

Module 104

[The following is a transcript of the recorded lecture for Module 104 of the PatentX course. The recording of the lecture itself is available through <https://ipxcourses.org>. Stripped of the accompanying slides and other visual materials, the transcript will likely be hard to follow. It is not intended to be a free-standing document. Rather, its purpose is to assist students, who have already watched the lecture, when reviewing the material.]

A. Novelty

Hello. I'm Terry Fisher. This is part of a series of lectures on Patent Law. I'll be focusing today on the two most important requirements for patent protection. The first is typically referred to as Novelty. The second goes by various names. In most of the world, it's called the "inventive step" requirement; in the US, it's called nonobviousness.

I'll be considering these two issues together because they both involve the degree to which an invention can fairly be described as new.

In this initial presentation, I'll provide an overview of the policies implicated by the novelty requirement and a brief tour of the diverse ways in which the requirement is interpreted and applied throughout the world.

I'll then dive into the complex and idiosyncratic way in which novelty is interpreted in the United States. If you are watching this lecture as part of the WIPO/Harvard course on Patent Law and the Global Health Crisis, that portion is optional.

Last but not least, I'll approach from an historical and comparative standpoint the inventive-step requirement, widely considered the heart of patent law.

Let's begin with a simple case. Suppose that, frustrated with the complexity and cost of the technology necessary to record these lectures, I invent today (February 14, 2023) a simplified but high-quality lapel microphone suitable for solo recording. Unbeknownst to me, two years ago, another frustrated teacher (we'll call him John Doe) invented a functionally identical microphone – and wrote a blog post describing it in detail. I never saw that blog post; when inventing my microphone, I received no benefit whatsoever from it. Can I patent my invention? In every country in the world, the answer is no.

The principle underlying this result is very important. Patent law demands more than originality; it demands novelty.

In this sense, patent law contrasts sharply with copyright law. To take a classic illustration, if, never having read or heard a poem written and published by someone else, I later write an identical poem, I acquire a copyright in my poem. But if, never having seen or learned about an

improved microphone invented and sold by someone else, I later invent an identical microphone, I cannot acquire a patent on it.

The principle is typically justified on ground that patents are an “embarrassment” to the public, in the sense that they impede competition and cause prices to rise, and we should not tolerate that embarrassment unless the public gains in some way from the issuance of a patent, which would not be true if the invention already existed.

But that explanation is not altogether convincing. For one thing, it would seem equally applicable to copyrights. For another, it’s not clear that the public would always suffer from a rule permitting the patenting of an original but non-novel invention. Returning to our example, suppose that Professor Doe, after publishing his blog, never sought to manufacture embodiments of the invention – and no one else did either. If I were able to obtain a patent on my invention, I would build a factory and sell lots of copies – and many people would benefit. If I don’t have a patent, I won’t do that, because I will face corrosive competition. Under circumstances of that sort, the novelty requirement injures, rather than, benefits the public at large.

Underlying this simple example are some contested aspects of intellectual-property theory. To explore them, I’m going to turn to a map, which summarizes the main branches of IP theory.

Nowadays, the most influential theory of intellectual property law in general and patent law in particular is known as reward theory, also known as incentive theory. I introduced it briefly during middle portion of the first lecture, when discussing the knee brace. Here’s a brief recap.

Reward theory is a branch of utilitarianism, the general philosophic framework that advocates shaping laws in ways that will promote the greatest good of the greatest number of people. The heart of reward theory is that inventions fall into a narrow but highly important category of products that economists refer to as “public goods.”

Most kinds of products, economists argue, are rivalrous and excludable. The meanings of those terms are best seen by example. An apple can only be eaten by one person. It’s relatively easy for the person who grows an apple to exclude other people from access to it – simply by maintaining possession of it until it is eaten. By contrast, knowledge of how to build a better mousetrap or microphone can benefit myriad people. If I make a better mousetrap, I can give you the benefit of it without forfeiting my own ability to rid my house of pests – merely by telling you how it’s done. For the same reason, once knowledge of how to make a better mousetrap or microphone becomes public, it’s very hard to exclude anyone from access to it.

Partly for these reasons, public goods tend to have large social benefits. But partly for the same reasons, there’s a danger that, unless the law intervenes in some way, they will not be produced in socially optimal numbers. Why? Because someone considering inventing a new mousetrap or microphone will not do so if he has no way of charging people for access to his invention.

Patent law, so the argument goes, provides inventors a way of charging for access to their creations – and thus stimulates socially beneficial inventive activity that otherwise would not occur.

Reward theory, as I say, is extremely influential – and has many variations and doctrinal implications. We'll come back to some of them later in this course.

For now, I want to emphasize that it's not the only branch of utilitarianism. There are two others – less well known, but relevant to the requirement of novelty.

One is known, somewhat pretentiously, as “signaling theory”. Its key idea is that patents may generate social benefits, not by incentivizing innovation, but by facilitating efficient communication of information from inventors to potential investors in startup firms created by the inventors.

The other has come to be known as “commercialization theory.” Its key idea is that patents are socially beneficial, not so much because they incentivize innovation, but because they incentivize commercialization of innovations. Refining an invention sufficiently to make it commercially viable, then building the facilities necessary to manufacture it, then marketing it are all costly. A company will be reluctant to incur those costs if other companies can quickly enter the field and ride for free on its investment. A patent gives the company that first commercializes a technology a time-limited monopoly to induce it to enter the field. In short, viewed from this angle, what patents incentivize is not innovation, but commercialization.

With that brief sketch of the competing theoretical positions, let's return to the topic at hand. As is likely now apparent, reward theory, the dominant justification of the patent system, supports a novelty requirement. Awarding a patent to someone who re-invents something is pointless. If the technology already exists, you don't need a patent to incentivize it. And when you don't need a patent, you should not use one. Hence patents are only awarded to novel things.

The implication of signaling theory for novelty is less clear cut, but it probably points in the same direction. One of the things that a patent is supposed to signal is the innovativeness of the leaders of a company seeking to raise funds. Granting a patent to someone who has not created something new would introduce static into that signal.

By contrast, commercialization theory is hostile to the novelty requirement. If an inventor has failed to commercialize his invention and, like Prof. Doe's microphone, it's just lying around unexploited, we should grant a patent to someone who can credibly commit to commercializing it.

In short, the wisdom of the novelty requirement is debatable. But that's not to suggest that the requirement is unstable. On the contrary, as I've indicated, in every jurisdiction in the world,

patents are only awarded for novel products and processes, and it's highly unlikely that any jurisdiction would jettison the requirement.

We turn now from novelty doctrine in general to some important details. One of the reasons why novelty comes up often in patent litigation is that interpretation and application of the doctrine requires settling lots of questions concerning its precise ambit. Here are three. There are lots of others, but these three will suffice for now.

First, what's the terminal date for relevant prior art? To illustrate, let's go back to the microphone case.

Suppose I first conceive of my invention at this moment in time.

A few months later, I built a prototype – sometimes known as reduction to practice.

A few months after that, I apply for a patent

18 months later, my patent application is published

A few months after that, the patent is granted.

With my patent in hand, I bring an infringement suit against a competitor. The defendant seeks to invalidate my patent on the ground that, previously, Professor Doe had invented the same thing.

If the defendant is able to establish that Doe invented his microphone and published his blog before I came up with the idea, then I will surely lose.

But what if Doe did not alert the world until here? Or here? Or here? Or here?

Until recently, a few jurisdictions – most notably the US – treated the moment of conception as the cutoff point. No longer. Today, all jurisdictions treat the date on which the patent application is filed as at least the presumptive cutoff date.

Next issue: How public must Doe have been in order to invalidate my patent. This issue arises in a variety of scenarios. When resolving them, European jurisdictions, including the European Patent office, generally speaking ask: did Doe's activity give skilled members of the public enough information to replicate the invention? By contrast, in the United States, the patent office and the courts are more likely to ask: did Doe's behavior place an embodiment of the invention in the public domain, even if not in a way that would effectively transfer to the public the underlying technological knowledge?

