How to protect innovation?

A primer on formal appropriability mechanisms

Dr. Oliver Alexy
Linking to your course documents

- This directly ties into your session on capturing value from innovation
- This is also brilliantly described in the assigned reading: Teece (1986) uses the term “formal appropriation mechanisms”
- In particular, I will be speaking about
  - Patents
  - Designs
  - Trademarks
  - Copyrights
- Goal: understand basic functionality of and differences between the various formal appropriation mechanisms
Patents

• The Form of IP protection for “Technological Invention”

• First Introduced …
  – Originally associated with the granting of Monopoly Rights …
    • 1449 - the earliest known English patent for invention was granted
    • Gave a 20-year monopoly for a method of making stained glass, required for the windows of Eton College.
  – Some countries (Russia, China) only recently introduced …

• Think about the following: Why is a patent NOT a monopoly???
What is a patent…

• A patent is a right of ownership over an invention, which is granted to an inventor by a government for a specified period of time. The patent owner, or patentee, has the right to sell the patent, license it, or prevent other from making, using or selling the invention without permission. Patents are territorial rights; so a UK Patent relates only to the United Kingdom. After the end of the patent term, or if the patent should lapse, the invention becomes freely available to all.

• Patents generally cover inventions of products or processes that possess or contain new functional or technical aspects (i.e., the functional aspects of tangible technologies: how things work, what they do, how they do it, what they are made of)
... and what is patentable?

- To be patentable, an invention must …
  - Be new – prior public disclosure can invalidate an application
  - Contain an ‘inventive step’ - i.e., compared with what is already know, it should contain something that would not be obvious to someone with a good knowledge and experience of the subject.
  - Be capable of industrial application – i.e., be capable of being made or used in “industry” (broadly defined). i.e., that the invention must take the practical form of an apparatus or device, a product such as some new material or substance or an industrial process or method of operation.
  - Patent assessors judge whether these conditions are met
  - Undertake searches to see whether patent breaches “prior art”
What cannot be patented

- A ‘scientific’ discovery – without an industrial application
- A scientific method or mathematical method
- An aesthetic creation (e.g., literature, art, music, etc.)
- A device contrary to the accepted physical laws (e.g., a perpetual motion machines, or a time machine)

- [In UK & Europe]
  - Computer program (except if technically novel)
  - A business method (except if technically novel)
  - Invention of a new animal or plant variety
  - A method of treatment of the human or animal body by surgery or therapy; or a method of diagnosis

- Note: major changes currently going on in the US
The patenting process in the UK

Steps…

1. Preparation of the Patent Specification (a legal document)
   - **Claims** – precise legal statement that defines the invention
   - **Abstract** – outline of the technical aspects of the invention
2. Filing of Application – and receipt given
3. Undertake initial ‘Examination and Search’ to investigate novelty
   - Must be done within 12 months of filing of application
5. Patent application is published (within 18 month of filing)
6. Patent Office begins second “Substantial Searches”
   - Begins within 6 months of publication
7. Final Examination: “If your application meets all the requirements of the Patents Act 1977, we will grant your patent, publish your application in its final form and send you a certificate”

Whole process takes 3 to 4 years

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Cost and lifetime of patents

• How Long is the Patent Term?
  – In the UK, 20 years (providing the patent is maintained)

• How Much Does Patenting Cost? ...
  – UK patent office fees are around £200
  – “Typical professional fees* for securing a UK patent can be over £1,000, while making an international application in several countries can cost tens of thousands of pounds in several countries” (UK Patent Office)
    (*fees paid to chartered patent agents) [UK residents must generally apply for a UK patent before applying for patents abroad]
  – After 5 years, must pay ‘renewal fees’ [Yr 5: £50 – Yr 20: £400] e.g., Firm with 1 patent per year over 20 yrs - £4,500 / year in UK fees alone

• Note: 2004 fees
Patenting Cost at the European Patent Office (EPO)

- Filing fee: 100 € / 180 € (online / paper, max. 35 pages)
- "page fee": 12 € for the 36th and each subsequent page
- Search fee (international search): 1,700 €
- Examination fee: 1,565 €
- