanization fell sufficiently, to make the substitution worthwhile.[46]

Farms prior to 1963 did not use large, capital-intensive, automatic flushing systems in combination with the other automatic features of Ag Pro's dairy barn because hand labor was almost certainly less expensive than massive automation. This historical point explains why, rather than touting a new discovery of water flushing, the patent specification stresses how all the components in the dairy, not merely the flushing system, are designed to save labor.[47] Of course, labor-saving devices should be

barn floors." *Id.* at col.2 lines 28–31. *See also id.* at col.3 lines72–73 (mentioning that the dairy establishment needed a "means for releasing a relatively large amount of water to flush the alleys clean"). The specification stated that the "water-releasing means may *conveniently* take the form of dump tanks" (emphasis added) as illustrated in one of the patent's ten figures. In other parts of the specification, the patent also describes and illustrates a dam that can be used to hold and then release water. But nothing alerts a reader of the specification that the water dumping means described in the patent are part of some new or special cleaning method that had not previously been known.

[45] *See id.* at col. 6–7 (setting forth the patent's three claims).

[46] The relevant period in time, roughly the early 1960s, coincided with a massive reduction in the population devoted to farm labor. *See* BRUCE L. GARDNER, AMERICAN AGRICULTURE IN THE TWENTIETH CENTURY: HOW IT FLOURISHED AND WHAT IT COST 93 (2002) (showing a dramatic reduction in the population of rural farm labor during the period around 1960); Linda Lobao & Katherine Meyer, *The Great Agricultural Transition: Crisis, Change, and Social Consequences of Twentieth Century US Farming*, 27 ANN. REV. SOC. 103, 107–08 (2001) (noting that U.S. farm population declined tenfold during the period between 1940 and 1980 and setting forth a chart showing the decline in agricultural population was fifty-seven percent between 1950 and 1960). Moreover, farm mechanization picked up dramatically during this period, in part because economic conditions had slowed the pace during the depression prior to World War II. *See* TREVOR I. WILLIAMS, A SHORT HISTORY OF TWENTIETH-CENTURY TECHNOLOGY 92 (1982) (noting that "farm mechanization slowed up during the years of the depression between the wars").

[47] '070 Patent at col.1 lines 16–17 (noting that "[e]ver since man domesticated animals, their care and maintenance has involved a great amount of hand labor"); *id.* at col.1 lines 69–72 (noting that "[s]ubstantial hand labor and man hours are eliminated by keeping the cows relatively confined" and eliminating the need for taking the cows to and from a pasture); *id.* at col.2 line 29 (noting that the flushing tank can be set to dump water "automatically"); *id.* at col.4 lines 38–40 (noting that the stalls are equipped with an "automatic means" for placing "a predetermined amount of feed [in the feed box] each time a cow comes in the stall"); *id.* at col.6 lines 28–30 (noting that the dairy is designed to have cows move themselves "from

patentable if they involve some nonobvious advance. What should not be patentable is the mere use of capital in known ways to accomplish a thoroughgoing mechanization where exogenous economic forces have made such mechanization desirable.

C. Cases of Stasis

United States v. Adams[48]—one of the companion cases to *Graham v. John Deere Co.*[49]—provides an excellent contrast to the cases involving supply-side or demand-side change. The patent in *Adams* involved a novel battery that the United States argued was an obvious combination of components from the prior art. All batteries consist of two opposing electrodes and an electrolyte. Adams' battery was composed of two materials known to be good electrodes—magnesium and cuprous chloride—and plain water, which had also been used as an electrolyte in the prior art.[50] In its briefs, the United States conceded that "[i]t is true that Adams put together elements not actually combined before and obtained more favorable results, for some purposes, than had prior combinations."[51] But the government's view was that Adams merely "put into practice a battery composed of components which anyone 'skill[ed] in the art' would have listed as among the possible components of such a battery if asked to compile a list of the available . . . materials [for making a battery]."[52]

But if the parts used by Adams had previously been known as "possible components" of a battery, why did no one previously assemble them as Adams had? Was one of the components new to the prior art in 1938 when Adams invented? Or was the need for batteries, or a particular type of battery, new at that time? The facts of the case show that, rather than being somewhat new to the prior art, all the components had been well-known for a half century. So too, the need for good batteries was at least a half-century old and probably much older than that.[53] Those basic

one area to another at the desired times with a minimum of human effort"); *id.* at col.1 lines 43–44 (noting that prior pasturing of cows "is time consuming and entails considerable man hours").

[48] 383 U.S. 39 (1966).

[49] 383 U.S. 1 (1966).

[50] Adams v. United States, 330 F.2d 622, 630–34 (Ct. Cl. 1964) (describing the prior art).

[51] Petition for Writ of Certiorari to the United States Court of Claims at 11, United States v. Adams, 383 U.S. 39 (1966) (No. 55). In its briefs filed after certiorari was granted, the government flip-flopped on this point and argued that Adams' battery was *not* novel. Adams' attorneys pointed out the inconsistency and easily argued that the government's earlier concession, which was supported by the findings of the Trial Commissioner and the Court of Claims, was the only plausible view of the facts. Respondents' Brief at 62–76, *Adams*, 383 U.S. 39 (No. 55).

[52] Brief for the United States at 21, *Adams*, 383 U.S. 39 (No. 55).

[53] Adams' briefs pointed out that the new battery had satisfied a number of different needs (supplying power for signal lights, motors, emergency radio

facts of timing created an insurmountable problem for the government's obviousness argument. Indeed, the point can be seen particularly clearly in a passage from the record that Adams stressed in his briefing.[54] Adams's attorney questioned the government's expert:

> Q [by Adams's counsel]: Doctor, how is it that it took a man skilled in the art, I think you said, until 1938, to put the combination together, where all the components had been known in the art since 1888 for the last one? How do you explain the time lapse of 50 year or half century?
>
> A [by Dr. Joseph White, the government's expert, and Head of the Electrochemistry Branch of the Chemistry Division at the United States Naval Research Laboratory[55]]: I think this can't very well be answered. Maybe there was no need for it. Somebody has to have the need and the opportunity. I don't know.
>
> Q. You don't know?
>
> A. That is right.[56]

Thus, the history of the prior art shows stasis, not change, and against that history, the only reasonable explanation for the emergence of Adams' invention in 1938 is that Adams made some advance that was not obvious to others in the field.

D. Wrongly Decided Cases

Though a timing approach to obviousness can explain most results in the case law, there are a few exceptions. But those examples seem, if anything, to confirm the soundness of the timing approach, for the exceptional cases appear to be wrongly decided.

Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.[57] is the best example of a decision in which the Court ignored timing as evidence of nonobviousness and thereby reached a decision that was almost certainly incorrect. The invention was a simple device designed to speed the check-out process at supermarkets. As described by the Supreme Court, it was "a cashier's counter equipped with a three-sided frame, or rack, with no top or bottom, which, when pushed or pulled, will move groceries deposited within it by a customer to the checking clerk and leave them there when it is pushed back to repeat the operation."[58] In other words, the invention was a mechanical precursor to the now-

equipment, etc.), all of which were very old and long pre-dated Adams' discovery. *See* Respondents' Brief, *supra* note 35, at 54.

[54] *Id.*

[55] Record Appendix at 343–44, United States v. Adams, 383 U.S. 39 (1966) (No. 55).

[56] *Id.* at 382.

[57] 340 U.S. 147 (1950).

[58] *Id.* at 149.

familiar conveyor belt present at the check-out counter of most modern supermarkets, with the main difference being that this particular invention had to operated by hand.

The history of the invention, which was largely ignored by the Supreme Court, was well described by the court of appeals. The relevant problem "arose out of the institution of self-serve grocery stores, the first of which was the Piggly-Wiggly, established about 1917"[59]—a full two *decades* prior to the time of invention. Prior to "self-serve" grocery stores, customers would order goods from clerks, who would retrieve the items and then bring them to the check-out station. Self-serve stores allow customers to select their own goods as they roam through the store, and when the customers have all of their desired goods, they proceed to check-out stations typically located near the store's exits. The difficulty is that many customers can reach the check-out counter at the same time, producing "congestion" that was especially bad "on Saturdays and at rush hours."[60] Prior to the invention at issue, the only solution to the congestion problem was to install more check-out counters, which was expensive because it required "very valuable space near the front of the store," the "hiring of additional help," and "the purchase of additional cash registers."[61] The check-out congestion problem was "a real menace to the development of the self-serve store."[62]

The inventor in the case—Turnham—realized that checking-out process was not as efficient as it could be. Previously, customers had to place their groceries on a counter in front of the clerk, and the process of unloading the goods could cause delay as the clerk waited for the customer to place more items on the counter. Turnham's solution was to extend the counter so that, while the clerk was checking out one customer, the next customer in line could be unloading additional groceries onto the counter. Turnham's moveable, three-sided frame then allowed the groceries to be pushed toward the clerk as the clerk finished checking out the previous customer's goods.[63] The uncontradicted evidence in the record showed that "the stores which use this device have handled 30% more customers, taken in 30% more money than formerly, and thus greatly improved their efficiency."[64]

To determine whether this invention met the patentability standard, the Supreme Court applied its then-longstanding rule that "[t]he mere

[59] Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp., 179 F.2d 636, 637 (6th Cir. 1950).

[60] *Id.*

[61] *Id.*

[62] *Id.*

[63] *Id.*

[64] *Id.* The Supreme Court also noted as "beyond dispute" that "the resultant device works as claimed, speeds the customer on his way, reduces checking costs for the merchant, has been widely adopted and successfully used." Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147, 149 (1950).

aggregation of a number of old parts or elements which, in the aggregation, perform or produce no new or different function or operation than that theretofore performed or produced by them, is not patentable invention."[65] Turnham's invention failed that test, the Court believed, because no individual component in the invention was doing anything different from the general functions that such components had previously done. Thus, the elongated counter did "what a store counter always has done—it supports merchandise at a convenient height while the customer makes his purchases and the merchant his sales."[66] So too, the "three-sided rack will draw or push goods put within it from one place to another—just what any such a rack would do on any smooth surface—and the guide rails keep it from falling or sliding off from the counter, as guide rails have ever done. Two and two have been added together, and still they make only four."[67]

Even on its own terms, the Court's reasoning seems faulty. While it is true that each individual element in the invention was performing the same *general* function long known in the mechanical arts, the combination was doing something—speeding customers through check-outs and eliminating lines—that these elements had never done previously. But more importantly, the Court's intuitions about the case seem precisely backwards. The very evidence that the invention's components were very simple and long known in the art (they did what they "always ha[ve] done"[68]) tends to support the invention's nonobviousness. When that evidence is combined with the undisputed evidence that the problem addressed by the invention was decades old, a conclusion of nonobviousness seems inescapable. For years, many persons skilled in the art, who had full knowledge of relevant components and their general mechanical properties, were unable to see that the particular combination would perform the valuable function served by the invention.

Unlike the case of *Sakraida*,[69] the emergence of Turnham's invention can not be attributed to progressive substitution of capital for labor due to relevant changes in labor or capital costs. On this point, hindsight is actually helpful, for we can ask whether, armed with the knowledge disclosed in Turnham's specification, a self-service store in 1917, or 1925 or even 1935 would have found it worthwhile to use Turnham's simple device as a substitute for building more counters, hiring more clerks, and buying more registers. It seems unlikely that changes in factor prices, or any other reason, could explain why self-service stores had not previously

[65] *Great Atl. & Pac. Tea Co.*, 340 U.S. at 151 (quoting Lincoln Eng'g Co. v. Stewart-Warner Corp., 303 U.S. 545, 549 (1938)).

[66] *Id.* at 152.

[67] *Id.*

[68] *Id.*

[69] *See* text at notes 43–48.

adopted Turnham's device to ameliorate check-out congestion. Stores had not adopted the device because they lacked Turnham's insight.

While in *Great Atlantic & Pacific Tea Co.*, failure to appreciate timing evidence lead to an unjustified holding of unpatentability, a similar failure in *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*[70] led to an unjustified holding of patentability. The technology at issue in *Hybritech* was complex, but the facts are easy to describe. The innovation at issue in the case was the development of immunoassays (a diagnostic or test) that are based on monoclonal antibodies. The patentees in the case, Howard Green and Dr. Gary David, developed the alleged invention in early 1979, possibly as early as January 1979.[71] It was undisputed in the case that immunoassays based on monoclonal antibodies were wildly successful in the marketplace and that, in many medical circumstances, they filled a long-felt need for better diagnostic tools.[72] Were the insights of Green and David responsible for bringing to the world this great new technology? No, the facts point in another direction.

