

FERMI NATIONAL ACCELERATOR LABORATORY

Exploring the Marketability of Fermilab's Existing Patents

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Abstract

Fermilab has recently set up a new office, the Office of Partnerships and Technology Transfer. The purpose of this office is to establish and promote collaboration as well as engage in technology transfer with industry. Part of the technology transfer process is to promote and license Fermilab's existing patents. This paper describes the method in which three patents were explored and assessed for the purpose of finding potential licensees for them.

Introduction

About a year or so ago, Fermilab introduced a new office under the office of the Chief Operating Officer. This office is the Office of Partnerships and Technology transfer. Technology transfer is the process by which existing knowledge, facilities, or capabilities developed under federal research and development funding are utilized to fulfill private or public needs. The purpose of this newly established office is to establish and maintain collaboration efforts with other organizations, to understand intellectual property issues, prepare assessments of selected potential technology, and to raise technology transfer awareness throughout the laboratory.

This summer I was assigned to work in Fermilab's office of Partnerships and Technology Transfer. As a part of my research, I was able to visit and collaborate with other laboratories to analyze how other Tech Transfer Offices work. Taking the knowledge I learned from the other labs, I applied it to Fermilab's Tech Transfer Office to help increase its efficiency.

As the first summer intern to be assigned to this recently established office my role was to assist in the following:

- Explore the marketability of three of Fermilab's existing patents
- Create a list of potential companies for each patent
- Create two marketing pieces for each patent
- Create a one page fact sheet for each patent

- Create a PowerPoint presentation for each patent
- Assist in requesting copyright from Department of Energy for Fermilab software
- Create a new Invention Disclosure Form

This paper describes the methods by which the tasks stated above were completed. The following are brief summaries of the patents that were researched.

1.) Redundant Single Event Upset Suppression System by James Hoff

Single Event Suppression System (SEUSS) cells are designed to be immune to Single Event Upsets (SEU). CMOS transistors are configured to operate as a SEU-tolerant SR latch. The SEUSS cells come in two different variations. One type of SEUSS cell emulates a cross-coupled NOR gate SR flip-flop (SEUSSNor). The other type emulates a cross-coupled NAND gate SR flip-flop (SEUSSNand). This flexible device when configured as an SEU tolerant SR latch, it can be converted into any known type of latch.

2.) Electromagnetic Boom and Environmental Cleanup Application For Use In Conjunction With Magnetizable Oil by Arden Warner

The spillage of oil onto the environment is an ongoing concern. This method is an alternate way to not only contain oil spills but to recover the oil. The idea is to place ferrite filings on the spilled or unwanted oil. By using a boom apparatus that holds several solenoids, a magnetic field can be induced on the solenoids through the use of an attached power source. Once the magnetic field has been induced, the boom apparatus can be used to pump the oil into a collection chamber.

3.) Systems and Methods For Detecting Nuclear Radiation In the Presence of Backgrounds by Alan D. Bross, Kerry L. Mellott, Anna Pla-Dalmau

This invention is a method and system that can simultaneously detect neutrons, gamma rays, x-rays, and cosmic rays and identify each.

This system incorporates three different types of radiation sensitive scintillators: one type for neutrons, one type for gamma rays, and one type for minimum ionizing particles (a particle which can travel through a medium with a minimum loss of ionization energy).

Methods

Developing Method to Assess Marketability of Technology

Previously, assessing the marketability of Fermilab's patents is a task that has not been done in great detail. In order to gather information on how other laboratories deal with technology transfer my supervisor and I visited Argonne National Laboratory. A licensing agent from Argonne's Technology Development and Commercialization division provided us with different kinds of information that related to my work. I examined the information and sought to find information that would be helpful in developing my own method for assessing the marketability of Fermilab's patents. From all the information I was given I developed my own method for assessing Fermilab's technology. The method that was used to explore the marketability and find potential companies for the three patents is described below in six basic steps.

1. Read and Understand the Patent

Before the technology can be assessed it must first be understood. The best way to start understanding a technology is to read its patent. The patent will offer background information, a description of associated drawings, and a description of how the invention works. There will be certain terminology that will need to be explored through the use of online databases and scientific articles. Once there is a basic understanding of the invention, the next step is to talk to the inventor. The inventor provides valuable insight on how the invention works, what makes it better than existing technology, and some potential applications.

2. Search for Related Patents

Once the basics of the technology are figured out the next task is to search for related patents. Using the United States Trademark and Patent Office website is a great place to search for related patents. The patents that are of more importance are the ones that have been granted recently within the past five or ten years depending on the technology. Searching for related patents helps to analyze if the invention would still be relevant to the market today. It is important to note who the assignees are for the inventions as well. Looking at the assignees of related patents will help with the search for companies with related products.

3. Search for Companies with Related Technology

At this point, there are several clues that lead to finding companies with related technology. Having read the Fermilab patent and related patents, the technology field we are working with is now clear. Having looked at the assignees of related patents leads to several company websites. Once on the website, it is important to learn why the company deals with the technology related to the Fermilab patent. Each company website will lead to products related to the technology. Using online databases, such as Hoover'sTM also assists in searching for and analyzing individual companies and industries. This database is beneficial in creating a list of potential companies for each patent.

4. Identify Potential Products or Services

Based on all of the information that has been learned it is now time to think about how the Fermilab patent will fit into the market. It should be possible at this point to envision what industries this invention would benefit or how it can be used within certain products to make them more efficient.

The next step would be to look analyze the industries into which the products based on this technology will likely be sold. This can be done through the use of online databases, company reports, or recent online business articles. To the extent possible, the markets in financial terms, the geographic description of the market, the market size for the envisioned products, and possibly the growth of the market should be described.

