IP Panel: Protection for Nanotechnology Innovations

Don Featherstone
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A View of Commercialization Through Patent Activity

CREATE

- Employment Agreement
- Non-disclosure Agreement
- Joint Development Agreement
- License Agreement

Scope of Claims?
Festo Impact?
Is Small Patentable?

PROTECT

- Keep as Trade Secret?
- File Provisional?
- File Non-provisional?
- File Internationally?
- Is Invention Enabled?

TECHNOLOGY TRANSFER

Field of Use?
Ownership?
Bayh-Dole Impact?

COMMERCIALIZATION

- Patent Grant
- Patent Prosecution
- Draft Patent Application
- Strategic IP Counseling
- Idea Conception

GO TO MARKET

- Monetize non-core inventions?
- Freedom to Operate?
Topics

- Patent vs. Trade Secret Protection
- Trends for Patent Filings and by Patent Offices
- Statistics of Patent Filings
- Insights and Nuances
1. Trade Secrets vs. Patents

- Patent law protects original ideas:
  - “Anything under the sun made by man” that has practical application
  - Must be new, useful and non-obvious

- Patents require disclosure

- Publication kills trade secrets
Definition of Trade Secret

“Trade secrets” protects confidential information that:

– Derives independent economic value,

and

– Is kept secret
Duty to Maintain Secrecy

- Hallmark of protection is secrecy
- Secrecy need not be absolute
  - owner may, without losing protection, disclose it to a licensee, an employee, or a stranger, if the disclosure is made in confidence, express or implied
- No “use” requirement: potential economic value sufficient
- Novelty not necessary
What’s Not a Trade Secret?

• Generally not trade secrets:
  – Common knowledge
  – Readily ascertainable ideas
  – Trivial advances in known formulas or processes
  – Publicly available information

• Caveats:
  – Mere fact that device or formula is susceptible of being reproduced, through material effort, does not negate trade secret status
  – Mere presence of all elements of an idea in the technical literature does not *per se* destroy trade secret status
    • Secret can be in combination of otherwise well-known principles
How Protection is Lost

• Discovery by independent invention
• Reverse engineering
  – Acquiring a product by proper means and determining how it was produced does not constitute a trade secret misappropriation
  – Anything **not** protected by patent or copyright
• Publishing
Violation by “Misappropriation”

- **Acquisition** by someone who knows or has reason to know secret acquired by improper means, or by
- **Disclosure** or use of a trade secret of another without express or implied consent
State and Federal Trade Secret Protection

- States laws recognize trade secrets
- Federal legislation modeled after the Uniform Trade Secrets Act (UTSA) and Economic Espionage 18 U.S.C. § 1831 and theft of trade secrets § 1832
“Know-How” vs. “Trade Secrets”

• Definition of “know-how”
  – “the informational and experiential expertise related to practical application of specifics, such as patented or unpatented inventions, formulas or processes” Milgrim on Trade Secrets §1.09[3].
  • Broader concept that encompasses trade secrets

• Know-how can sometimes be a trade secret
  – Must be more than simply knowledge and skill
  – A reasonable degree of precision and specificity is required
Trade Secrets vs. Patents – “Best Mode”

- Best mode requirement
  - Requires patent application to include “best mode contemplated by the inventor of carrying out his invention.”
  - Inherent conflict between trade secret and patent

- But trade secrets and patents not mutually exclusive
  - Best mode contemplated by inventors
  - Keys off the “claimed” invention at “time of filing”
    - Improvements in practicing invention developed by others in company can be kept as trade secret
  - At time of filing
    - Improvements developed after filing can be kept as trade secrets
    - No ongoing duty to update best mode
Nano: Disruptive or Enabling Technology?

HARRIS & HARRIS GROUP INC
as of 11-Jan-2006

21st Century Nano R&D Act

Nanosys files S1

Nanosys withdraws S1

Copyright 2005 Yahoo! Inc.
http://finance.yahoo.com/
Nanotech IP Landscape – Now?
In Practice

• Enabling?
  – It’s hard to maintain TS when sharing know how
  – Contract law vs. patent licensing

• Can TS be reverse engineered?
  – Yes: consider patenting
  – No: consider TS, if
    • Customers don’t need know how, and
    • Adequate TS safeguards are in place
2. Patent Filings and Office Trends

• Poll of attorneys practicing globally:
  – China (PRC)
  – Europe
  – Japan
  – South Korea
  – Singapore
  – Taiwan
  – United States
Subject Matter and Classification

- No *per se* statutory subject matter limitations
  - “Any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”

- US has only detailed NT specific classification (977)

- EPO tracks NT filings with special tags (Y01N)
  - >100k in database
  - B81 is Micro-structural technology
  - B82 is Nano-structural technology

- Japan created nano-physics category in 2002
  - Nano-optics are categorized as "Expose/Development"
Examination

• Most offices employ measures to ensure that nanotechnology applications are handled by examiners with the right experience in the specific field

• KIPO – International Patent Classifications (IPC's) are assigned to teams within the Convergence Technology Center

• Criteria for evaluating patentability of nanotechnology applications are the same criteria as other technologies: novelty, inventive step, industrial application
Reduction to Practice

- Generally, proof of reduction to practice not needed
- But, enabling disclosure must be provided upon filing (i.e., no new matter)
- Working examples can become critical
- E.g., in EPO, if description is prima face insufficient examiner can request for evidence that the invention was put into practice
- In US, working examples helpful to overcome prior art of a more general nature
Claiming

- Careful not to claim *too* broadly
- File claims of varying scope
- Target potential infringers by envisioning future licensing fields of use
- Does smaller make it patentable?
Obviousness of Ranges

• In US practice, minimization alone is not enough to impart patentability
• Unexpected results are critical
• Presumption that prior art is enabled (See MPEP 2144.05)
  – *In re Aller* 220 F.2d 454 (CCPA 1955)
    • "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

• But is it?
  – Does the art teach “wanting” to achieve XYZ?
  – Does the art teach “how” to achieve it?