The issue on which jurisdictions vary the most is known as the grace period. The principal context in which this issue arises involves activities, prior to the date on which the application is

filed, not by third parties (like Prof. Doe) but by the inventor himself. Suppose, for example, that, before I file my application, I use my microphone to record a lecture and the microphone is visible in the recording that I publish on the Internet. Or suppose that I describe it at a technology conference. Or suppose that I sell copies to a few friends to see if they like it. Or I publish an article on distance-learning systems in which I provide details concerning the microphone. As you might imagine, such situations are common. In cases like this, have I shot myself in the foot? In other words, have I forfeited my ability to obtain a patent? Or will the law allow me a grace period, prior to my application, in which I can publicly disclose my invention in one of these ways?

The various countries in the world take a wide variety of positions on such matters. Some do not recognize any grace period whatsoever. These are known as absolute-novelty jurisdictions. No excuses.

In countries that do recognize grace periods, the scope of those periods differ radically. Here are some examples.

Although some European countries recognize grace periods, they tend to be extremely narrow. In France, for example, the period is only 6 months, and it only covers activities by third parties that involve “evident abuse” (like stealing the information from me) or displays by the inventor at official international exhibitions.

The German rule is similarly very narrow.

Latin American countries, by contrast, tend to be much more forgiving. In Argentina, for example, the grace period is one year, and pretty much any kind of disclosure by the inventor during that period is forgiven.

Much the same is true in Chile

And Brazil

Comparable generosity can be found in the Philippines

And Kenya.

South Africa’s stance is quite different. There, revelations by the inventor prior to the filing date are privileged only if they occur in conjunction with “working” (meaning practicing) the invention in South Africa (not elsewhere in the world) and for the purpose of trial or experiment.

India’s position is similar, but does not limit the trials to those conducted in India.

Japan [pause] and Korea are more like Argentina, Chile and Brazil in the breadth of their grace periods – one year in duration; and open-ended in the types of disclosures that are excused.

China, by contrast, is more like France and Germany – only 6 months, and sharp limitations on the types of disclosures that are permitted.

One other type of disclosure excused under the Chinese rule was only added in 2021. This was designed to permit disclosures related to fighting the COVID pandemic without forfeiting patent protection.

The grace period employed in the United States is the most complex of all. Some of the complexity arises out of the fact that there are two different systems of rules – one applicable to patents based in applications filed before March of 2013, the other for subsequent applications. The intricacies of this system are explored in the next segment of this recorded lecture. But, because the US approach has been rejected by all other countries in the world, you are likely not to find it worth your while. So, to repeat, that portion of the lecture is optional.

What explains this extraordinary diversity? The most plausible explanation is that it reflects differences in the weights assigned by lawmakers in the various countries to what might be called secondary policies. These are lesser in importance than the overarching reward theory that, as I've suggested, drives the novelty doctrine as a whole. But they are not trivial. Here are some examples:

Lawmakers in some countries are swayed by considerations of fairness – for example, ensuring that hardworking inventors are appropriately compensated for their efforts.

Others, especially in European jurisdictions, believe that indulging such impulses leads to uncertainty and unpredictability.

The leaders of European jurisdictions tend to prefer interpretations of novelty that will maximize augmentation of publicly available technical knowledge.

In some jurisdictions, lawmakers are sensitive to the high cost of obtaining patents – and want to give individual inventors – and small and medium-sized enterprises -- some time to assess the commercial viability of their creations before incurring such costs.

Lawmakers in other countries recognize that doing so in effect increases the amount of time in which inventors are shielded from competition, which they regard as socially undesirable.

Last but not least, some groups of lawmakers are more attuned than others to national economic and social interests – in other words, to incentivizing activities that will redound to the benefit of the residents of their own country.

During the seminars that accompany this lecture, you will likely take up the relative merits of these alternative approaches.

B. Inventive Step

This is the second of two parts of the PatentX lecture on Newness. The lecture as a whole examines the aspects of patent law that limit the availability of patents to inventions that are significantly new. In the first part of the lecture, I sketched the rules pertaining to the doctrines of novelty. In this part I will examine the rules governing how much of a contribution an invention must make to the body of knowledge to be patentable.

In the US, the doctrine I'll be examining is called nonobviousness. In most jurisdictions, it's called the inventive step requirement. These two variants are sometimes described collectively as the "invention" requirement.

I'm going to approach this topic from a comparative historical perspective. As you will see, the United States was the pioneer in this field; it led the way in developing the modern invention requirement. The approaches adopted subsequently by all major patent systems are similar to the US approach, but not identical. To the extent they diverge, some of the newer approaches, in particular, the mode of analysis used by the European Patent Office, are commonly considered better than the US model.

OK, let's begin.

Patent Law has its roots in the practices, used by many European monarchs and national governments in the 14th through 17th centuries, of granting, on an ad hoc basis, monopoly privileges to favored petitioners. Sometimes such grants were simple expressions of favoritism – conferring valuable privileges upon the monarch's allies or supporters. But sometimes they reflected a judgment that the recipient of the grant had developed – or had introduced into the relevant country – a socially beneficial invention, and should be rewarded with protection against competition when running a business based on that invention. Issuance of such monopoly privileges was controversial, and monarchs were sometimes compelled to limit the practice. But it persisted.

Typically, grants of the latter sort reflected a judgment by the monarch concerning the importance of the innovation at issue. Thus, one can discern in this practice a rudimentary sense that a monopoly privilege was only appropriate when the relevant innovation reflected a significant inventive step forward. But there was certainly no formal requirement of nonobviousness.

The first statute establishing a patent system was adopted by the Venetian Republic in 1474. An English translation appears on your screen. In the underlined passage – specifically in the reference to "ingenious" in addition to "new," you can again see hints of an inventive-step requirement, but only hints.

As John Duffy has shown, in the mid-16th century, when the relevant aspects of the Venetian system were imported into the grant-making practices of English monarchs, the nascent inventive-step requirement was dropped. Nor was an inventive step requirement included in the 1623 Statute of Monopolies, which curtailed the power of English monarchs to grant special privileges but preserved that authority with respect to “new Manufactures.”

In short, in early English patent practice, novelty was required, but not an inventive step. In the early 19th century, a few English judges and treatise writers began to argue for a more demanding standard. But such efforts generally failed. Until the 1880s, the most that seemed to be required for a patent to pass muster is that its technical contribution be more than “trivial.”

No other European country set the bar higher. Indeed, in France, an inventive-step requirement was not adopted until well into the 20th century.

The lead in establishing an inventive step requirement was taken by courts in the United States. Patent law in the United States originates in a 1790 statute, amended as we’ve seen a year later. Although the first contains a hint of a nonobviousness requirement, the second does not. However, courts in the US soon set about creating one. One of the which they phrased this idea was that a patent is only issued for a “discovery” and a “discovery” in turn requires more than just a “change of form or proportion.” Judicial expressions of this general sort culminated in the 1851 decision by the Supreme Court in the Hotchkiss case.

Patents should not be awarded, the Court there ruled, for “creations that are “destitute of ingenuity or invention”. To be patentable, an invention must require “more ingenuity and skill” than that held by “an ordinary mechanic acquainted with the business”.

Applying this standard, the Court ruled that a doorknob made of clay or porcelain (rather than wood or metal) failed to qualify.

Unfortunately, for the next century, substantial uncertainty remained concerning exactly how this principle should be interpreted and applied. Very roughly speaking, one can say that the courts became increasingly demanding. One decision by the Supreme Court in 1941 went so far as to suggest that, to merit a patent, an invention had to show a “flash of creative genius.” But not all courts when assessing challenges to individual patent claims seemed so demanding.

In 1952, as part of a comprehensive reform of the patent system, Congress sought to clarify the standard – and arguably to lower the bar – by adding a new provision to the statute: section 103.

Here’s the language, which hasn’t changed since. The odd last sentence was intended to neutralize the implicit message of the Supreme Court’s ruling in *Cuno*: that the idea had to come to the inventor in a “flash” – loosely analogous to the light bulb appearing over the inventor’s head.

Unfortunately, 103 did not do as much to resolve the confusion as the reformers had hoped. Thirteen years later, the Supreme Court took a group of cases in hopes of adding greater clarity. In its decision in *Graham*, the Court offered a general framework for applying section 103. It's heart is set forth on your screen.

“Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.”

Yet again, the clarity proved illusory. In the wake of *Graham* the various federal courts of appeals continued to diverge radically in their interpretations of 103 – as revealed by differences in the percentages of patents challenged as obvious that they upheld.

The 2nd circuit was the most demanding – upholding only 4.8%. The 8th circuit was almost as harsh, upholding only 6%. The 1st, 3rd, 7th, 9th, and 10th circuits each upheld about 19%. And the 4th and 5th circuits upheld around 40%. Variation this extreme has obvious disadvantages.

