Patent Law & Nanotechnology: An Examiner’s Perspective

Eric Woods
MiRC Technical Staff
eric.woods@mirc.gatech.edu
Presentation Overview

• What is a Patent?
• Parts and Form of a Patent application
• Standards for Evaluating Applications
• Writing Disclosures
• Identifying Patentable Subject Matter: Searching and 37 CFR §1.56 et seq
• Protecting IP: Parts and Forms
What is a patent?

• A government-granted monopoly for a limited time in exchange for public disclosure (e.g. publishing) of an invention
• The right to exclude - the *exclusive* right to *prevent others* from:
  – Making
  – Using
  – Selling or offering for sale
  – Importing”
• “The right to sue”
• Utility patent (vs. plant or design)
What can be patented?

• In the United States: 35 USC §101:
  – “Any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”
• US Supreme Court (‘USSC’) determines scope and has added:
  – Genes and living organisms (GMOs)
  – Computer software and Business methods
  – Surgical methods & methods of treating diseases
• In Europe / Japan / China: the scope of USC 101 but not most or all of the items that USSC has added
What cannot be patented?

• In United States:
  – Physical phenomena (such as electromagnetic signals*)
  – Naturally occurring minerals, plants, or animals
  – Laws of nature (e.g. E=mc²)
  – Abstract ideas (computer software per se*)

• In other countries
  – All of the above, methods that involve mental steps, methods of playing games, etc; it varies by country/WIPO rules
Who can apply for a patent?

• In the United States:
  – The inventors must apply for the patent
  – Inventors can assign rights to a corporation
  – Corporate entities cannot directly apply for a patent

• WIPO / Europe:
  – Corporate entities may directly apply for a patent
  – Inventors only need to be listed
Where to submit an application?

• National offices:
  – United States Patent & Trademark Office (USPTO)

• Regional Offices:
  – European Patent Office (EPO)
  – ARIPO

• World Intellectual Property Organization (WIPO)
  – Patent Cooperation Treaty (PCT)
Are patent applications published?

• Every country publishes the patent application by 18 months after filing

• In the United States, if an application is only going to be domestically, then a special form may be filled out and sent to the USPTO to request that the application not be published
Other types of patent application

- **United States**
  - Provisional: expires after one year, specification only
  - Continuation: child application, same specification, new claims, choice of applicant to file
  - Divisional: child application, same specification, split claims (different inventions), Office forces applicant to drop claims or file separately
  - Continuation-in-Part: child application, but adds new material – effective filing date becomes date of added material (usually has same effective end date)
  - Child applications must be filed before parent case issues

- **International**
  - PCT – global, unified *application* – WIPO does not issue, but these are treated differently once filed in each designated country
Filing dates and priority

• “Foreign priority” - Filing a patent application in one country gives the inventor one year to file the application in another country where it is treated as having been filed on that same date (Paris Convention)

• “Domestic priority” – Filing a continuation, divisional, or CIP - these receive the effective filing date of their parent applications

• PCT applications – after filing, have 18-30 months to file in designated countries and receive foreign priority – when filed as a National Stage application they are treated as US applications
What are the key differences between US and foreign patents?

• Three key ones to remember
  – First-to-file vs. first-to-invent
  – One year grace period in US law does not exist overseas – use it & lose it – publish first-apply later only works in the US
  – Day a paper is published or talk is given is the effective date it is available in other countries
  – Patentable subject matter is more narrow in other countries
What are the parts of a patent application?

- Fee & Oath
- Specification (Written Description)
  - Claims
- Drawing
- 35 USC §111
Foreign filings vs. PCT
Applications – pros and cons

• Direct filing of applications in specific country
  – Advantages: Speed, limit coverage to important country
  – Disadvantages: Translations required immediately, need local / in-country representative immediately

• PCT
  – Advantages: one application, no translations immediately required
  – Disadvantages: Process is slower, no provisional rights, more expensive; still require in-country counsel for each country application as well as PCT-qualified agent
What are the requirements for a written description? (35 USC §112)

• It must explain how to make and/or use the invention
• In full, clear, concise, and exact terms
• In a manner so that a person having ordinary skill in the art (PHOSITA) can implement it
• While including the best mode to carry out the invention
• Ends with **claims** which clearly point out and distinctly claim the desired subject matter
What are the drawing requirements?

• If the invention can be illustrated by a drawing, it should have at least one

• Drawings need to be formal
  – No handwriting
  – No sketches

• Drawings are not ‘formally’ reviewed by a draftsman, but rather by the examiner
What should the specification contain?

• Title and Abstract
• Background of the invention – anything listed here is prior art and will be used as a reference against the claims filed
• Brief summary of the invention
• Brief description of the drawings
• Detailed description of the invention
• Claims
How is the scope of a patent determined?

• “The name of the game is the claim”
• Wording in the claims determines the scope of the patent
• Defining any unique terms or commonly used terms that may need a specific meaning
Which standards does an examiner utilize to evaluate claims?

