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Intellectual Property Law Reform and Environmental Innovation

***Executive Summary**:* The current structure of intellectual property law in the United States of America does not encourage the kind of innovation required to advance an agenda of environmental benefits. To foster the kinds of environmental innovation needed by today's society, changes to specific areas of patent law application are required. To move from stagnation to scale in a short time frame, the law and associated processes should be changed to lengthen patent terms, shorten patent prosecution time, make patent licensing mandatory, and lower patent standards. These changes will catalyze the flow of money and inventions into areas that will spur innovations with an environmental benefit for society. A

Introduction

How does an environmental protection agenda fit into the broad scope of innovating for profit? What limitations and obstacles to entrepreneurship are in place under the current framework of law in the United States and how might these barriers be removed? These hard questions are begging for new answers as we look to transition from a nation of resource users and abusers to a nation of resource managers. Many key steps in fostering the innovations necessary to bring about lasting change will be taken not by sweeping environmental legislation, but by the actions of consumers in the marketplace. Given the option, all else being equal, most consumers

will now make the choice to buy the environmentally sound product. Given the option, all else being equal, most consumers of resources will choose the process that does the most environmental good, or in any event the least environmental harm. The market is ready for more options to become available; inspiring entrepreneurs and venture capitalists to use their resources and expend their efforts toward this opportunity is the challenge America currently faces. Change agents are aligning behind new ideas in intellectual property and patent law. In this report I will discuss the current framework of intellectual property and patent law in the United States, and the limitations and obstacles faced by our inventors and entrepreneurs because of these laws. The market failures in environmental innovation show us how we can shape the structure of law in the future to provide the desired results. These lessons learned will naturally lead us into a discussion of options available for solving these failures, and how to best alter the legal landscape to accommodate a fix.

Current legal landscape and market failures

United States intellectual property law offers certain opportunities to promote technological innovation that has environmental benefits. Most common proposals for patent law reform, such as a way of streamlining the patent application and acquisition process, cannot be expected or shown to provide a measurable increase in technological innovation with environmental benefit.

Patent validity requirements as currently structured are restrictive to the types of inventions that are eligible for patenting. The four main areas to consider when deciding if a patent may be valid are subject matter, utility, non-obviousness, and novelty.[1] According to the Patent Act, processes, machines, articles of manufacture, and

compositions of matter are patent eligible. The Supreme Court has interpreted this statutory language to cover "Anything under the sun made by man."[2] This means that both products and processes are eligible to be patented. Examples of patent eligible processes would be clean hydro-fracking technology for natural gas recovery, or a new manufacturing process resulting in lower amounts of chemical by-products. A new carbon remediation product is also patent eligible. This subject matter requirement is fairly simple to deal with under today's standards. Utility is another simple idea with respect to environmental innovation. If a product or process has some kind of environmental benefit, it will be deemed to be useful. Novelty means, in general, that "it has not been previously patented, published, or known or used by others."[3] Lastly, an invention must be non-obvious in light of what is already known in order to receive a patent.[4] Small advances over prior technology are not entitled to patent protection. The purpose of the requirement that the process or product is non-obvious is because it does not benefit society enough to deserve a patent monopoly. Society as a whole will gain small advances over time anyway; these advances do not require extra incentives.

Looking at the requirements at face value, it would seem that patent law does not pose a threat to those who would protect their environmental innovations through a patent. It is my assertion that not nearly enough environmental innovation is happening in proportion to the amount of other technological innovations we see on a daily basis. There is much that could and should be developed to provide a societal benefit, but still we wait for the next big thing. Electric cars, wind energy, hybrid technology- all good steps, but not as good as the consumer demands them to be, and not yet able to be implemented on a relevant level nationwide. While there are many ways to address this

problem, patent law seems to show obvious incentives to inventors who have a new and non-obvious environmental technology. So a crucial question arises: Is environmental innovation not properly incentivized or is it true that patent law offers great incentives?