Unhappiness concerning the divergence among the courts of appeals in the interpretation of the nonobviousness standard was one of the major driving forces behind the creation in 1982 of the Federal Circuit. As you know from the first lecture in this series, that court now has exclusive jurisdiction in the US of appeals in all cases that hinge on patent law. The expectation of the supporters of the new court was that, not only would it harmonize the nonobviousness standard throughout the United States, but that the standard it created would be more forgiving than the median position of the existing courts of appeals.

They were right. Starting in 1982, the requirement of nonobviousness has indeed been construed more leniently. In part, the Federal Circuit achieved this through express modifications of the test. In part, it did so by relying more heavily on what the Supreme Court in *Graham* had referred to as “secondary considerations,” which usually tilted in a patentee’s favor. And in part the softening of standard resulted from the fact that the judges on the court generally took a less jaundiced view of the patent system as a whole than either the judges on the other courts of appeals or than the justices on the Supreme Court.

A representative decision by the Federal Circuit was issued in 1999 in the *Al-Site* case. The Court there summarized the nonobviousness standard as follows:

“In a challenge based on obviousness ..., the person alleging invalidity must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention. The ‘presumption of validity under 35 U.S.C. § 282 carries with it a presumption that the Examiner did his duty and knew what claims he was allowing.’ Therefore, the challenger's ‘burden is especially difficult when

the prior art was before the PTO examiner during prosecution of the application.’ The party seeking patent invalidity based on obviousness must also show some motivation or suggestion to combine the prior art teachings. A suggestion or motivation to combine generally arises in the references themselves, but may also be inferred from the nature of the problem or occasionally from the knowledge of those of ordinary skill in the art.”

The penultimate sentence in this passage encapsulates what, by then, had come to be called the TSM test. Those initials refer to the requirement that a challenger identify some “teaching, suggestion, or motivation” that would have prompted a PHOSITA to combine separate components of the prior art to create the invention at issue.

This idea had been around for quite a while. But, during the first 25 years of the Federal Circuit’s interpretations of section 103, it gradually became more prominent and rigid – in other words, it became a true requirement that every challenger must meet, rather than a factor to be considered along with others in assessing nonobviousness.

In 2007, the Supreme Court once again ventured into this field.

In the KSR case, the Court modified the nonobviousness standard in the following five ways:

The most dramatic of the five was to demote TSM from a requirement to a factor. In other words, the presence of a teaching, suggestion, or motivation to put together disparate elements was declared by the Court to be relevant, but not necessarily essential to demonstrate that an invention was obvious.

Second, for some time the Federal Circuit had refused to conclude that an invention was obvious merely because, prior to the invention, it had been “obvious to try” the particular combination of elements that ultimately proved successful. The Supreme Court argued that a circumstance of this sort should be given some weight in the analysis. Here’s the key passage in the opinion:

“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103.”

Third, the Court expressed general skepticism concerning so-called combination patents – in other words, patents on inventions which have no new elements but which instead involve arguably innovative combinations of familiar elements. In one ominous passage, the Court said, ““The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”

Fourth, the Court adjusted slightly the way in which the familiar hypothetical figure of the PHOSITA should be characterized. Said the Court: “The ... error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. ... Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.”

Finally, the lower courts had long warned about the danger posed by hindsight bias when assessing the degree of creativity required to make an innovation. Hindsight bias refers to the tendency of all people to exaggerate the probability that a particular event that occurred in the past could have been predicted in advance. This phenomenon has been observed by psychologists in many contexts. Both experts and jurors in medical malpractice cases, for example, commonly overestimate the predictability of the injury sustained by the plaintiff. Plainly, this bias will increase the likelihood that inventions will be deemed, after the fact, to have been obvious.

In *KSR*, the Supreme Court acknowledged this hazard, but argued that it should not be overstated. “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning. ... Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.”

The cumulative effect of these five dimensions of the Court’s ruling was to raise the bar of nonobviousness significantly – but also, arguably, to diminish the predictability of applications of the doctrine.

