Nanotechnology: Covert Brand Protection

J. Steven Rutt, Ph.D., J.D.

Foley & Lardner, L.L.P.
Washington, DC 20007-5101
srutt@foleylaw.com

ABSTRACT

Nanotechnology has become an important covert technology for combating counterfeiting and protecting brands. Sophisticated combinations of both covert and overt technologies are needed to combat these evils. Counterfeiting problems are particularly acute in the pharmaceutical industry, where lives are destroyed by counterfeiting. New proprietary nanotechnologies are flowing from a variety of sources including, for example, NanoInk, National Physical Laboratory (UK), Oxonica, as well as multi-national companies. Legal considerations are also critical to stopping the problem, and law firms such as Foley & Lardner, L.L.P. are stepping up efforts to educate the public, train professionals, and combat the problem. For example, intellectual property is important to the commercialization of the nanotechnology including patents, trade secrets, and trademarks.

Keywords: nanotechnology, brand protection, anti-counterfeiting, nanolithography, patent.

1 INTRODUCTION: THE BRAND PROTECTION NEED

Foley & Lardner recently sponsored a conference "Battling Global Piracy and Counterfeiting," at which leading corporations and organizations set forth the needs. [1] At this conference, all players agreed that the counterfeiting problem cannot be ignored, particularly in areas where human health is concerned. For example, the World Health Organization estimates that 10% of global medicines are fake. Internet drug sales compound the problem, and pharmaceutical companies face increasing liability exposure related to counterfeiting. Moreover, organized crime has become involved in counterfeiting at an international level, and dank prospects of terrorism also lurk. Indeed, counterfeiting is a growing, global problem affecting every industry from basketball to soda to pharmaceuticals. [2]

However, on the bright side, counterfeiting can be increasingly fought with advanced technology including nanotechnology. In addition to the need to stop counterfeiting, a need exists to use advanced nanotechnology to prevent diversion of products intended for a particular market (grey market diversion). Supply chains must be better managed. Both brand protection owners in the private sector and also governments increasingly need to strike out against those that reduce the value of their brand and take away profits and are turning to nanotechnology for answers. The trick, however, is to find complex, platform nanotechnology which cannot be duplicated but yet also can be used inexpensively in a variety of applications ranging from medicines to spare parts to luxury items. It must be easy to use for the brand owner but difficult to use for the counterfeiter. Counterfeiting and diversion also introduce complex international considerations, particularly with respect to China. [2] Hence, anti-counterfeiting strategy must be global. China, as one of the primary global sources of counterfeit drugs, has begun taking steps to address the issue, particularly since its accession to the World Trade Organization in 2001. The World Health Organization has said that in 2003 alone China's State Drug Administration closed 1,300 illegal factories and investigated cases of counterfeit drugs worth $57 million.

In this paper, a review of the needs, nanotechnology solutions, the players, and intellectual property strategy will be presented. Reviews in the field include (i) "Role of Nanotechnology in Brand Protection" by Rebecca Roberts, March 28, 2006 (http://profitthroughinnovation.com/content/view/80/), and (ii) a recent market report from Pira Intl. (Dexter Johnson), "The Future of Nanotechnology In Printing and Packaging."

Foley & Lardner, L.L.P. is a leading law firm in the area of nanotechnology and brand protection (www.foley.com; www.nanotechnologylaw.com). [1]

2 NANOINK

New technology solutions to growing problems invite venture capital-backed start-up companies. One example is the leading nanotechnology company, NanoInk (Skokie, IL, www.nanoink.net).

NanoInk commercially exploits proprietary nanolithography and, in particular, its DPN® printing. In this process, nanoscale pattern formation can be achieved by delivery of inks from nanoscale tips to surfaces under conditions which favor the formation of high resolution, stable structures (Figure 1). This technology was originally licensed from Northwestern University, and came from the nanotechnology laboratory of Professor Chad Mirkin, and additional technology licenses have been secured from University of Illinois, Stanford University, and the Georgia Institute of Technology. See, e.g., US Patent Nos. 6,827,979; 6,867,443; and 7,060,977. NanoInk now owns an extensive patent estate, as well as a variety of important, supplementary trade secrets and know-how. In addition to its Nanoencryption™ technology for brand protection, NanoInk's other commercial applications to date include bioarrays and photomask repair.

While NanoInk can exploit the technology in many different brand protection applications, the pharmaceutical brand protection is the immediate focus. Once pills have been marked, they need authenticated. NanoInk plans to establish at least six auditing centers around the world. Authentication testing is done quickly (within 24-48 hours) in a completely non-destructive manner, providing evidence. NanoInk is the only company that provides a true forensic level track and trace brand protection at the unit level. Moreover, the technology is designed around trusted manufacturing technology familiar to pharmaceutical companies.