In August 7, 1975, or about three and one-half years prior to the alleged invention, Georges Köhler and César Milstein published an article in the scientific periodical *Nature* describing a technique for the production of monoclonal antibodies.[73] As the Federal Circuit recognized, the article described pioneering work for which Köhler and Milstein were later awarded the Nobel Prize in 1984.[74] Thus, at the time of Green and David's alleged invention, one essential component for the innovation had just recently become available, and it had become available through the efforts of others.

Of course, it is still possible that Green and David found some nonobvious application for this new component. The law should not preclude the possibility that one invention (immunoassays based on monoclonal antibodies) might follow closely on the heels of another invention (monoclonal antibodies). But the facts in *Hybritech* strongly support the conclusion that, once monoclonal antibodies were available, it was obvious to many people skilled the art that the new component could be used for assays. In their 1975 Nature article, Köhler and Milstein themselves had noted that their discovery could be harnessed "in massive cultures to provide specific antibody" and that "[s]uch cultures could be valuable for medical and industrial use."[75] At the time, however, Köhler and Milstein had the misfortune to be affiliated with U.K.'s Medical Research Council, a governmental institution that, by law, was required

[70] 802 F.2d 1367 (Fed. Cir. 1986).

[71] *Id.* at 1374.

[72] *Id.* at 1382–83 (setting forth evidence of commercial success and long-felt need).

[73] Georges Köhler & César Milstein, *Continuous Cultures of Fused Cells Secreting Antibody of Predefined Specificity*, 256 NATURE 495 (1975).

[74] *Hybritech Inc.*, 802 F.2d at 1371.

[75] Köhler & Milstein, *supra* note 53 at 497.

to have its researchers obtain bureaucratic approval prior to patenting their inventions. Though Köhler and Milstein sought approval, it was denied because the governmental official reviewing the matter thought that there would be no practical applications.[76] Thus, a highly valuable pioneering innovation fell immediately into the public domain.

Soon after the publication of Köhler and Milstein's discovery, individuals appreciated the potential application of the discovery in creating assays, and Green and David were merely one team among many that created immunoassays based on monoclonal assays in the same time frame.[77] Despite this evidence, the Federal Circuit held Green and David's patent valid, but it did so using two legal principles that are likely not good law today. First, the court stated that "'[o]bvious to try' is [an] improper consideration in adjudicating obviousness issue[s]."[78] Second, the court discounted the evidence of "simultaneous development," stating merely that it "may or may not be indicative of obviousness."[79] Both legal points now seem undermined by the Supreme Court's decision in *KSR v. Teleflex*. As we will see below in Part IV of this Article, the *KSR* decision generally clears the way for a timing approach to obviousness. In the case of *Hybritech*, *KSR* quite clearly overturns *Hybritech*'s holding that obvious-to-try is an "improper consideration"[80] and also strongly indicates that nearly simultaneous development should be given significant weight in obviousness analysis.[81]

[76] The story behind this bureaucratic bungle is explained in César Milstein, *With the Benefit of Hindsight*, 21 IMMUNOLOGY TODAY 359, 360 (2000). Köhler and Milstein were affiliated with the United Kingdom's Medical Research Council (MRC), and patent applications on the research of MRC scientists could be filed only by the U.K.'s National Research and Development Corporation (NRDC), which reviewed a draft of the Nature article and concluded that "'the general field of genetic engineering is a particularly difficult area from the patent point of view and it is not immediately obvious what patentable features are at present disclosed in the Nature paper.'" *Id.* (quoting letter from NRDC) (emphasis omitted). The NRDC also offered a pessimistic opinion of the commercial prospects for the discovery—an opinion that, as demonstrated by the discussion of commercial success in *Hybritech*, proved wildly wrong. *See* Letter from Nat'l Research Dev. Corp. to L.D. Hamlyn, Med. Research Council (Oct. 7, 1976) *available at* www.path.cam.ac.uk/~mrc7/mab25yrs/NRDClet.html ("[i]t is certainly difficult for us to identify any immediate practical applications which could be pursued as a commercial venture").

[77] *Hybritech Inc.*, 802 F.2d at 1380 n.4.

[78] *Id. at* 1380 (citing Jones v. Hardy, 727 F.2d 1524, 1530 (Fed. Cir. 1984)).

[79] *Id.* at 1380 n.4.

[80] KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1742 (2007) (holding that the Federal Circuit erred in concluding "that a patent claim cannot be proved obvious merely by showing that the combination of elements was 'obvious to try'").

[81] *Id.* at 1744 (looking to the nearly simultaneous development of the accused product in the infringement litigation as evidence tending to show the obviousness of the patent claim).

III. CAVEATS

Although timing considerations provide an excellent proxy for nonobviousness and therefore patentability, there are limitations to the approach. As discussed in Part III.A below, the competition to innovate does not guarantee the rapid discovery of obvious innovations in at least two discrete circumstances: (1) where a part of the prior art is secret; and (2) where the obvious innovation has negligible market value. Improvement patents also present special considerations, and these are detailed in Part III.B. Finally, as discussed in Part III.C, the nonobviousness standard itself has some important differences from a theoretically pure standard that would permit patents only in cases where the patent was necessary to induce the innovation.

A. Imperfect Competition to Innovate

Competition is not always perfect, and this is true also with the competition to innovate. This Part addresses two situations of imperfect competition. Fortunately, these situations are fairly easy to observe *ex post*, so courts and other legal actors can distinguish them from the many other situations in which the timing approach works well.

1. Secret Prior Art and the Supreme Court's Error in Cook Chemical

The timing approach to obviousness assumes that the relevant pieces of prior art are available to the field for all to see. If that condition is not met, then the competition to innovate will be imperfect. For example, real-world individuals who are skilled in the art may be unable to achieve an obvious invention because they lack access to one component of the invention. The clearest example of this is where a piece of so-called "secret prior art" is used to evaluate the obviousness of an innovation. In such circumstances, the failure of competitors to produce the innovation soon after the creation of the prior art is not necessarily good evidence of nonobviousness.