The basic idea behind patent law is that without the protection afforded to the inventor, there would be a lack of innovation in the market. Products would not be incentivized by the promise of market rewards, and in turn those who would invest or produce new and novel products would choose to opt for alternatives upon which to focus their energies. This would then lead to stagnation in society, and rampant theft of intellectual property for reproduction without compensation or shared payment in the cost of development of the invention. Fewer total inventions would be developed, and society would suffer because of it.

Patent law solves this market failure. Inventors gain rewards through royalties and monopoly prices. It allows inventors to charge prices that more closely approach the actual market value that is a direct function of the demand present at that exact moment in society. So we see that patent law has the necessary drive to push inventions into the public realm where they become commercialized for common use and potentially the added secondary or tertiary effects these inventions may have.

Another market failure to consider is the tendency of a company to invest capital in the areas that will allow them to realize revenue in the market that is greater in total than the cost of production. The company will not be driven to invest in environmental innovations if they do not present a solid benefit in return that meets the criteria described above. Due to the fact that the rewards are not always commensurate with

the necessary returns expected to trigger investment, companies do not on their own provide the optimal level of environmental innovation for the greater good of society. Looking back in the process, this lack of financial incentive for businesses means there is less incentive for someone working in environmental innovation to invent, produce, or market their ideas.

Due to the market failures described above, we see that the best levels of technological innovation that give the added benefit to society of having that environmental twist are not inherently incentivized under our current system and laws. To work around the absence of invention and the lack of definite environmental innovation in business, we must look at possible approaches and how they might affect each problem.

Government patent rewards systems

Generally speaking, since intellectual property and patent law somewhat solve the invention problem, I will focus on the issue of trying to stimulate business to find incentive to build more environmental innovation into their product and process planning. One approach that has been proposed in reformatory discussions[5] is a patent rewards system. This may seem viable as a possibility on paper, in practice it will not succeed. Here is why: typical patent rewards systems follow the general outline that an inventor applies for patent protection to the government, as is the case now. However, rather than being granted an exclusive monopoly, the inventor is paid by the government for their intellectual property, and the government then makes the property available to the general public for a fee or for free. Compensation from the government could be based on the inventor's expected profit. One could say that the government is

capable of shifting this idea to encourage environmental innovation by basing the compensation on expected environmental benefit to society. This is a nice thought, but in a society that is driven by the almighty dollar, getting legislation for policy through the approval process that involves the government compensating individuals or corporations based on *expected* future benefits is not only daunting but outright negligent by some standards. The case of the Solyndra Company in Fremont, CA highlights what can happen when big government allocates large sums based on perceived future environmental benefits, only to watch these dollars dissolve into chapter 11 bankruptcy.[6] These kinds of government stimuli can be brought about in other ways that would seem more appropriate, such as university grants, Presidential challenge forums, etc. Ideas and processes that come from business should certainly not be left on a windy corner, but from a realist's point of view, the patent rewards system is quite simply a nut too tough to crack.

Proposed changes to current areas of intellectual property law

Rather than using a system of government controlled rewards, the solutions to the problem of market failures in environmental innovation lie in four main areas that each provide individual possibilities of strengthening the hold that patent law has on the incentives driving more societal benefit. They are modification of patent terms, streamlining patent approval processes, mandatory patent licensing, and lowering patent standards. Each of these areas currently has some effect on incentivization; I will examine the status quo, then discuss the types of changes that may be implemented, as well as why these changes may or may not be optimal.

Under current patent law, the term is limited to twenty years of protection.[7] Some balk at the social engineering aspect of the idea, but it has been suggested that perhaps a good way to incentivize any invention to bring a greater benefit for a particular area of society is to lengthen patent terms for that area. For example, if I invent a new widget that allows cars to gain five additional miles per gallon, I can apply for a patent under the categories of technology, environment, and energy. If granted said patent, it must be for the smallest period of all applied for. So if the government altered patent terms to 22, 25, and 20 years respectively for the above categories, I would be incentivized as an inventor to move my energy toward devising products that can be shown to have environmental benefit to society vice only energy, or, under current law, toward profit alone.