Finally, one dimension of the America Invents Act has had the effect – perhaps unintended – of raising the bar one notch higher still. Specifically, the statute shifted the date after which prior art is not considered in determining obviousness from the date of the invention to the date the patent application is filed. The latter will sometimes be later than the former – and thus the set of prior art that endangers the patent will be larger and the likelihood that the invention will, in retrospect, be deemed obvious will go up. Not often or a lot, but a bit.

Thus far, I’ve been describing these adjustments in the height of the nonobviousness requirement by highlighting changes in the language used by the courts when describing the standard. The question naturally arises: did these adjustments make any difference in practice? Specifically, did they affect the likelihood that patents would survive scrutiny at any or all of the points on which, as we have seen, they are subject to challenge?

There have been several efforts by scholars to answer that question empirically. The fruits of their studies are not identical, but line up reasonably well. All of these numbers I’m about to summarize for you are approximations, because I have distilled them from several studies, and because not all of the samples on which those studies are based are comprehensive.

These, I hope you will recall, were the principal loci of patent fights prior to the 2011 America Invents Act.

Before the 2007 KSR decision, if the examiner, after all of the back and forth, rejected an application as obvious, and the applicant appealed to the Federal Circuit (rather than going to the District Court), the applicant prevailed only roughly 20% of the time.

If, by contrast, the examiner allowed the application, the patent issued, and subsequently was challenged on obviousness grounds in litigation, District courts found in favor of the patentee on this issue roughly 80% of the time.

When rulings on obviousness by District Courts were appealed (by one party or the other) to the Federal Circuit, patentees prevailed on this issue roughly 55% of the time.

Now, you should not necessarily infer from these numbers that the Federal Circuit was harsher to patentees by District Courts, because only a subset of the district courts' rulings were appealed. These numbers are important, rather, because they provide a baseline for assessing changes over time.

In the five years after the KSR decision, the likelihood that the rejection of an application by the Patent Office would be overturned by the Federal Circuit dropped from roughly 20% to roughly 5%. That's consistent with the generalization that KSR raised the bar significantly.

In the same period, the likelihood that a patentee would be successful in defeating a obviousness challenge when asserted in infringement litigation in a district court also dropped – from roughly 80% to roughly 60%.

And the likelihood of success on appeal dropped from roughly 55% to roughly 45%.

Since implementation of the AIA, things have gotten more complicated, because now putative infringers have an additional attractive venue in which to challenge patents on nonobviousness grounds – namely, inter partes review before the PTO.

In this latest period, the rate of success in the Federal Circuit when appealing rejections of patent applications seems to have risen slightly

– but that may well be because fewer rejected applicants have appealed.

Now, you might ask, how frequently are applicants forced to go this far because, not only has the examiner turned them aside, but the PTAB has done so as well. In other words, how often does the PTAB side with the examiner, rather than the applicant?

I haven't been able to locate any studies that determine that number for the earlier periods, but for the most recent periods,

it seems to be roughly 60% of the time. In other words, applicants whose applications are rejected as obvious by examiners are able to get the rejection overturned by the PTAB roughly 40% of the time. Restated: a bit less than half of frustrated applicants are able to get the PTAB to overturn the examiner's decision. But if the PTAB sides against them, their odds of success in the Federal Circuit are poor.

Interestingly, the success rate before the PTAB is lower when it's asked to assess nonobviousness in inter partes review than when asked to overturn an examiner's rejection. In other words, if the way a dispute gets to the PTAB is that the examiner allows the application, the patent issues, and either before or, more likely, after the initiation of infringement litigation, a competitor challenges the patent in inter partes review, the patentee prevails only roughly 20% of the time. That number seems to be going up, but it's still eye-opening.

What about the success rate here – i.e., when patents are challenged as obvious in the course of infringement litigation in the district courts? This does not seem to have declined significantly. Between KSR and the AIA, it was roughly 60%, and it remains there.

By contrast, the rate of success at the appellate level seems to have improved – from roughly 45% to roughly 55% -- a shift that is hard to explain on the basis of any change in the formal legal standard.

The upshot is that the AIA arguably has made life significantly more dangerous for patentees, not by altering the standard that the courts use, but by creating this alternative way of asserting obviousness. It's therefore not surprising that patentees' ire is focused on the inter partes review.

So that's a summary of the way in which the nonobviousness standard has evolved to date in the US. Now let's examine some other jurisdictions.

