Legal Backgrounder

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U.S. PATENT REFORM AND THE FUTURE OF NANOTECHNOLOGY

by

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The year 2005 could be remembered as the year with the most significant changes to United States patent law since 1952, which featured the Patent Act of 1952. The new proposals would substantially change the practice of patent law in all technology areas. Consequently, industry groups' lobbying of Congress has been intense. In particular, the pharmaceutical and software industries are at odds over many of the changes because of their potential impact on their respective technologies. However, the impact that such changes could have on the nanotechnology industry cannot be generalized due to the inherent diversity of the nanotechnology business. This LEGAL BACKGROUNDER addresses the proposed changes and how nanotech companies may be impacted.

The Patent Act of 2005. The United States Senate Judiciary Committee began 2005 by creating a new subcommittee to specifically handle intellectual property issues. Senator Orrin G. Hatch (R- Utah), the subcommittee's chairman stated: "I have an aggressive agenda for this subcommittee, starting with comprehensive patent reform. We need strong patent protection to give incentives for innovation and economic growth."

In April 2005, the United States House of Representatives' Judiciary Committee's Subcommittee on Courts, the Internet, and Intellectual Property began the process of trying to reach a consensus on new legislation by floating an initial proposal called a "Committee Print" of the "Patent Act of 2005."

Multiple House and Senate hearings followed the introduction of the committee print. Testimony was heard on behalf of many organizations, industry groups, companies, and individual inventors including the Intellectual Property Owners Association (IPO), Business Software Alliance, Financial Services Roundtable, American Bar Association (ABA), American Intellectual Property Law Association (AIPLA), the U.S Patent and Trademark Office (USPTO), National Research Council of the National Academy of Sciences (NRC-NAS), Genentech, Eli Lilly, Intel, Micron Technologies, and Intellectual Ventures. However, none of the testimony was specifically on behalf of nanotechnology companies.

On June 8, 2005, H.R. 2795, the "Patent Act of 2005" was officially introduced by Congressman Lamar Smith (R-TX), Chairman of the House Subcommittee on Courts, the Internet, and Intellectual

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Property. Following the introduction of the bill, Congressman Smith spoke at the Conference on Patent Reform at the National Academy of Sciences. The day-long conference allowed speakers from various industry groups to present their views on the bill. Congressman Smith noted that a "delicate balance" was needed to produce a bill acceptable to the interested parties.

***Nanotechnology* — What is it?** Nanotechnology is a nascent multidisciplinary field with ties to diverse industries such as food and semiconductors. In layman's terms, nanotechnology relates to materials and products of nanometer size — extremely small. A nanometer is one billionth of a meter or about the length of 3 to 6 atoms, depending upon the atom.

In October 2004, the United States Patent and Trademark Office took the first step in a multi-step classification process of defining nanotechnology by creating a new "cross-reference digest" for nanotechnology designated Class 977/Dig.1. USPTO, New Cross-Reference Digest for Nanotechnology *available at* http://www/uspto.gov/web/patents/biochempharm/crossref.htm.

Class 977, nanotechnology, provides for disclosures (1) related to research and technology development at the atomic, molecular, or macromolecular levels, in the length of scale of approximately 1-100 nanometer range in at least one dimension; and (2) that provide a fundamental understanding of phenomena and materials at the nanoscale and to create and use structures, devices, and systems that have novel properties and functions because of their small and/or intermediate size.

Nanotechnology Organizations. Organizations involved in nanotechnology range from large companies with many non-nanotech products, e.g., IBM, Hewlett Packard, Lucent Technologies' Bell Labs Innovations to small start-ups whose primary emphasis is on nanotechnology, e.g., Nanosys, Nano-Tex and Quantom Dot, to universities and governments. These organizations generally have rather different business strategies concerning their nanotechnology products. These include, for example: 1) the "technology enabler," a strategy found in organizations that primarily provide nanotechnology to others (e.g., Nanosys); 2) the "application provider," a strategy present in companies that primarily produce a product or service based on nanotechnology (e.g., Nanotex); 3) the "technology adaptor," a strategy found in companies that primarily adopt nanotechnology from others to enhance products (e.g., Levi Dockers); and 4) the "intellectual capital builder," a strategy generally applicable to universities that develop fundamental nanotechnology for intellectual stimulation.