The most prominent example of the situation comes in the other of *Graham*'s companion cases, *Calmar v. Cook Chemical*.[82] There the Supreme Court held obvious a patent issued to Scoggin on a new type of hold-down cap for an insecticide pump sprayer. The Supreme Court held that the Scoggin invention was rendered obvious "[a]t the latest . . . in 1953 by the appearance of the Livingstone patent," which disclosed a hold-down cap for a bottle with a pouring spout.[83] The hold-down cap from the Livingstone patent was so nearly identical to Scoggin's cap that the only alleged difference between the two was that the Livingstone cap "relate[d] to liquid containers having pouring spouts rather than pump

[82] Graham v. John Deere Co., 383 U.S. 1, 26 (1966) (setting forth the decision *in Calmar v. Cook Chemical*).

[83] *Id.* at 36.

sprayers."[84] Yet the extreme similarity between the Livingstone and Scoggin caps presented a puzzle for the Court: If Scoggin's cap was only an obvious variant of the Livingstone cap, which entered the prior art in 1953, why did no firm in the insecticide industry develop a cap like Livingstone's until Scoggin did in 1956?

Normally, a pretty strong case of nonobviousness would be made out where several years passed during which (1) a market need for the relevant innovation existed and (2) all of the necessary components for the innovation were present in the prior art. But the reason such evidence makes a good case of nonobviousness is the assumption that, if the invention were obvious, people in the field would soon satisfy the market need by combining the known prior art. That assumption fails where the relevant prior art is unknown to real-world persons of skill in the art. In the *Calmar* case, the Livingstone cap entered the prior art in 1953 only in the form of a secret patent application. The cap was not actually divulged to the world until the second half of 1955, just months before the Scoggin cap was perfected.

The complete record of *Calmar* makes it quite clear that the Justices were unaware the Livingstone cap was secret prior art. In the opinion itself, the Court followed the convention of citing all but one of the relevant patents by their U.S. patent numbers and issue dates. The one exception is the Livingstone patent, which the Court cites as "Livingstone U.S. Patent No. 2,715,480 (1953)."[85] But 1953 is the filing, not issuance, date for the patent. Moreover, immediately after stating that the Scoggin patent became obvious "in 1953 by the *appearance* of the Livingstone *patent*," the Court explained away the delay in achieving the Scoggin cap by stating "no one apparently chose to avail himself of knowledge stored in the Patent Office and *readily available* by the simple expedient of conducting a patent search—a prudent and nowadays common preliminary to well organized research."[86] Contrary to the Court's opinion, the Livingstone patent application was not "readily available" prior to the beginning of Scoggin's research project. Finally, internal Court memos now publicly available in the papers of Justice Tom Clark (the author of the *Graham* trilogy) also confirm that the Justices and their clerks were unaware that the Livingstone patent was secret prior art until 1955.[87]

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[84] *Id.* at 35.

[85] *Id.* at 31.

[86] *Id.* at 36 (emphasis added).

[87] In fact, one Justice—Harlan—initially voted to sustain the patent. (The vote against Graham's patent was unanimous from the start.) After Justice Clark's opinion was circulated, however, Justice Harlan joined in, saying, "The only of the cases as to which I had any real doubt was Calmar, but you have convinced me on that score." Memorandum from Justice John M. Harlan *Re: Nos. 11, 37, and 43—Patent Cases* (Feb. 11, 1966) (Clark Papers Box A183, Folder 4). Justice Clark's law clerk, Charles Reed, also had a "first impression . . . that the result reached by the Court [majority] was wrong." Letter from Charles Reed to Justice Tom Clark, Supreme Court, at 2

The mistake in *Calmar* was unfortunate. Earlier in its opinion, the Court had stated that evidence of "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" and thereby "may have relevancy."[88] Yet the facts of the *Calmar* case—or rather the facts as the Court misunderstood them—appear to have dissuaded the Court from placing too much emphasis on such evidence. Confronted with an invention that seemed barely novel in light of the prior art, the Court was confident that the innovation could not be held nonobvious. Thus, to escape the apparent conflict between the direct evidence of obviousness and the timing evidence, the Court discounted the importance of the timing considerations, stating that in this particular case, the timing evidence did not "tip the scales of patentability."[89] That formulation makes timing considerations appear to play an important role only as a tiebreaker in cases where the other evidence is nearly balanced. Indeed, the Court for the first time ever declared such evidence to constitute "secondary considerations"[90]—a new term that had never been applied in any published decision. Previously, such considerations were known as "objective" evidence of obviousness or evidence concerning the "history of the art" (Learned Hand's phrase).[91] The *Graham* Court demoted all of this evidence to secondary status.

2. Arbitrary Design Choices and Low-Value Patents

Another relatively isolated situation in which timing considerations may fail involves some categories of low-value patents, especially those which cover arbitrary design choices. Patents on trivial design choices are sometimes useful to control markets for complementary products that, pursuant to normal antitrust doctrine, would normally be open to free competition. In such cases, a patent on a relatively trivial design choice may have significant value to one manufacturer, but the design choice itself has no intrinsic economic value. For example, a maker of razors, like Gillette, may wish to patent the precise form of the interface between

(undated) (Clark Papers Box A182, Folder 1) [hereinafter *Letter to Justice Tom Clark*]. Reed changed his mind, however, in writing a first draft of the opinion and ultimately concluded that "the arguments of long-felt but unsatisfied needs and commercial success" were "overbalanced" by the "direct evidence of the lack of unobvious differences in the prior art (viewing the invention as [Cook Chemical] did in the patent office)." *Id.* at 2–3. Both Harlan and Reed appeared to be convinced by the "direct evidence" of nonobviousness set forth in the draft opinions circulating in the Court. None of the internal Court memoranda on the case points out that the arguments of "long-felt but unsatisfied needs" were undermined by the legal inability of actual persons in the art to have access to the Livingstone design.

[88] *Graham*, 383 U.S. at 17–18.

[89] *Id.* at 36.

[90] *Id.* at 17.