3 OXONICA/NANOPLEX

In 2006, confirming the commercial promise for nanotechnology in brand protection, leading nanotechnology company Oxonica bought NanoPlex. NanoPlex had been commercializing proprietary colloidal rod particles as nanobar codes (see for example US Patent Nos 6,919,009 and 7,045,049). The product is supplied as a powder and can be added to liquid or surface coatings. The company has developed the nano bar-code particles to be used primarily as a covert tag for anti-counterfeiting applications. But purportedly the technology also has the ability to give each item or pallet, depending on how the company opts to apply it, a unique identity code allowing it to track where the product has been. Every item purportedly can be assigned a different code because the system allows for billions of unique codes.

The nanoparticles are made up of metals, including gold, silver, and platinum, which creates stripes using the different reflectivity of the metals. Oxonica can create different codes by altering the stripe order. The bar codes can only be read with a modified microscope and are likely to be used as a last-level taggant, which is read at a central location and known only by a few members of the company. The nano bar codes are complimentary to RFID and competes on cost with the other taggant technologies available (see Rebecca Roberts, "The Role of Nanotechnology in Brand Protection").

4 NATIONAL PHYSICAL LABORATORY

In NPL's patent-pending technology (see US Patent Publication 2006/0196945), a preferred embodiment provides a 3D nanometer scale data encryption key. The technology involves using 3D polymer patterns on silicon substrates as evolved, tri-dimensional barcodes. It provides several possible degrees of encryption which, together with the high technology involved, makes it in principle at least virtually impossible to counterfeit. The patent application describes the basic geometry, the process, the coding principles through such structures, and the reading principles. The preferred geometry is that of an array of lines, similar to a barcode when seen from above, with the difference that lines have dimensions in the tens of nanometer range. These lines are preferably made of a cross-linked, modified Poly(methyl methacrylate). Cross-linking by ultra-violet light gives them an exceptional mechanical durability for structures of this size.

5 OTHER ORGANIZATIONS

Another crucial aspect to nanotechnology commercialization in brand protection is alliances and standard formation. For example, on January 10, 2007, eighteen companies including NanoInk and large companies such as 3M and DuPont launched the International Authentication Alliance (IAA). In addition, in 2005, eight companies joined together to form The Brand Protection Alliance (BPA) and additional companies have since joined.

Another organization stems from the US Chamber of Commerce: Coalition Against Counterfeiting and Piracy (CACP) (see, www.thetruecost.org). Still further, another organization is North American Security Products Organization (NASPO).

Government also plays an important role. For example, the FDA continues to promote anticounterfeiting efforts, but has focused on RFID technology to date. RFID, however, suffers from significant problems including lack of security and lack of unit protection, and RFID has not been widely accepted and adopted to date by the industry.

6 ROLE OF PATENTS

The importance of patents can be seen in Document Security System's massive litigation against the European Central Bank over anti-counterfeiting technology. Allegedly, every euro banknote in circulation infringes its anti-counterfeiting patent. The technology stops the notes from being forged by digital scanners. Although the technology is not per se nanotechnology, the litigation provides lessons for those commercializing nanotechnology in anticounterfeiting.

Briefly, patents provide the patent owner with a powerful monopoly: the right to exclude others from using the patented technology. The patent owner, however, must disclose the technology in the patent, and of course wily counterfeiters can read patent literature. Moreover, criminal counterfeiters may not be susceptible to classic patent infringement litigation. Hence, trade secrets may complement the patent protection, and a sophisticated intellectual property strategy must be developed to balance patenting and trade secrets. For example, patent filings in the US must comply with the "best mode" requirement which means that companies must be careful in holding back trade secret information from the patent filing.

We have measured an increase in anti-counterfeiting patent filings. See Figure 2. We expect this trend to continue. The PTO needs to monitor sectors of the economy which experience increases in patent filings and adjust and train their examining cores accordingly. Foley & Lardner, L.L.P. actively dialogs with the US PTO on its examination efforts including nanotechnology patent examinations and currently proposed patent reforms. [5]

7 ROLE OF TRADE SECRETS

Trade secrets are an important component to nanotechnology brand protection. Because sophisticated counterfeiters can read patent applications, and learn the technology therein, the technology can be also protected by trade secret routes to complement patent efforts. However, trade secrets generally receive less protection outside the US, require extensive management, and are a relatively more difficult basis for attracting investment. Hence, the relative pros and cons of patents versus trade secrets must be carefully balanced. One must assume, however, that counterfeiters can and will read patent literature. Hence, the trade secret option must be seriously considered in this industry.

8 ROLE OF TRADEMARKS AND BRANDING

Supplementing the technology protection offered by patents and trade secrets, trademarks and service marks are important in developing branding and advertising strategies. The marks can protect goods or services (i.e., trademarks versus service marks). While many companies prefer to adopt trademarks which are descriptive of the good or service being protected, stronger trademark protection ultimately arises when the trademark is a "arbitrary" or "fanciful" with respect to the underlying good or service. Companies must carefully enforce their trademarks to prevent generic use of the mark. Moreover, registration of the trademark offers many rights which are not available if the mark is left unregistered. While trademark protection may seem like a difficult expense for an emerging high technology start-up company, the value of the mark will become clear as the technology "takes off" in the market place, and imitators and competitors arise.

