AC 2007-1756: HOW TO TEACH PATENT LAW TO ENGINEERS

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How to teach Patent Law to Engineers

The Patent Law Myth

Typical inventors and entrepreneurs have two compelling questions related to patent law: whether their invention is patentable, and whether making and selling their invention infringes upon a competitor's patent. There is, unfortunately, a prevalent myth that combines and confuses these two questions.

> Myth: "As long as I receive a patent on my product, no other company can stop me from making and selling my product."

The truth is that the patentability of an invention, and the right to sell and make the invention without infringement of another patent, are completely unrelated. By misunderstanding this concept, engineers may eventually lose patent rights or infringe the patent rights of a competitor. More importantly, engineers may fail to gain adequate funding for their technology and may consequently fail to introduce, sell, and make an impact with their technology.

Attempts to Educate Engineers

Patent law courses are offered to engineering students at many of the top engineering schools, including:

- Massachusetts Institute of Technology (6.901: Inventions and Patents)[1],
- Stanford University (ME208: Patent Law and Strategy)[2],
- University of Illinois at Urbana-Champaign (GE 401: Patent Law and Related Topics)[3],
- University of Michigan (ME509: Patents, Trademarks, Copyrights)[4], and
- Princeton University (ENG453: Patent Law and Innovation Policy)[5].

I have taught two of these courses, the course at Stanford University and the course at the University of Michigan. While the ability and efforts of the students were very similar, my assessment of the student's performance from the two courses was very different.

As an Adjunct Lecturer for the University of Michigan, I taught ME509: Patents, Trademarks, and Copyrights to engineering students at the graduate and senior undergraduate level during the Winter 2003 and 2004 terms. After inheriting the ME509 course from a previous faculty member, I modified the syllabus to reflect how I had learned patent law in law school. I incorporated the Socratic Method and taught from a law school casebook[6]. The class included lively debates over the intricacies and nuances of the law, such as the *Festo* rule[7] (the exception to the exception to the exception to the rule of infringement). One of my main goals for the course was to teach engineers how to determine whether their invention is patentable and whether making and selling their invention infringes upon a competitor's patent. Despite the solid attendance by the students and my detailed explanation, some of my students still confused the patentability and infringement tests on the exam. Some of the students applied the infringement test to a patentability situation, and some applied the patentability test to an

infringement situation. Despite the fact that enrollment increased from 40+ students to 80+ students over one year, the course – in my mind – had failed.

As a Lecturer for Stanford University, I taught ME208: Patent Law and Strategy for Innovators and Entrepreneurs to engineering students at the graduate and senior undergraduate level during the Fall 2005 and 2006 terms. I developed and introduced the course and, although I kept the Socratic Method, I taught from my own text. The class, which still had lively debates, no longer touched upon the detailed intricacies and nuances of the law, but rather remained at a fairly high, practical level. On the exam, the students demonstrated a clear understanding of the patentability and infringement tests. Coupled with an increase in enrollment from 30+ students to 60+ students, the course was a success.

The Secret to Teaching Patent Law

I developed the Stanford course around four concepts: the necessary background to understand the patentability test and the infringement test, the rules and application of the patentability test, the rules and application of the infringement test, and an exploration of the relationship between the patentability test and the infringement test. An abbreviated version of the syllabus for the Stanford course includes:

1. Introduction to Intellectual Property
2. Overview of the Patent System and Proper Subject Matter
3. Inventorship, Ownership, and Licensing
4. Publication, Public Use, and On-Sale Prohibitions
5. Patentability Test
6. Infringement Test
7. Relationship between the Patentability and Infringement Tests

The secret to teaching patent law is the exploration of the relationship between the patentability test and the infringement test. After the necessary background (including the introduction to intellectual property and the overview of the patent system), the course should spend approximately equal time on the patentability test, the infringement test, and the relationship between the patentability test and the infringement test. With adequate time on the relationship between the two tests, a deeper understanding of the application of the tests develops within the students.

Background for the Patentability and Infringement Tests

Both issued patents and pending applications have two main sections: a technical section and a legal section. The technical section includes drawings and a detailed description of the invention, while the legal section includes one or more claims on the invention.

The technical section of the patent application must enable any person skilled in the art to make and use the invention[8]. For this reason, the technical section typically includes a detailed description of one or more embodiments, or variations, of the invention.

The legal section of the patent application must particularly point out and distinctly state the subject matter of the invention[9]. A patent claim, which is usually in the form of several noun phrases, defines the exact boundary of the scope of legal protection on the invention. It is meant to be both narrow enough to distinguish from previous inventions (known as the "prior art"), and broad enough to cover variations on the invention. Since a claim serves these opposing goals, they are often written in a convoluted, "legalese" style.

Patentability Test

According to patent law, an inventor shall not be entitled to a patent if the invention was previously known or used by others in this country, or patented or described in a printed publication in this or a foreign country[10], or if the differences between the invention and the prior art are such that the invention as a whole would have been obvious to a person having ordinary skill in the art[11]. These two requirements, respectively known as the novelty and unobviousness requirements, are the major aspects of the patentability test.

The patentability test is applied by comparing a legal claim on the invention (either filed in a patent application or written as a hypothetical) to the technical teachings of past inventions (typically found in issued patents or published papers). Simplifying the patentability test, an invention may be patentable if a claim can be written that distinguishes the invention from technical teachings in issued patents (and other published papers).