[91] *See* discussion *infra* note 110.

its razor handles and razor blades.[92] If it can obtain such a patent, the firm may be able to foreclose competition in replacement blades for its razors. Similarly, a maker of printers may wish to patent the configuration of its ink cartridges so that it can prevent firms from competing with it in the market for replacement cartridges. In both such cases, the patent may have value to the particular firm even though the patented innovation—an arbitrary design—is no better (or worse) than many other possible configurations.

Timing considerations will not identify obvious patents on arbitrary design choices because the innovation itself is not at all valuable and thus the failure of competition to produce the innovation provides little insight into whether the configuration is obvious or not. Yet such trivial patents likely do not represent the typical situation. Furthermore, courts may be able to identify this class of patents with relative ease, for they are most likely to arise where the patent itself seems important for a product-tying strategy, and they are likely to cover innovations that have no apparent superiority to other potential designs. Finally, the stakes associated with such patents are somewhat lower than cases where a patent has been issued on an obvious but economically valuable technology. Patents on arbitrary designs may help certain product manufacturers exclude competition from the market for replacement parts and other complementary products, but those firms remain subject to competition for the initial product.

B. Special Timing Considerations for Improvement Patents

Where one initial or pioneering patent covers a basic technology, patents on improvements to that basic technology are subject to special timing considerations. First, the existence of the earlier patent affords the pioneer patentee a fairly strong incentive to develop improvements that increase the market for the technology. This consideration tends to suggest that the patentability standard should perhaps be more stringent, because the reward of the second patent may be unnecessary to encourage the pioneering patentee to develop the improvement.

A counterbalancing factor, however, is that the social cost of the improvement patent is much diminished because the early years of the improvement patent would overlap with the pioneering patent. Thus, the

[92] *See, e.g.*, Essex Razor Blade Corp. v. Gillette Safety Razor Co., 299 U.S. 94 (1936). *Essex Razor* provides the classic scenario in which a manufacturer was trying to patent an arbitrary design choice so as to foreclose competition in the market for replacement parts. The Essex Razor Blade company sold only replacement blades. *See id.* at 94. Gillette, the patentee, sold blades and the safety razors that hold the blades. *See id.* at 95. Gillette's patent was not its original pioneering patent on the safety razor (which had issued in 1904 and had long since expired), but on a particular configuration for interface between the blades and the razor handle. The Court invalidated that patent on the ground that it was merely one of several different "alternative means obvious to any mechanic." *Id.* at 98.

social cost of the improvement patent may not be 20 years of exclusivity, but rather a few years of exclusivity that will occur years in the future. A good example of this effect is found in *Pfizer, Inc. v. Apotex, Inc.*[93] Pfizer owned a pioneering patent on amlodipine and an improvement patent on a particular salt of amlodipine.[94] The pioneering patent expired on July 31, 2006,[95] while the improvement patent terminated approximately eight months later on March 25, 2007.[96] In such a case, the social cost of issuing the improvement patent is merely a few additional months of exclusive rights. Moreover, at the time when the improvement patent was being issued (in 1989),[97] those additional months of term were years into the future and thus the social cost of those months must be appropriately discounted to present value. This consideration tends to militate in favor of a less demanding standard for granting improvement patents.

Improvement patents may be subject to other special considerations as well. For example, the competition that typically occurs prior to patenting may be a much less perfect form of competition because the pioneer has higher economic incentives to achieve the innovation.[98] Another important consideration is that, if pioneering patentees are denied improvement patents, the improvements may be maintained as trade secrets in situations where disclosure would be more socially beneficial.

These special considerations are discussed here merely to note that the grant of improvement patents to a pioneer patentee may present issues different from the canonical situation in which many similarly situated inventors are seeking patents conferring immediate market exclusivity. The unique aspects of improvement patents seem sufficiently great as to demand more detailed treatment than can be accomplished in this Article.

C. Nonobviousness as Approximation: Divergence from a Patent-Induced Standard

This Article has generally assumed that the nonobviousness standard is largely congruent with what might be called the patent-induced standard—i.e., the theoretically perfect standard that grants patents only to those innovations for which the patent is necessary to produce innovation. In fact, nonobviousness is only an imperfect proxy for the theoretically attractive patent-induced standard. Yet to the extent that

[93] 480 F.3d 1348 (Fed. Cir. 2007).

[94] *Id.* at 1352–54.

[95] *See* Pfizer, Inc. v. Dr. Reddy's Labs., Ltd., 359 F.3d 1361, 1364 (Fed. Cir. 2004) (resolving the expiration date of the pioneering patent on amlodipine).

[96] *Pfizer*, 480 F.3d at 1352 (noting that, if not invalidated, the patent would have precluded generic competition until September 25, 2007, which included a six-month period of exclusivity after the date of patent expiration).

[97] *Id.* at 1356 (noting that the amlodipine salt patent was granted in 1989).

[98] For an explanation of this effect, see John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439 (2004).

there are differences between the two standards, a timing approach to obviousness analysis tends to narrow those differences.

For example, a standard of patentability based on nonobviousness might be over-inclusive in the following situation: Sometimes an innovation may be *not* obvious to people of *ordinary* skill in the art but nonetheless easily attainable by a small but significant minority who are spurred on by nothing more than normal market incentives. In such cases, a strict patent-induced standard would suggest denying patentability while a nonobviousness standard would seem to support patentability. A timing approach to nonobviousness would, however, tend to push the nonobviousness standard toward the patent-induced standard because the rapid production of the innovation by a significant number of innovators would be viewed as strong evidence of obviousness.

The nonobviousness standard may also be somewhat underinclusive. Sometimes an innovation may be obvious to a person of ordinary skill if, as the law presumes, that person has perfect knowledge of all the relevant prior art. But in the real world, actual artisans do not operate with perfect knowledge, and without the incentives provided by exclusive rights, they may not have sufficient incentives to seek or to comprehend all of the relevant prior art that may be necessary to bring forth an innovation. A timing approach to obviousness again may move patentability towards a patent-induced standard. If actual artisans are unable to achieve the innovation during a significant period of time, then that evidence would tend to support patentability even though the innovation may have been easy to achieve had some obscure piece of prior art been known.

IV. A DOCTRINAL ROADMAP TO TIMING

This Part of the Article addresses the important question whether the timing approach advanced here can be implemented without avulsive change to existing legal doctrine. The answer is a resounding "yes," and indeed the Supreme Court's recent decision in *KSR* makes this a particularly opportune time for the courts to move toward a timing approach.

