



Patents

During Spring semester I taught a course on optical system design here at Georgia Tech. I had taught the course for many years within an academic quarter. Now I found it was a long slog at the semester distance. The earlier course was based on the last half of my text, *Elements of Modern Optical Design*. One benefit, however, was that the additional five weeks allowed me to add new course materials on optomechanical design and optics in harsh environments and to demonstrate design resources now available on the Web.

Since its inception, the course has included a series of patent reviews by the students. When I designed the course my greatest fear was that the examples that I use in teaching, while illustrative of the concepts I am explaining, might be too “academic.” That is, the examples would be decoupled from the real world, defeating the purpose of the course.

So I set up a series of exercises for the students over the course of the semester. We begin with everyone reviewing the same patent: USP 4,387,300 “Optical Transducer” by Dudash and Hansen, assigned to United Technologies back in 1983. I chose it because it is only seven pages long, but still provides a challenge to students who had never read a patent before. Their review consists of three sections:

1. A description of the patent in their own words and a discussion of the unique features of the patent as asserted by the claimant.
2. A discussion of any physics inherent in the claim and identification of the physical basis for novelty, if it exists.
3. One variation on the design that might result in a new patent.

For the second review, the students can choose from an assortment of patents that I have collected over the years. For the rest of the patents, they pick any optics-based patent that interests them. In the early years they found their patents themselves by going to the Tech library, because it is a US Patent and Trademark Depository Library.

All available patents issued in the U.S. since 1790 are on file there. When I first taught the course, the students had to pick their way through boxes of microfilms and make copies of their patents on thermal printers. But whatever the vicissitudes of the operation, most students, in retrospect, recall it as a valuable exercise after they began to do optics.

The accessibility of patents has changed quite a bit since then. Now, anyone can log on to the Web, open up a browser, and go to the United States Patent and Trademark Office (USPTO) page at www.uspto.gov. There, he or she will find copies of individual patents from 1976 to the present. Patents issued between 1790 and 1976 can only be searched by patent number and current patent classifications, the Patent Office’s numerically coded list of terms. Considering that most of the important stuff has been done since 1976, this is a good place to start. However, there may be patents before 1976 that may contain claims similar to a potential patent, so a Web search does not guarantee that the particular idea is patentable.

With some effort, copies of the patent can be downloaded and printed out. Instructions can be found on the USPTO pages that provide access to the patent database. For PCs there are two free browser plug-ins available for displaying TIFF images; Mac users, like me, have to pay for ours. So it is relatively easy for anyone to evaluate the contents of a patent at their desk. The problem is that if the patent is lengthy, printing it a page at a time can be tedious. The alternative is to use a commercial site.

You will find several of them on the Web. One that grew out of the IBM patent database is www.delphion.com. It started as a demonstration database for IBM computer prowess and morphed into a publicly accessible patent server. A benefit of using this site is that the patents are downloadable in Adobe Acrobat format. The resulting PDF file is easy to read at a number of resolutions and it is easy to print selected pages, with an output quality equal to the original document. One other attraction at Delphion is their Gallery of Obscure Patents, which includes contributions to our technology such as an “Apparatus for simulating a ‘high five’ ” (5,356,330), “Luminescent playing cards” (6,145,838), and a “Braille slot machine” (5,429,507). Also, foreign patents databases can be searched at some of the commercial sites.

At Delphion, the cost of a patent of any size is three dollars. So unless you are one of my students, on a limited budget, the decision to download the patent is a no-brainer. This is particularly true if you are doing this not to satisfy some fussy old professor, but as an aid in the evaluation of patents for income or infringement. The savings in time and trouble may make downloading and searching patents an obligation instead of an option.

But what if you don't need immediate enlightenment on some patent? Suppose you just want to keep up with recent patents and patent applications in your field. You could subscribe to a patent awareness service, but they can be quite pricey. What is probably more valuable and may provide you with a better feedback on current technology is to do your own monthly patent search at the US Patent and Trademark web site. And as of last March 15th, you can search the patent applications, too.

There is enough information on the USPTO site on conducting searches, so that with a little time and a little experimentation you can become adept at individualized searches. To gain a measure of control, I prefer to do advanced searches myself. I can set up a series of search phrases that can select most of the patents of interest to me without being overwhelmed by superfluous finds. For instance, I use field codes in the advanced searches, because they can narrow the field on many patents. A query: "ISD/3/\$/2002" will result in a listing of only the patents issued (ISD=Issue Date) during March 2002. The dollar

sign serves as a wild card character, so all days of that month are selected.

But that query results in 12,765 patents, so a further refinement is necessary. If the terms for diffractive optics are added using: "ISD/3/\$/2002 AND diffractive AND optic\$", the number is reduced to 42 patents. Because there is a tendency in writing many patents to generate laundry lists of possible uses and mechanisms, it is sometimes useful to restrict the search for keywords to the patent abstract. Then the query becomes: "ISD/3/\$/2002 AND ABST/diffractive AND optic\$". In March, only two patents satisfied this criterion. If you keep a list of these queries and survey your area of optical engineering regularly, you will get a feel for what is being patented these days. In addition, exposure to unexpected finds can provoke new ideas and approaches for your current efforts.

With the help of the Internet and the Patent Office, what was once a difficult and onerous task has been made easy and, depending on your temperament, fun. The amount of access and awareness you command becomes a trade-off between your time and your wallet. If you haven't explored this source of information and ideas, you owe it to yourself to do so.

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