Given the great variety in types of nanotechnology organizations and their diverse business strategies, it is not surprising that the nanotechnology industry lacks a united front when addressing patent reform issues. However, some general themes are present. For example, most organizations support patent reform which would improve patent quality, and reduce litigation costs. These two goals are exactly what the Patent Reform Act of 2005 attempts to achieve.

At the June 9, 2005 Conference on Patent Reform, Doug Jamison, President and COO, of Harris & Harris Group, Inc. (a publicly traded nanotechnology venture capitol company) summarized many viewpoints regarding patent reform, including the general notion that patent reform should "reduce the uncertainty of IP" and allow individuals to "focus time on building business."

Three Subjective Elements of Litigation. The National Research Council's 2004 report entitled "A Patent System for the 21st Century" identified three subjective elements of patent litigation that increase the cost and decrease the predictability of patent infringement litigation: best mode, willful infringement, and inequitable conduct. These issues are unique to the U.S. patent jurisprudence and depend on the assessment of a party's state of mind at the time of the alleged infringement or the time of the patent application. The Patent Act of 2005 seeks to either eliminate these elements or substantially modify them.

Best Mode. The Patent Act of 2005 would eliminate the requirement in 35 U.S.C. § 112 for an application to "set forth the best mode contemplated by the inventor of carrying out his invention." Only the U.S. imposes this requirement on inventors. Its goal is to motivate more extensive disclosure to the public. Given the subjective nature of determining the best mode, litigation over this issue can be expensive and time-consuming. The NRC reasoned that "given the cost and inefficiency of this defense, its limited

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contribution to the inventor's motivation to disclose beyond that already provided by the enablement provisions of Section 112, its dependence on a system of pretrial discovery, and its inconsistencies with European and Japanese patent laws, the committee recommends that the best-mode requirement be eliminated." *A Patent System for the 21st Century*, The National Academies Press, Washington D.C., 2004, at 117-123.

Interestingly enough, this is not the view of some smaller start-ups in the nanotech field. It is quite likely that it would be unnecessary for an inventor to include the best mode in a nanotechnology invention to satisfy the enablement requirement. Thus, in certain situations, inventors would be able to obtain patent protection for their inventions and yet keep the best mode secret — effectively extending indefinitely their monopoly over their best mode as long as it is kept a trade secret.

The United States patent system was set up with a *quid pro quo* in mind — the inventor receives patent exclusivity in exchange for the full disclosure of the invention to the public for later use. Thus, maintaining a trade secret on the best mode (e.g., implementation "tricks") contradicts the current incentive system.

Willful Infringement. The Patent Act of 2005 would substantially reduce the circumstances under which willful infringement might be found. When a party is put on actual or constructive notice of a valid U.S. patent, continued infringement of the patent can result in the trebling of damages.[1] The current willful infringement standard causes some companies to instruct employees not to read publicly available third party patents for fear of being found to have willfully infringed the patent. Thus, most organizations favorably view the changes to the willful infringement standard to promote dissemination of information and to advance creative thought.

Inequitable Conduct. Contrastingly, there is considerable debate about how to reduce charges of inequitable conduct. The defense of inequitable conduct arises when the patent applicant has made a material misstatement or omission with intent to deceive the PTO. While both materiality of the information and intent to deceive must be proved, the court will consider all of the circumstances and balance the level of materiality and intent. For example, in a case when substantially material information has been withheld, a court may rule that inequitable conduct occurred by implying the requisite intent element. Inequitable conduct is often pleaded in patent cases and also substantially impacts the cost of litigation.

The Patent Act of 2005 would transfer determinations of inequitable conduct to the USPTO. While many companies support decreasing litigation costs, many wonder whether such a transfer of jurisdiction achieves this goal. Moreover, the USPTO may not have the resources and investigatory procedures to properly develop evidence to competently rule on these issues.