In England, agitation by a few judges and commentators for a more demanding standard began, as it did in the US, in the 19th century. But English legal culture is more conservative than that of the US, so the process by which the law rotated in their direction took longer.

The big jump came in the 1880s. As Professor Duffy has shown, in an 1882 decision by the Court of Appeal and in an 1883 decision by the House of Lords, one can find reasonably clear expressions of an inventive-step requirement. The capstone was the 1889 decision by the House of Lords in *Thomson v. American Braided Wire*, which concerned a patent on a woman's bustle made from braided wire. Lord Hershell's statement of the standard that should be used to resolve the case proved influential: Was the particular design "so obvious as to occur to everyone contemplating the use of braided wire for the purpose of a bustle."

Within a few years, the new approach was firmly established, exemplified by Herschell's statement in another case that the issue was "whether this mode of dealing with forgings . . . was so obvious that it would at once occur to anyone acquainted with the subject, and desirous of accomplishing the end, or whether it required some invention to devise it."

Eventually, in 1932, this approach was codified in an English statute, but it was the courts that had led the way.

When creating the new inventive-step requirements, the English courts were plainly influenced by the evolution of the law in the US. But the English judges never raised the bar as high as did the US courts. The idea that an invention had to reflect a flash of genius never appears in English law. Thus, England was spared the tumult and controversy associated with first the lowering of the bar, and then re-raising it in the US.

In Germany, by contrast, the analogous doctrinal evolution did generate in the mid-20th century some very demanding variants of the inventive step requirement.

Eventually, the divergence among European jurisdictions was much reduced by the overall process of harmonization and by the influence of the European Patent Convention.

The relevant provision of the EPC is fairly bland – and does not seem significant different from the US formulation: "An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art."

However, the manner in which the EPO has interpreted and applied this provision has given it more structure. The EPO's approach is generally known as the "problem-solution" approach. Here's the relevant regulation.

The EPO itself has provided some additional guidance concerning each of the three steps. Here's the relevant portion of the guidance for step 1.

Step 2

And step 3

In addition, a great deal of case law has grown up around this approach. The result, in the judgment of many commentators, has been to render the EPO approach more stable and predictable.

But some unresolved puzzles concerning the application of this methodology remain. Many involve step 1: identification of "the most promising starting point for a development leading to the invention." When the invention at issue consists of an improvement of an existing

device or process, then this is not difficult. But when the invention does not lie along a single, obvious path, it becomes harder.

Martin Muller recently offered the following analogy: Think of the invention at issue as “the summit of a mountain, the prior art a number of base camps and the skilled person a mountaineer faced with the problem of reaching the summit without climbing (ie, without ‘inventive step’). In this situation it may happen that from a very close base camp, the summit cannot be reached because it requires climbing the ‘deadly north face’, whereas from a different base camp, a longer path leads to the summit without the need to climb. The summit thus is reachable without climbing (the invention is obvious) but not from the ‘closest’ base camp.” Which of the alternative base camps should be deemed the closest prior art?

If you are curious – or confused – by this analogy. I’ll show on the screen the relevant portion of the blog post upon which Muller was relying.

Let’s turn, finally, to China. The relevant history in China is much shorter: China did not adopt a patent system until 1984. Right from the beginning, that system incorporated an inventive-step requirement – indeed a very stringent one. The stringency is not apparent from the relevant statutory provision, which is reasonably conventional. Rather, as Ada Yue Wang has shown, it’s revealed by the accompanying Examination Guidelines, which examiners must obey and which Chinese courts conventionally obey. As you can see, the original Guidelines set the bar very high. Indeed, this language resembles the language used by the US Supreme Court in *Cuno*.

Since then, however, the guidelines have been revised three times – and each time, the standard has become more forgiving – in other words, it has become easier for inventors to satisfy.

Here’s the pertinent portion of the 1993 guidelines, the 2001 guidelines, and the 2006 guidelines.

Two aspects of the Chinese story should be emphasized. First, China seems to have adopted the same problem-solution approach used by the EPO. Second, the manner in which that approach has been interpreted and applied in China has become steadily more forgiving.