- US Cross Reference Class 977 Stats
  - Just over 6000 issued patents to date
  - Just under 6000 published applications to date
  - Other US Stats
  - US Gov’t Funding in Nanotechnology

- EPO: B81 is Micro-structural technology whereas B82 is Nano-structural technology

- Singapore Patents issued by IPC

- Nanotechnology Published Patent Applications by top 15 Countries
U.S. Patents Classified in Class 977

U.S. Patents Granted/Published in Nanotechnology

Year

Patents Published

Patents Granted
Other US Stats

• Nanotech Patents: Distribution Across Technologies
  – Electrical (TC 2800): 44%
  – Chem/Materials (TC 1700): 29%
  – Biotech/Pharma (TC1600): 16%
  – Mechanical (TC 3700): 6%

• Nanotech Patents and Pre-grant Publications Distribution By Type of Invention
  – Manufacture, Treatment, Or Detection Of Nanostructure: 39%
  – Nanostructure: 33%
  – Specified Use Of Nanostructure: 27%
  – Mathematical Algorithms, E.G., Specifically Adapted For Modeling Configurations Or Properties Of Nanostructure: <1%
  – Miscellaneous: <1%
## Institutions with the Most US Filings

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# US Gov’t Funding in Nanotechnology

## U.S. Federal Government Funding for Nanotechnology Research

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## U.S. Nanotechnology Research by Agency 2007-2010 (in millions)

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EPO Statistics for Filings in Classes B81-B82

B81 is Micro-structural technology whereas B82 is Nano-structural technology
A: Human Necessities
B: Performing Operations, Transporting
C: Chemistry, Metallurgy
D: Textiles, Paper
E: Fixed Constructions
F: Mechanical Engineering, Lighting, Heating, Weapons
G: Physics
H: Electricity
The top 15 countries/regions’ Patent Offices from 1975 to May, 2008.*

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Applications Shared Across the Top 15 Countries
4. Insights and Nuances

- Extensive nanotech patenting will continue for at least several years (integration, nano-macro interfaces, manufacturing methods)
- Weak patent positions may be strengthened, assuming a need for bedrock foundation (VCs will demand it, and large companies understand it)
- Companies will continue to strengthen commercialization position through licensing (university and company-company) and M&A
- Patent litigation will mark the start of serious commercialization or vice versa
- This may one day slow the rate of nano innovation, due to the time and expense of litigation
Thank You
Mass. Definition of “Trade Secret”

• Mass. Gen. Laws ch.93 §42 provides a cause of action for misappropriation of trade secrets
  – Actual damages can be doubled by court

• Definition of Trade Secret
  – “anything tangible or intangible or electronically kept or stored, which constitutes, represents, evidences or records secret scientific, technical, merchandising, production or management information, design, process, procedure, formula, invention or improvement.” Mass. Gen. Laws ch. 266, § 30
Definition of “Trade Secret” (cont’d)

- Factors most often considered by Mass. courts in determining if particular information constitutes a “trade secret”
  1. The extent to which the information is known outside the plaintiff’s business
  2. The extent to which it is known by employees and others involved in the plaintiff’s business
  3. The extent of measures taken by the plaintiff to guard the secrecy of the information
  4. The value of the information to the plaintiff and to its competitors
  5. The amount of effort or money expended by the plaintiff in developing the information
  6. The ease or difficulty with which the information could be properly acquired or duplicated by others

Trade Secret Best Practices

• Trade secret owner must take *reasonable measures* to protect secrecy
  – Absence of sufficient precautions will forfeit secrecy
  – Must be reasonable *under the circumstances*
  – Determination of reasonableness must consider the *size* and other characteristics of owner and the *cost* of the safeguards employed versus those that could have been employed.

• Key point:
  – Evidence of intensive and extensive efforts to maintain information as a secret may be probative that the information itself is a trade secret
  – But elaborate secrecy measures cannot elevate public knowledge to the status of a trade secret
Trade Secret Best Practices

- Practices courts focus on to preserve secrecy:
  - Techniques used to give notice of trade secret status to employees and other confidential disclosees:
    - Confidentiality provisions in employment agreements
    - Use of nondisclosure agreements
    - Posting of warning or cautionary signs or using document legends
    - Restricting employee and visitor access to information on need to know basis
    - Maintaining internal secrecy by dividing process into steps and separating employees/departments working on steps
    - Using unnamed or coded ingredients
    - Keeping secret substances and documents under lock
    - Limiting access to computer materials by use of passwords
    - Including trade secret policy in company manuals