Pre-Grant Submissions and Post-Grant Opposition. One of the driving forces behind patent reform is improvement of patent quality. Poor patents may induce unwarranted investment in product development. The USPTO is often accused of not producing quality patents. It has been estimated that examiners spend a mere 8 to 25 hours per patent application from start to finish. Http://www.ftc.gov/os/2003/10/innovationrpt.pdf. It is thought that allowing competitors to interact with the patenting process would improve the quality of issued patents. The debate has been over when, where, and how competitors should be allowed to participate.

The Patent Act of 2005 would allow third parties to participate in patent prosecution before and after issuance of the patent. Submissions of prior art publications by third parties would be allowed within a specified time frame during prosecution of the application. The submission would require a concise description of the asserted relevance of each submitted document.

However, such submissions could be problematic to small startup companies — nanotechnology-based or otherwise — who rely on quick issuance of patents to raise capitol. Conversely, it can also be

[1]Actual notice requires the patent owner to make an allegation of infringement against a third party, while constructive notice only requires knowledge of the patent by a third party.

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argued that a pre-grant submission process could benefit startups because any patent that has withstood the pre-grant submission would be a patent of higher quality.

Similarly, post-grant opposition procedures have supporters and opponents at both large and small companies. A post-grant opposition system would allow third parties to oppose a patent following its issuance. Some feel that post-grant oppositions would be used to harass patent owners. Accordingly, many are calling for a very limited time period during which post-grant oppositions could be filed. The Patent Act of 2005 would allow for the filing of an opposition request no later than nine months after the grant of the patent. However, the Act also contains a "second window" of opportunity to oppose the patent, which is no later than six months after receiving notice from a patent holder alleging infringement. This second window is supported by larger companies who want an alternative to expensive litigation; however, it is strongly opposed by smaller companies who want investors to feel confident that their patents will not be easily attacked.

First Inventor to File. After decades of debate, the governing law may soon be that inventors who are first to file an application at the USPTO are entitled to the patent. Inventorship in the United States is based on a first-to-invent system. If two individuals invent the same invention, whoever was first is theoretically entitled to a patent. However, determining who was the first to invent is very complex and expensive. The United States is the only country in the world that uses a first to invent analysis — all other countries base inventorship on a first-inventor-to-file system.

This change may strain less-funded small entities such as university tech-transfer offices. Such organizations must carefully balance new patent filing numbers with investment opportunities and researcher availability. They may not have sufficient funds to file all invention submissions in a timely manner, thus, further jeopardizing their efforts to attract both new sponsors and quality researchers.

For years, individual inventors fought to keep the first-to-invent system. However, it has become clear that the first-to-invent system may actually not be in an individual inventor's best interest — primarily due to the excessive costs of interferences — the legal mechanism for determining the "first" inventor. For the individual inventor, there is significant comfort in knowing they were the first to file.

Injunctive Relief. The nanotechnology industry as a whole is significantly divided on the issue of injunctive relief into the "haves" and the "have nots." Those companies who "have" dominating patents want to exclude others from producing similar products. Those companies producing products that generally are not covered by patents — the "have nots" — want to make improved products using patented technology without paying substantial royalties.

Currently, if a patent owner sues an alleged infringer and the infringer is found by a district court to have infringed the patent owner's patent, the court will automatically issue an injunction requiring the infringer to immediately stop selling the infringing product. In the electronics field, this is a problem for manufacturers of products composed of many components. For example, computer manufactures may have to pull the computers from store shelves if they are found to have infringed one small component.

The Patent Act of 2005 has a more subjective standard, which would have equity play a larger role in determining whether injunctive relief should be granted: "In determining equity, the court shall consider the fairness of the remedy in light of all the facts and the relevant interests of the parties associated with the invention." Additionally, in determining damages, the Patent Act of 2005 states: "In determining a reasonable royalty in the case of a combination, the court shall consider, if relevant and among other factors, the portion of the realizable profit that should be credited to the inventive contribution as distinguished from other features of the combination, the manufacturing process, business risks, or significant features, or improvements added by the infringer."

The Future. The future is bright for nanotechnology. The effects that patent reform will have on nanotech companies will differ significantly depending upon the size and business strategy of the company. However, ultimately, it is difficult to argue that patent reform seeking to improve patent quality and decrease litigation costs should not be enacted.

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