- 35 USC §101: claims must be patentable subject matter
- 35 USC §112: claims must be fully supported in specification & clearly written
- 35 USC §102: claims must be novel
- 35 USC §103: claim must be non-obvious
What is section 102 novelty?

• Has it been done before?

• Key points:
  – 1. Patented or published patent application
  – 2. Public use or sale, publication or presentation more than a year prior to filing by the inventor (“one year bar” “one year grace period”)
  – 3. Publication by another before the filing date
What is Section 103
Obviousness?

• “Obvious to one of ordinary skill in the art at the time the invention was made”

• Key: examiners are assumed to be at or above the ordinary level of skill in the art

• Key: invention is viewed as of the filing date – only publications, etc, that were available on or before that date may be used

• Prior patents / applications by the same company, unless published one year or more before filing, cannot be used for obviousness determinations
What is section 103 obviousness?

• Graham v. Deere (1966) – 3 factors:
  – Scope and content of the prior art;
  – Differences between the claimed invention and the prior art; and
  – The level of ordinary skill in the prior art
    *Secondary considerations (commercial success; long-felt need; failure of others)

• KSR v. Teleflex (2007)
  – Reaffirmed two key points:
    • Combination or substitution of various elements that produces predictable or similar results is probably obvious
    • PHOSITA may use judgment, common sense, etc, as sources of rationale for obviousness rejection – must still be justified
The Examiner’s Role

• Examiner makes factual and legal determinations concerning patentability

• Examiners work under a quota system with a fixed number of hours per case – less hours at higher pay grades and very short amounts of time for simple art areas (e.g. screws, nails) vs. complex areas (nanotechnology, computer graphics, etc) which get the most time

• The junior examiner works independently but has work reviewed by (supervisory) primary examiners to ensure determinations are valid
Examination Process

• Application is read and checked for general consistency (drawings mentioned in specification, etc)

• Claims are reviewed

• Claims are evaluated for restriction; if necessary, examination stops until applicant elects group of claims
Examination Process

• Restriction practice
  – Different inventions will be split between different applications

• Original or Amended Claims are reviewed for compliance with 35 USC 101, 112, 102, 103
Examiner’s Perspective on Claims

- Very broad claims will be rejected easily
- Claims should be written to be very specific
- Otherwise there will be multiple rounds of amendment – both expensive and time consuming
How does this actually apply?
Great example

• The invention claimed is:

1. An apparatus for detecting a selected material that changes an effective dielectric constant of a circular resonator, the apparatus comprising: an input waveguide being capable of receiving electromagnetic wave; an output waveguide; and a circular resonator located adjacent to the input and output such that the electromagnetic wave is coupled in and out of the circular resonator, the resonator being capable of bonding to the selected material such that the selected material changes the power of the electromagnetic wave in the circular resonator, wherein the output waveguide receives the change in the power of the electromagnetic wave in the circular resonator.

• This patent issued with no amendment from the first action
University Perspective

• IP Licensing driven by Bayh-Dole Act in 1980
• Universities can retain title to federally funded research
• Universities must actively pursue patent and attempt to commercialize research
• University decisions to pursue patents are based on IP disclosures filed by researchers
University Perspective

• University Technology Transfer Office evaluates IP disclosure documents to determine what is further pursued as a patent
• Hard for the Office to evaluate scientific potential
• Evaluate applications based on BOTH business perspective and scientific merit
• Researchers need to make sure to emphasize commercialization and revenue potential in their disclosure documents
USPTO search site

- Image File Wrapper technology
- All items in file wrapper are prior art
- Public Full-image database
- [http://www.uspto.gov/patft](http://www.uspto.gov/patft)
- Public PAIR
How to identify Patentable Subject Matter

• Read through patent documents and published patent applications
• Read through current papers in the field
• When reviewing documents, need to make a note what documents were reviewed
• Compare current project with published material
Researcher’s Perspective

- Need to identify patentable subject matter
- Desire to protect invention
- Decision on how to proceed:
  - Trade secret
  - Patent
Searching for Patentable Subject Matter

- Patents and applications use totally different language than scientific literature
- Key to patent scope is the claimed invention
- Wording can be very different
- Need to review large numbers of patents or find another researcher or searcher that has experience to find out *key terms* in the patent literature
- Key importance is finding someone with experience in this field
Process after Identifying Potential Patentable Subject Matter

• Review the literature

• Write the disclosure document
  – Summarize invention first
  – Make it read well like a story of how the technology evolved
  – Do not include too much background information
Review of Nanotechnology-specific patent / IP issues

- Crowded field – carbon nanotubes
- Patent thicket
- Specific examples
Conclusions

• What is a patent
• The parts of a patent
• US vs. foreign filing
• Decisions driving filing patents
• Identifying Patentable Subject Matter
• Nano-technology specific items