Introduction to Patents and Their Applications

Boston College Office of Technology Transfer and Licensing
What is a Patent?

A legal right to **exclude** others from making, using, selling, or importing the technology in the country of issuance
Sanctioned monopoly for a limited time
Does not give the inventor the right to make, use or sell the patented invention – the invention might fall under a broader patent owned by others
Patent claims are the legal definition of an inventor’s protectable invention
Important Points

A patent permits the owner to prohibit someone from using the invention without a “license”

Having a patent doesn't necessarily allow the patent owner the right to use the invention because the use of any invention may infringe someone else's patent

A patent is neither necessary nor sufficient to commercialize a technology. The patenting decision does not affect the scientific merit of the invention.

Some technologies are unpatentable but can be protected through copyright and know-how licensing.

Some technologies are too costly to develop into a commercial product and a patent doesn’t provide sufficient incentive.

Some patents are hard to track, such that it isn’t possible to detect infringement, and are thus not valuable assets.
Types of Granted Patent Rights

Utility Patent: works to produce a useful result
  Process (ex. making a new chemical or a new business method)
  Machine (ex. camera)
  Article of Manufacture (ex. carpet)
  Composition of matter (ex. adhesive)

Design Patent: ornamental appearance of an article of manufacture
  Design and the applied object are inseparable
  E.g., surface ornamentation of flatware

Plant Patent: distinct & new variety of asexually propagated plant
  Not by tuber propagation, found in an uncultivated state, or by seeds
  E.g., hybrid rose plant with a novel color
Why Patent an Invention?

- Showcase your technology
- Asset when looking for funding (startup)
- Protect against imitators
- Incentive to invest in product development
- Licensing revenue
- Source of recognition for inventors
- Bayh-Dole Act
  - Encourages Universities to commercialize products of government-funded research
What Can Be Patented?

Any process, machine, manufacture, or composition of matter, or improvement thereof

**Must be:**
- Novel: not previously known or used by others
- Useful: have a known use or produce a concrete and tangible result
- Non-obvious: to a person having ordinary skill in the art

**Cannot be:**
- Idea
- Law of nature
- Scientific principle
Novelty (Requirements for Patentability)

For the United States:
- Must file within one year following publication, public use, on sale, or otherwise publicly available

For the rest of the world:
- Absolute novelty is required - must file before first public disclosure
- Public disclosure: publication, conference presentation, non-confidential conversation

Once a U.S. patent is on file, public disclosures are okay
Boston College Intellectual Property Policy obligates inventors to disclose technologies to OTTL before public disclosure
Prior Art (barrier to novelty)

Information or knowledge publicly available before the filing date of the application

Printed Publications
- U.S. patents and published applications
- Foreign published patent documents
- Poster presentations
- Handouts at meetings
- Abstracts
- Material posted on the internet
- Articles, books
- Thesis or dissertation
Usefulness and Non-Obviousness (Requirements)

Usefulness (utility) is generally not difficult to establish.
Non-Obviousness is subjective, often difficult to establish.
Consider the person having ordinary skill in the art – is it obvious?
Cannot be the combination of existing inventions.
Factors considered:
- Commercial success attributable to inventive feature
- Filling a long-felt need
- Doing what others said could not be done or would not work
Inventorship is a legal determination, often made during the patent drafting process (considering contribution to claims). The inventor must contribute to the conception of an invention. Not the same as co-authors of a paper. Incorrect inventorship can invalidate a patent. All collaborators – even those from other institutions – must be recognized.
Ownership of Patents at Boston College

Per the University Intellectual Property Policy, Boston College owns patentable inventions which:

“result from activities related to an individual’s employment responsibilities or conducted with support, in whole or in part, from University-administered funds, facilities, or personnel, including student employees”
are “developed in the course of, or resulting from, work supported, in whole or in part, by a grant or contract with a governmental entity or a nonprofit or for-profit nongovernmental entity”

Students generally may own patentable inventions developed during coursework or in makerspaces, unless:

A University staff or faculty member is a co-inventor
The invention is based on an existing piece of Boston College-owned technology
A sponsored project agreement applies (including course sponsorship)
“Substantial Resources” were used in the development of the invention

All questions about invention ownership should be addressed to OTTL
Patenting Process at Boston College

Invention report (Invention Disclosure Form)
   Documents date of invention, inventors, sponsorship. Provides no protection.
Literature and prior art search
   To evaluate patentability and market potential
Non-confidential disclosure prepared (marketing)
Provisional application prepared and filed
Non-provisional application filed if marketing efforts are encouraging
Inventor involvement is critical
Technology Assessment

Intellectual Property Strength
- Patentability search
- Likelihood of continued research and development

Market Potential
- Market size and growth potential
- Advantages over competition and new features

Commercialization Potential
- Whether additional resources could improve prospects
- Interest from target companies
A provisional patent application is not examined by the USPTO, but allows inventors to preserve a priority date – to know they filed their application first. Once a provisional application is filed, OTTL will focus on marketing the technology and identifying potential licensees.

One year after the provisional application is filed, OTTL must make the decision whether to file a non-provisional application or a Patent Cooperation Treaty (PCT) application, which preserves foreign rights. Under most circumstances, OTTL will choose to file a follow on patent application only if there is a licensee or if a company has expressed overwhelming interest in an invention.

If the inventors disagree with the OTTL decision whether to file a patent application, arrangements can be made for the inventors or the inventors departments to assume patenting costs for the invention, while OTTL continues to market the technology.
The process of obtaining a patent through the OTTL occurs in three major stages:

- submitting an Invention Disclosure Form;
- working with a patent attorney and OTTL to prepare and file a patent application;
- prosecuting the patent application to secure patent rights.

Inventor involvement with outside patent counsel throughout this process is critical to successfully obtaining a patent. The Boston College Intellectual Property Agreement obligates inventors to support OTTL’s prosecution efforts, even after they’ve left Boston College.
Patent Prosecution

Patent prosecution is the back and forth between the USPTO and Boston College during which the patent office determines if the claimed invention meets the necessary criteria to be awarded a patent.

During prosecution, it may be necessary to amend claims or present arguments to overcome an examiner’s rejections in order to obtain an issued patent.

USPTO responses directed from outside counsel to OTTL ("Office Action")

- First Office Action generally about 17 months from date of filing
- Reply to Patent Office – inventors are directly involved in patent office responses

Continued prosecution dependent on market traction

Patent issued - typically 3 years after application was filed, if prosecution continues

Total average cost of US patent: $20 - $40K. International portfolios can cost upwards of $100,000.

Total average time to obtain a US patent: 3-6 years
Overview of Pathway to Commercialization

- **FILE PROVISIONAL APPLICATION (~$10k)**
- **FILE PCT (~$25K)**
- **PCT PUBLICATION**
- **ENTER NATIONAL PHASE & PROSECUTION (~$20k)**

**Timeline:**
- **3 MONTHS** Disclosure
- **12 MONTHS** Initial Evaluation
- **8 MONTHS** Re-Evaluation
- **6 MONTHS** PCT Evaluation
- **12 MONTHS** Patentability & Marketing Evaluation
- **MARKETING/SEARCH FOR LICENSEE**
- **DRAFT TECH SUMMARY**
- **ADDITIONAL PUBLICATIONS WITH INTERESTING ANIMAL DATA, PROTOTYPING, FURTHER COMMERCIALIZATION**