The polestar of obviousness jurisprudence is the Supreme Court's *Graham v. John Deere*[99] decision, but that case provides little more than a general framework. *Graham* requires three basic factual questions to be decided as "background" and then instructs courts that "the obviousness or nonobviousness of the subject matter is determined" in light of those factors.[100] As previously mentioned, the *Graham* Court permitted courts to use "secondary" considerations in determining obviousness, but in the *Calmar* case, the Court spoke of those factors as not being able to "tip the

[99] 383 U.S. 1 (1966).

[100] *Id.* at 17.

scales of patentability"[101]—a passage that, especially when coupled with the Court's description of the factors as "secondary," seemed to indicate that objective measures of obviousness should take a backseat to judicial analysis. Because of *Graham*'s apparent marginalization of objective factors, the key question since *Graham* has been the precise mechanism by which courts should determine obviousness through judicial analysis. For most of the past quarter century, the Federal Circuit supplied an answer: An invention would not be considered obvious unless, prior to the time of invention, there was a teaching, suggestion, or motivation to make the invention.[102] As an exclusive means for deciding obviousness questions, that doctrinal test ended with the Supreme Court's 2007 decision in *KSR v. Teleflex*.

The Court's decision in *KSR* makes this time a crucial period for the development of obviousness law and seems to encourage the development of fresh approaches. The Court rejected the Federal Circuit's "rigid approach"[103] to determining obviousness but avoided erecting any sort of comprehensive doctrinal edifice as a replacement. Rather, the Court restated several "principles" drawn from the Court's prior precedents and required that future case law be developed "[f]ollowing these principles."[104] Moreover, the Court's overarching theme in the decision was that obviousness doctrine should be developed and applied in a "flexible" rather than a "rigid" manner, with an "expansive" and "broad inquiry."[105] That mandate seems to point courts toward more consideration of the facts of each case. A timing approach merely helps courts to decide *which* facts should be emphasized so that any doctrinal rigidities can be "flexed" in the correct direction.

Four doctrinal reforms would help move the courts toward a timing approach to obviousness. First, while the factual considerations necessary for applying a timing approach to obviousness are already recognized in current law as relevant "secondary considerations," the courts should be willing to give such considerations more weight than has been given in the recent past. As part of this reform, the very terminology "secondary considerations" should be abandoned in favor of the more traditional—and more accurate—description: "objective considerations." No court prior to *Graham* had ever described this type of evidence as

[101] *Id.* at 36.

[102] The test began in 1984 to 1985. *See ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577 (Fed. Cir. 1984) (holding that, in determining the obviousness of claimed subject matter, "teachings of [prior art] references can be combined *only* if there is some suggestion or incentive to do so") (emphasis in original); *Ashland Oil v. Delta Resins & Refractories*, 776 F.2d 281, 297 (Fed. Cir. 1985) (holding that, to invalidate a patent as obvious, a district court set forth the "factual teachings, suggestions or incentives from th[e] prior art that show[] the propriety of [the patented] combination").

[103] KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1739 (2007).

[104] *Id.* at 1740.

[105] *Id.* at 1739.

"secondary."[106] Rather, courts prior to *Graham* described this sort of evidence as "objective" factors (or considerations or evidence) of nonobviousness.[107] The trend had been to place greater reliance on such evidence as it was considered more reliable than a judge's own "subjective" assessment of whether the invention was difficult or easy to make.[108] The great Judge Learned Hand was one of most ardent champions of this approach. As early as 1923 when still a district judge, he wrote that the "history of the art is a safer test" for determining whether an achievement was beyond ordinary skill rather than "speculat[ing] a priori upon what new steps are within the imagination of an ordinary journeyman."[109] Learned Hand continued to endorse using "the history of the art" as a primary and more reliable test throughout his career,[110] and until *Graham*, he was succeeding in bringing along other courts and commentators.

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[106] This assertion is based on a Lexis search of all cases decided prior to *Graham* containing the word "patent" that also included the word "secondary" within one word of "considerations," "factors," "tests" or "evidence." (Search was "date bef 2/21/1966 and patent and (secondary w/1 (considerations or factors or tests or evidence))). No case used the word "secondary" in any context similar to the way it has been used since *Graham* to describe the historical proof of obviousness.

[107] *See, e.g.*, *In re* Cable, 347 F.2d 872, 878 (C.C.P.A. 1965); Allen v. Standard Crankshaft & Hydraulic Co., 323 F.2d 29, 34 (4th Cir. 1963); Griffith Rubber Mills v. Hoffar, 313 F.2d 1, 5 (9th Cir. 1963).

[108] For example, the Fourth Circuit in *Allen*, 323 F.2d at 34 (citations omitted), admonished lower courts:

> In approaching the question of obviousness, however, judges should mistrust their subjective notions if there are objective indicia to guide their judgments. Though the answer after the event may appear simple, the Court should not convert its simplicity into obviousness in the face of hard proof of recognized need for the answer, of long, unsuccessful search for the answer by people of skill in the art, of recognition by the industry that the claimed invention was the answer, and of its prompt adoption with attendant commercial success. Even a substantial combination of some of such criteria ought to outweigh a judge's subjective convictions that if one as skilled as he had really looked for the answer, he immediately could have put his finger upon it.

[109] Todd Protectograph Co. v. Safe-Guard Check Writer Co., 291 F. 613, 614 (S.D.N.Y. 1923).