9 CONCLUSIONS

Counterfeiting strikes at the heart of modern economies, threatening lives and commercial trust. Nanotechnology provides some answers to this problem. Sophisticated, integrated legal strategies are needed to maximize the potential of nanotechnology to solve this difficult problem.

REFERENCES

[1] "Battling Global Piracy and Counterfeiting" Conference held by Foley & Lardner LLP Monday, September 25, 2006, New York, NY.

[2] Eban, Katherine. *Dangerous Doses: How Counterfeiters are Contaminating America's Drug Supply.* New York: Harcourt, 2005.

[3] Mertha, Andrew. *The Politics of Piracy: Intellectual Property in Contemporary China.* United States: Cornell University Press, 2005.

[4] Based on searching US patent abstracts for "counterfeit$" OR "anticounterfeit$" at www.uspto.gov. The search revealed 499 U.S. patents and 333 U.S. patent publications as of November 14, 2006.

[5] For example, Foley & Lardner LLP has sponsored for the past five years the IBF Nanotech Investment Forum which features the PTO's lead nanotechnology spokesman, Bruce Kisliuk. Foley also actively helps lead and participates in the US PTO's nanotechnology customer partnership meetings. Foley also works closely with the Nanotechnology Business Alliance on its government policy efforts including patent policy.

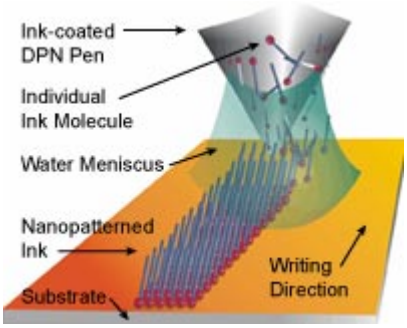

Figure 1 (used with permission of NanoInk, Inc.)

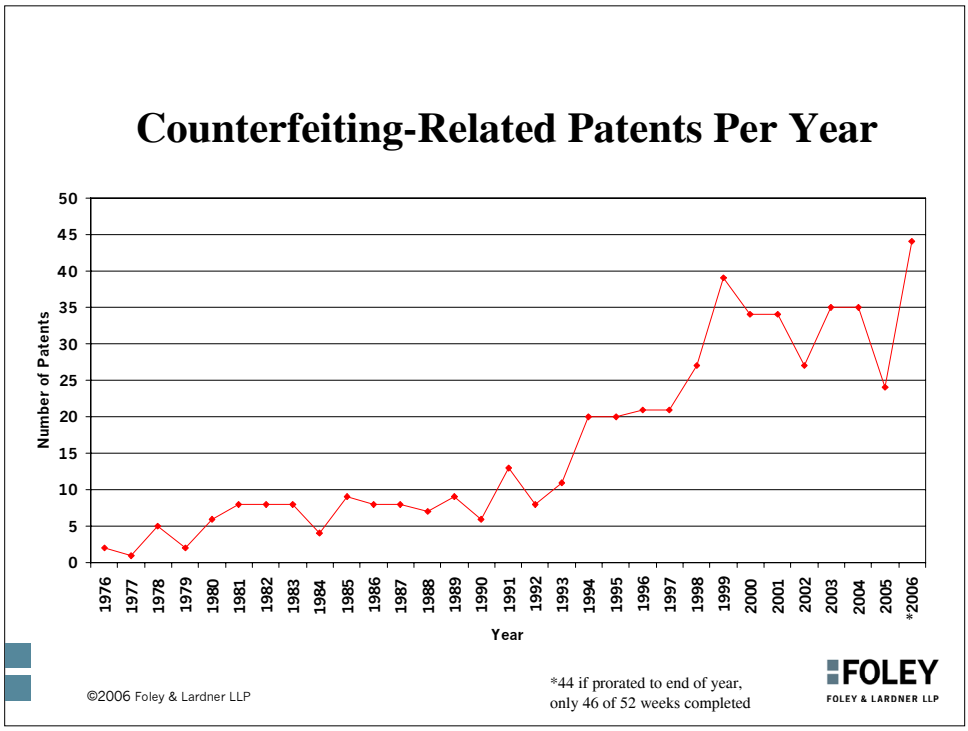

Figure 2: Illustrates how U.S. patenting of anti-counterfeiting technology has dramatically increased (almost ten-fold) in the past thirty years. [4] For example, only 16 patents issued from 1976-1980, whereas 38 patents issued in 1986-1990, and 155 patents issued in 2001-2005. 2006 has the highest number of patents, and over three hundred U.S. patent filings have published since 2001 which indicates many more patents will be issuing in the next five years.