Infringement Test

According to patent law, whoever without permission from the owner of the patent makes, uses, offers to sell, or sells any patented invention within the United States during the term of the patent infringes the patent[12]. Generally, a patent expires 20 years after the filing date or, in special cases, after the filing date of an earlier related application.

The coverage of a patent is defined by the claims. A patent owner need only prove infringement of a single claim to establish patent infringement of the entire patent. The determination of whether an accused product or method infringes a claim of patent includes interpreting the claim. Once the claims have been properly interpreted, the next step is to compare the interpreted claim with the accused product or method. Simplifying the infringement test, a product or process infringes an existing patent if the product or process includes all of the elements of a claim of the patent.

Relationship between the Patentability and Infringement Tests

As summarized above, an invention may be patentable if claims can be written that distinguish the invention from previous technical teachings in issued patents, while a product may infringe an existing patent if the technical aspects of the product includes all of the elements of a single claim of the patent. As shown and discussed below, there is surprisingly no relationship between the outcomes of the patentability test and the infringement test.

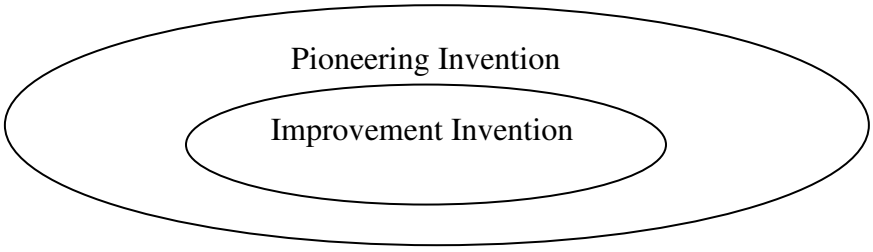
	Infringement	**No Infringement**
Not Patentable	Scenario #1	Scenario #2
Patentable	Scenario #4	Scenario #3

Scenario #1 – Dean Kamen received a patent[13] on a "Personal mobility vehicles and methods", which covers the Segway® personal transporter and, as of the writing of this paper, was still enforceable. An exact replica of the Segway® personal transporter, built and sold without proper authorization, will infringe the patent and will not be patentable.

Scenario #2 – The Wright Brothers received a patent[14] for their "Flying Machine" on 22 May 1906. The patent is long-expired. An exact replica of the Wright Brothers airplane will not infringe the patent and will not be patentable.

Scenario #3 – On the other end of the table, a so-called pioneering invention – such as the Schawlow maser – can be patentable[15] and can avoid infringement of existing patents.

Scenario #4 – A so-called improvement invention may be an improvement of a product covered by a patent. Using one of the above examples, the improvement invention could be a Segway® personal transporter with an enclosure for the occupant. The improvement invention can be simultaneously both patentable and an infringement of the existing patent on the Segway® personal transporter.

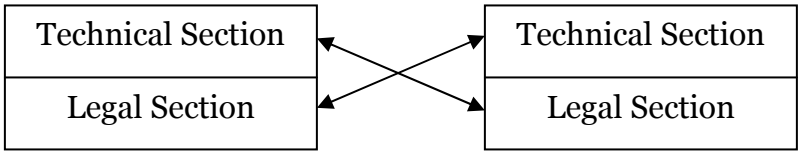


The lack of a relationship between the outcomes of the patentability test and the infringement test is one of the most challenging concepts of patent law and the largest contributor to the previously introduced patent law myth:

> Myth: "As long as I receive a patent on my product, no other company can stop me from making and selling my product."

Although there is no relationship between the language or the outcomes of the patentability test and the language of the infringement test, there are some similarities between the two tests that impede a thorough understanding of the tests and a correct application of the tests.

In the simplest scenario, the patentability test involves a comparison of the legal section on the invention with the technical section of previous patents, while infringement involves a comparison of the technical aspects for a product with the legal section of previous patents.



The failure to convey this "cross-comparison" concept during the ME509 course at the University of Michigan resulted in the incorrect application of the patentability and infringement tests. Many students incorrectly compared the technical aspects of an invention to the technical section of an issued patent, or compared the claims on the invention to the claims of other patents. During the ME208 course at Stanford University, I spent approximately equal time on the patentability test, the infringement test, and the relationship between the patentability test and the infringement test. In short, I successfully conveyed the "cross-comparison" concept during the ME208 course and the students demonstrated a clear understanding of the patentability and infringement tests on the exam.

Conclusion

The incorrect applications of the patentability and infringement tests, which are otherwise straightforward, can lead an engineer into an erroneous determination of the patentability of their invention, or the infringement liability of making and selling their invention. Since these are the two compelling questions of inventors and entrepreneurs, a thorough understanding of the relationship of the patentability and infringement tests must be undertaken. Based on my experience, a patent law course for engineers should spend approximately equal time on the patentability test, the infringement test, and the relationship between the patentability test and the infringement test.

References

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[5] commons.princeton.edu/ciee/2006/10/egr_453_wws_453_patent_law_and_innovation_policy.html
[6] *Intellectual Property in the Technological Age* by Merges, Menell, and Lemley
[7] *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.* (Fed. Cir. 2003)
[8] 35 U.S.C. 112 ¶1.
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[12] 35 U.S.C. 271(a).
[13] U.S. Patent No. 6,651,766
[14] U.S. Patent No. 821,393
[15] U.S. Patent No. 2,929,922