[110] Learned Hand authored more than twenty opinions in which he championed the "history of the art" as the most reliable benchmark for deciding patent validity questions. *See, e.g.*, Conmar Prods. Corp. v. Universal Slide Fastener Co., 172 F.2d 150, 153 (2d Cir. 1949) (stating that the impressions of obviousness "should always yield to any evidence drawn from the history of the art"); Condenser Corp. of Am. v. Micamold Radio Corp., 145 F.2d 878, 879 (2d Cir. 1944) ("we have again and again said that in deciding the issue of invention we would look to the history of the art"). As late as 1960, Judge Hand summarized his view of the statutory obviousness standard:

> The test laid down [in § 103] is indeed misty enough. It directs us to surmise what was the range of ingenuity of a person "having ordinary skill" in an "art" with which we are totally unfamiliar; and we do not see how such a standard can be applied at all except by recourse to the earlier work in the art, and to the general history of the means available at the time. To judge on our own that this

Graham's description of historical factors as being "secondary" seems to have pushed the law away from the direction that Learned Hand had been advocating, but there are several good reasons to rethink that step. Most importantly, recent historical work has now made clear that the Supreme Court in *Graham* was laboring under a mistake about the record in one of the cases before it.[111] The Court incorrectly believed that the key piece of prior art in the *Calmar* case had been publicly available for years prior to the alleged invention at issue. That mistake presented the Court with a choice it need not have faced: What should a court do when the objective evidence seems to point in favor of nonobviousness, but yet the judges' own analysis strongly suggests that the invention is an obvious variation of prior art? The Court answered that question holding that courts should follow their own analysis of obviousness despite the objective evidence, and that decision may account for why the Court lowered the status of objective factors to "secondary" importance. If the Court had appreciated the actual facts of the case, it would have realized the objective criteria did *not* provide evidence of nonobviousness because the relevant prior art was not public until just before the invention at issue.[112]

Also, *Graham*'s demotion of objective factors to secondary status has less force if many cases are viewed as being close ones, in which *Graham* itself allows courts to use objective evidence to "tip" the scales of patentability.[113] If courts are more skeptical of their own analysis of obviousness, then the objective indicia of obviousness naturally take on more importance. The recent controversy over the correct articulation of the obviousness standard, punctuated by the *KSR* decision, provides fairly concrete evidence that judges should view many patents as falling within the class of cases in which reasonable minds could differ, and it is within that class that objective evidence of patentability can have determinative weight under *Graham*.

In sum, *Graham's* demotion of objective evidence was a misstep, but similar mistakes are common in the history of developing obviousness

> or that new assemblage of old factors was, or was not, "obvious" is to substitute our ignorance for the acquaintance with the subject of those who were familiar with it. There are indeed some sign posts: e.g. how long did the need exist; how many tried to find the way; how long did the surrounding and accessory arts disclose the means; how immediately was the invention recognized as an answer by those who used the new variant?

Reiner v. I. Leon Co., 285 F.2d 501, 503–04 (2d Cir. 1960).

[111] *See* discussion in Part III.A.1, *supra*.

[112] As even Learned Hand noted, objective evidence from the history of the art was not probative where the crucial piece of prior art was an unpublished patent application that was not available to actual people of skill in the art. *See Conmar Prods. Corp.*, 172 F.2d at 152–54.

[113] 383 U.S. at 36.

law.[114] The courts should not be afraid to correct such missteps when they are revealed. Fortunately, the corrective step required involves only a very modest adjustment to current doctrine—a slight elevation for the status of objective evidence and a slight demotion for the judicially developed tests for obviousness.

A second important reform to current legal doctrine is even more modest: Courts should refrain from lumping together all the "prior art" as if it were a homogenous category. The standard language of patent law—and indeed the structure of obviousness analysis established by *Graham*—requires courts to determine the scope and content of "the prior art." While that task is certainly necessary, the courts should not stop there; they should recognize that each piece of prior art comes with a *vintage*. A crucial fact to determine is not only *whether* something is prior art, but also just *how prior* it is. Obviousness analysis should be much different where all of the relevant prior art is ten years prior to the time of invention than when it is merely ten months prior.

As a third reform, courts should recognize that objective considerations can only be given proper weight if they are viewed within a proper theoretical structure; a timing approach provides that theoretical structure. Thus, for example, the objective considerations of a "long felt need" and "failure of others" have long been noted to be especially good proxies for nonobviousness.[115] But a timing approach teaches that those objective factors should weigh heavily only where the components to solve the long felt need were also in existence for a long period—as was true in *Adams*. Conversely, even when combined with the failure of many others, long felt need should mean little or nothing in two situations: (i) where, as was true for Selden's patent and the patents at issue in *Hybritech*, the alleged inventor has access to a newly created component, developed by others, that makes the solution to the problem much easier; or (ii) where, as in *Calmar*, the crucial piece of prior art was held in secret.[116] A timing approach also suggests that a need should not have to be long *felt*. A long *existing* need should be viewed every bit as favorably as a long *felt* need, provided that the inventor—not some other party—was the first to perceive the specific problem (and, of course, provide the solution). In such cases, the inventor's nonobvious contribution may lie more in perceiving the problem than in solving it,

[114] *See* John F. Duffy, *Inventing Invention: A Case Study of Legal Innovation*, 86 TEX. L. REV. 1, 4 (2007) (tracing the historical development of the obviousness standard and noting that "legal doctrines later seen to reflect deeply flawed policy can remain stable law for large portions of a century before their downfall").

[115] *See, e.g.,* Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1054 (Fed. Cir. 1988).

[116] Once again, Learned Hand understood this point. *See Conmar Prods. Corp.,* 172 F.2d at 153–54 (ruling that the prior history of the art to achieve the invention provides no help to the judicial analysis where the crucial piece of prior art was a secret pending patent application).

but that form of inventive contribution—recognizing and solving a previously unseen problem—should suffice to merit a patent.[117]

Using a timing approach to provide a theoretical framework for obviousness will also help courts to appreciate that not all objective considerations are created equally. As many commentators have previously noted, commercial success is the weakest of all objective considerations. Edmund Kitch noted, over forty years ago, that giving significant weight to commercial success is functionally equivalent to a presumption that all litigated patents should be held valid, because the mere fact of litigation is in almost all circumstances evidence of

[117] This point is clearly made in *In re* Nomiya, 509 F.2d 566 (C.C.P.A. 1975), where the court held:

> [If] there is no evidence of record that a person of ordinary skill in the art at the time of appellants' invention would have expected the problem in the [relevant prior art device] to exist at all, it is not proper to conclude that the invention which solves this problem . . . would have been obvious to that hypothetical person of ordinary skill in the art.

Id. at 572. *See also Ex parte* Campbell & Knoshaug, 211 U.S.P.Q. 575, 576 (U.S.P.T.O. Bd. App. 1981) (holding subject matter nonobvious where "[a]lthough the solution to the problem would have been obvious once recognized, none of the prior art before us indicates any recognition of the existence of the problem").