Why? Well two forces seem to be at work. The first is ideological. The long-standing skepticism with which the leaders of China have regarded all forms of intellectual property has been diminishing. The second is economic. China rapidly became a center of innovation, rather than a copier of innovations made elsewhere. As such, China’s interest in protecting innovators against competition has increased sharply. Returning to our chart, the rapid evolution of the inventive step requirement in China might be depicted as follows.

This trend is one among many sources of the extraordinarily rapid increase in the numbers of patents granted in China.

Returning to the US and focusing now on the present day, how typically is nonobviousness assessed?

The heart of the analysis remains the juxtaposition of three factors:

First, ascertain the scope and content of the prior art. Nowadays, the same requirements concerning chronology and degree of publicity that are used to assess novelty under section 102 are used when determining what pieces of prior art count under section 103.

But not all bits of knowledge that fit the chronological and publicity restrictions will be considered. Only bits that fall into zones that are “analogous” to the claimed invention – i.e., the same field of technology or a field that’s reasonably pertinent to the problem addressed by the invention.

Then there are a few specific statutory exclusions, most of which are aimed at ensuring that collaborators on a project do not injure each other.

Next assess the size of the gap between the prior art and the invention as claimed.

Next ascertain the level of skill possessed by ordinary workers in the field of technology in question. This will require answering such questions as: How educated are they typically? How rapid is the pace of technology in the field? How hard is the science and how good at it are most of the practitioners?

Then put these pieces together by asking: would the invention, as claimed, have been obvious to people of this sort?

In borderline cases, you can supplement your answer by considering the so-called secondary factors. These generally consist of kinds of circumstantial evidence that cast light on how much of a breakthrough the invention truly represented. Those types of evidence are:

Was the invention a commercial success? If so, it suggests that the invention was nonobvious, because otherwise someone else would have recognized the combination of technological opportunity and commercial potential and would have exploited it. Note, however, that this inference arises only if the success of the product embodying the invention is traceable, not just to the invention (and not to marketing and so forth) but even more specifically to the aspect of the invention that purports to reflect an inventive step.

How long had a need for an innovation of this type been recognized in the field?

Had others tried and failed to fill that need?

Were the fruits of the inventor’s research unexpected?

Did experts in the field express skepticism about the inventor's line of research before it proved successful?

Did people in the field praise it afterwards as a breakthrough?

Did competitors copy it or seek licenses for the right to use it?

Did other people come up with the same invention independently soon afterwards?

Finally, some of the factors that I mentioned in my review of KSR remain relevant to nonobviousness determinations. They include:

--Whether there existed in the prior art any teaching, suggestion, or motivation to combine known components or steps

--Whether the research path that resulted in the invention was obvious to try

--Or conversely did the prior art "teach away" In other words, did the prior art contain indications that the research path should not be pursued.

Remember, however, that these questions, which I've labelled ancillary, nowadays are factors to be considered, not absolute requirements. In other words, they are relevant, but not decisive one way or the other.

So, to summarize, with respect to the inventive step requirement, the US was the pioneer. In sharp contrast to the US approach to novelty, which was repudiated by the rest of the world and eventually abandoned by the US itself, the US approach to the inventive step eventually won the day.

Over the past 150 years, there has been a great deal of convergence on this issue. However, significant differences in the ways in which various countries approach the issue remain.

A natural question is: Which of the surviving approaches is best? The dominant response is that, on three dimensions, the EPO approach, the gist of which apparently has been adopted in China, is superior.

- (1) More structured and thus more predictable. The problem-solution format channels analysis somewhat more than the more open-ended US approach in the wake of KSR.
- (2) Surveys by users consistently indicate that they consider patents from the EPO to be of "higher quality."
- (3) At least some observers think that the EPO's approach aligns better with how scientists think and work – at least in highly innovative and complex fields like biotechnology. For example, Jacob Sherkow argues that the divergent way in which the EPO and USPTO responded to the longstanding struggle over CRISPR patents reflected that difference.

On a fourth dimension, however, the answer is less clear: Which approach better advances the fundamental purposes of the patent system as a whole?

Finally, some observers think that the question itself is misleading. There is no such thing as the best approach. Rather, each country should shape its interpretation of the inventive-step requirement in the way that most effectively advances its own social and economic needs and interests. What that might entail will become more apparent when we consider how countries might adjust their laws to address the ongoing health crisis.