5. Identify the Regulatory Environment

Many products have regulations set on them by the local or federal government. In this step we must describe the possible regulatory environment that products based on this technology may encounter on their way to the marketplace. We are exploring how difficult the regulatory environment surrounding technology is likely to be. This can be done through a variety of ways. It can be done by using a search engine and typing in “regulatory environment”, glancing at scientific articles, and reviewing engineering journals.

6. Identify Government vs. Commercial Interest

This is one of the most vital sections to assessing technology. By now, possible applications for the patent should be realized. The purpose of this section is to investigate if the users of the technology will be US government or non-US government customers. To find potential government customers one should search government agencies that one thinks are relevant to the technology. Taking a look at marketing reports and scientific journals may also drop clues on whether the US government deals with the technology.

Marketing the Technology

After the technology had been assessed it was then time to create two marketing pieces for the patent. Other laboratories that are funded by the Department of Energy have webpages that market their available technology. On the webpage some labs have one page fact sheets that provide a brief description of an available technology they have developed. The brief description provides a short summary of the invention, some of its benefits, and possible applications. These webpages also include links to short presentations that are more in depth. Using Microsoft Word I created these fact sheets and PowerPoint for the presentations. These marketing pieces were created to assist in the promotion of our inventions.

Assisting in Requesting Copyright

Before Fermilab can license any software to industry, it must assert copyright.

Under the Fermilab prime contract, the lab must receive approval from the Department of Energy patent counsel before it can assert copyright. Part of the process to receive approval is to fill out an expanded abstract form for the software, in this case called Histo-Scope. In order to complete this form it was necessary to read the software's README file and also to talk to the creators of the software.

Creation of New Invention Disclosure Form

When an Employee at Fermilab develops an invention through company time, they are required to disclose their invention to the lab. This is formally done by filling out a form called a Record of Invention. The form that has been used uses terminology that some inventors have difficulty understanding. The form includes a guideline but is vague and needs improvement. I went about creating a new one with the help of electrical engineer, Jim Hoff. The new fillable form and accompanying guideline was to be created using Microsoft Word.

Results

During the summer, the following tasks were accomplished:

1. Three different Fermilab Patents Assessed

Three separate marketing assessments were created for each patent explored. The benefits of the invention, related technologies, and potential applications were investigated as parts of the assessments. A list of potential companies was also created for each patent.

2. Marketing Material for Two Patents Developed

By using the information gathered from other laboratories, I developed a PowerPoint presentation and fact sheet for the Oil Boom Invention and SEUSS invention.

I was not able to create marketing pieces for the radiation detection invention because I was not sure about its ability to be licensed and also due to the complexity of the invention.

3. Helped elect copyright for Fermilab software

By successfully requesting approval to assert copyright on the Fermilab software, HistoScope, the Office of Partnerships and Technology Transfer will now be able to continue the licensing process with the interested company.

4. Rough Draft of New Invention Disclosure Form Created

Though the new form is not finished and has not been approved by the Department of Energy, it is a step towards making invention disclosure easier for inventors. This form was developed as a fillable electronic form and comes with a guideline to make disclosure simpler and more efficient than before.

Discussion and Conclusion

The reason that assessing the marketability of each patent is so important is because the overall goal is to transfer this technology to industry. One goal of the Office of Technology Transfer is to license our available technology to companies. The marketing assessment explains possible markets, companies, and applications for each individual invention.

There were a multitude of applications and potential companies that were explored within this project. It was discovered that the SEUSS has major applications in the aerospace industry due to its radiation tolerance. SEUSS can be used within a microelectronic that uses CMOS technology and can also be used in medical imaging devices as well as devices that need high levels of data protection. This invention has low power consumption, is cheaper, and more flexible than other microelectronics that serve the same purpose.

The Oil Boom Apparatus has a specific application: to clean up oil. This invention is also much more efficient than other oil spill cleanup techniques currently used.

Clean up techniques such as oil dispersant may harm the marine environment. Containment booms do not clean up the oil and fail to contain the oil during high tide and heavy wind, and In situ burning converts oil into airborne residues. This invention does not use harmful chemicals of any kind and so will make it less likely to harm marine life as compare to dispersants. This invention is able to be used in any body of water, unlike other oil booms which are designed for specific types of bodies of water. Because the invention makes use of magnetic filings, it is possible for the filings to be reused.

The Nuclear radiation invention is a method that detects neutrons, gamma rays, x-rays, and cosmic rays and identifies each. This method is cheaper compared to other kinds of detection systems such as ones that make use of gaseous or liquid scintillators. This kind of invention has applications in radiation monitoring, x-ray systems, contamination inspection. Both the US government and non-US government customers make use of radiation detection technology.

As a result of having been the first intern to work for the Office of Partnerships and Technology Transfer there are a few things that I do believe can be done to make the office more efficient. First, a more efficient way of assessing the technology should be created. I have merely created a rough draft that needs to be improved upon. Fermilab should also try to invest more money in marketing research. Some of the online databases I used were only available to me through my university. These databases were of great help in looking at different industries and companies that could use our inventions. Our office should also continue raising awareness of what we do. The Tech Transfer Office shows the world that Fermilab is relevant to everyday life. Yes, Fermilab is a physics laboratory that creates apparatuses for its own purpose but those apparatuses may also have other potential applications. It's part of the Tech Transfer Office's responsibility to find those potential applications and promote the technology. The lab should also raise greater awareness of parallel careers and opportunities that the lab has to offer to students with a technical background.

Literature Cited

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