Professor Chisum rejects the authority of these cases and argues that innovators should not be entitled to patents where they are first to recognize a previously overlooked problem if the solution to that problem, once recognized, would be obvious to a person of skill in the art. Despite the contrary case law, Professor Chisum argues in favor of his position on the theory that patents should "issue only for new and nonobvious *solutions* to technological problems." DONALD S. CHISUM, CHISUM ON PATENTS § 5.04 (2005). Professor Chisum, however, conflates two quite different situations: (1) situations where the alleged inventor was "the first to encounter" a problem, and (2) cases where the inventor was the first to "perceive" an existing but undetected problem. A timing approach to patentability distinguishes sharply between the two. Where an alleged inventor happens to be the first to encounter a new but obvious problem that has an obvious solution, then a patent should not issue. Indeed, Supreme Court authority backs up this result. *See* Hollister v. Benedict & Burnham Mfg. Co., 113 U.S. 59, 73 (1885) (holding unpatentable an improvement that arose "[a]s soon as the mischief became apparent, and the remedy was seriously and systematically studied by those competent to deal with the subject"). But where an inventor is first to perceive a previously unrecognized problem, the solution should be patentable even if the solution itself is obvious once knowledge of the problem exists. This later situation is akin to (if not precisely identical to) *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45 (1923), where the Court held that a solution was patentable even though the solution would have been obvious once the source of the problem had been discovered. From the perspective of a timing approach to patentability, the key fact in *Eibel Process* was the one that the Court emphasized: Detection of the relevant problem had eluded everyone for "a decade." *Id.* at 68. By contrast, Professor Chisum argues that the key fact in *Eibel Process* was that the inventor was detecting the *source* of a problem rather than the *existence* of a problem. Contrary to Professor Chisum's approach, cases such as *Nomiya* stand for the proposition that, if people skilled in the art failed even to perceive the existence of a problem, the achievement of the inventor in seeing the problem should be viewed at least as favorably as the achievement in *Eibel Process*.

commercial success.[118] While a timing approach tends to confirm commentators' skepticism of commercial success as a reliable indicator of nonobviousness, there are some caveats. Commercial success may still be probative of nonobviousness where the patent right holder or parties licensed by the patent right holder entered the market with the patented product or service and enjoyed immediate commercial success. Since patentees and their licensees generally have access to the information in the patent specification at least 18 months prior to other parties,[119] the immediate commercial success of patentees and their licensees tends to show that the information in the patent was valuable and not obvious to other participants in the market. Moreover, the commercial success by patentees and their licensees tends to show that those parties risked investment in bringing the patented good into the market, and the property rights provided by the patent may have been necessary to encouraging that investment.[120]

By contrast, commercial success by *others*—parties not licensed by the patentee, and especially those who have independently created the patented subject matter—tends to provide affirmative evidence of *obviousness*. Such cases show that other innovators were able to duplicate the innovation at nearly the same time and that the market prospects of the innovation were so certain that no property rights were necessary to call forth investment in commercialization. Thus, a timing approach strongly suggests that commercial success should be divided into two categories: Type 1 commercial success, which is success by the patentee or persons in contractual privity with the patentee; and Type 2 commercial success, which encompasses success by all others. Only Type 1 commercial success should viewed as probative of nonobviousness, and even then it should be so viewed only in certain circumstances. Type 2 commercial success should generally be seen as objective evidence of obviousness, not nonobviousness.

The fourth and final reform suggested by a timing approach has already been introduced in the discussion on commercial success: Objective factors should be considered *symmetrically*, with some factors tending to show nonobviousness and others showing obviousness. This reform is entirely consistent with the Supreme Court's opinion in *Graham*, which was careful to describe objective evidence as "indicia of

[118] Edmund W. Kitch, *Graham v. John Deere Co.: New Standards for Patents*, 1966 SUP. CT. REV. 293, 333 ("In fact, if one is willing to infer from the litigation itself that the patent is valuable because it is worth litigating, and that since it is valuable it must be commercially successful, one ends up with the rule that all patents that are litigated should be held valid.").

[119] The patent application is not disclosed to the world for at least 18 months after it is filed. *See* 35 U.S.C. § 122(b) (2000); ROBERT P. MERGES AND JOHN F. DUFFY, PATENT LAW AND POLICY 63–64 (4th ed. 2007) (noting that other countries adhere to an 18-month publication rule).

[120] *See* Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. (forthcoming 2008).

obviousness or nonobviousness."[121] Unfortunately, patent practice has tended to develop so that secondary considerations are typically employed to rebut a "prima facie" case of obviousness or otherwise challenge obviousness determinations reached through application of one or another legal test of obviousness. As a result, objective evidence is almost always presented, when it is presented, by patentees and patent applicants as evidence of nonobviousness. Both the PTO and the courts should encourage a more balanced approach and should overtly allow consideration of objective evidence of obviousness. In particular, objective evidence of nearly simultaneous independent invention should be given much greater weight, and where other independent creators reached similar innovations at nearly the same time without even bothering to seek a patent on the innovation, such evidence should almost always be considered conclusive of obviousnesss.

The doctrinal reforms suggested here may be accurately viewed as encouraging a revival of the approach advocated more than half a century ago by Learned Hand, who sought to test obviousness using *history* of the art. A timing approach provides a sound theoretical justification for a more Handian approach to the obviousness question. The courts should not fear moving in that direction, even though it may require some adjustments to current doctrine. Learned Hand displayed great wisdom in many areas of the law. We should not be surprised to find that he was insightful in this area too.

V. CONCLUSION

A timing approach to judging obviousness cases holds out the twin hopes of providing more definiteness to the legal analysis and of harmonizing the statutory standard with a more general policy goal of patenting only those innovations for which the patent incentive is necessary. Timing considerations are also remarkably successful in predicting the circumstances in which obviousness problems are most likely to arise. In a few cases a timing approach suggests a different outcome than that actually reached by the courts, but those cases appear to be among the weaker and more controversial obviousness decisions. Finally, an emphasis on timing in obviousness analysis is theoretically attractive because it connects patentability determinations with an important and salutary feature of the patent system—the pervasive, competitive racing for innovations that the patent system strives to foster.

[121] Graham v. John Deere Co., 383 U.S. 1, 18 (1966).