Patents are currently granted via a process called patent prosecution. This starts with an application to the United States Patent and Trademark Office (USPTO). There are several rounds of internal review and possibly appeals before an allowance and issue of the patent.[8] Obtaining the patent usually involves significant investments of time and money. If the complications associated with prosecuting the patent are high, it can take longer and therefore cost more. Many environmental innovation patents fall into this complicated category. A process which, when implemented, would streamline patent prosecution for inventors would lower costs, save time, and therefore encourage innovation that provides societal benefit through secondary and tertiary upsides beyond profit in dollars.

Mandatory patent licensing would be a deviation from current patent law, in that rather than each patent owner having exclusive rights to decide whether to license their

patent, they would be compelled to do so. Additionally, holding the patent license would compel you to market or use the patent for profit. This area is generally one not under consideration in the United States, as it can be considered invasion of property rights.[9] If I have an acre of farmland, the government generally cannot make me grow a crop for the good of society as a whole. This kind of practice is more common in communist governments, such as North Korea. However, we have seen in the past here in the US that this kind of reform can have benefit on a large scale for society. The best example is the case of the batteries used in hybrid electric cars. Battery technology company GM Ovonics (later named Cobasys) designed batteries capable of the kind of reserve power needed for increased vehicle range before recharge. GM shares in the company were purchased by Texaco. Texaco then merged with Chevron, who restructured the battery company and retained rights to license the battery technology. Chevron then effectively tabled the design by making it economically impossible for most companies to utilize the license, and the patent provided no environmental benefit.[10] (The Cobasys company was finally purchased by BASF last year and is now licensing the technology.)[11] So in this case, Chevron would have been compelled to either license the patent or to utilize it for profit in the marketplace.

Finally, the process of lowering patent standards, meaning essentially that the innovation can be less non-obvious. The initial stages of product development are usually seen as a series of steps leading up to the patent application. The difference in lowering the approval standards could be that approval for patent protection would be granted earlier in this process. This may stir business to provide more research and development resources toward environmental innovations. More resources being

directed toward any problem generally garners a change that has potential to gather momentum. This area unfortunately also has the most volatility; if a patent is granted too early, and products are found later to be lacking in usefulness or fail late stage trials, innovation could be stifled.

The sustainability of a process has several key components. In the business sense, profit can be described not only in dollars, but in the added elements of people, planet and profit, sometimes called the triple bottom line. The incentives driving innovations that provide environmental benefit are currently insufficient to bring about the level of change society requires moving forward, and the speed with which this change is needed. The specific adjustments to patent law in the areas of mandatory licensing, term modifications, streamlined approvals, and lowered standards discussed earlier are needed to push inventors to shift their focus toward the triple bottom line; not away from the dollar profit but alongside it. If these changes are made; lengthening patent terms, shortening patent prosecution time, making patent licensing mandatory, and lowering patent standards, then the environmental innovations society demands now will be incentivized and brought to market effectively.

[1] textbook

[2] Diamond v. Diehr (1981). Laws of nature, physical phenomena, and abstract ideas are not patent-eligible. Gottschal k v. Benson (1972)

[3] 35 U.S.C. §102

[4] 35 U.S.C. §103(a) (2005): "A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have

been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains."

[5] http://www.temple.edu/law/tjstel/2005/spring/v24no1-Mandel

[6] http://www.solyndra.com/2011/09/solyndra-suspends-operations-to-evaluate-reorganization-options/, http://en.wikipedia.org/wiki/Solyndra

[7] 35 U.S.C. § 154

[8] 35 U.S.C. § 111(a)(1), http://www.temple.edu/law/tjstel/2005/spring/v24no1-Mandel

[9] Hartford-Empire Co. v. United States (1945)

[10] http://en.wikipedia.org/wiki/Patent_encumbrance_of_large_automotive_NiMH_batteries

[11] http://www.basf.com/group/corporate/us/en/news-and-media-relations/news-releases/news-releases-usa/P-12-037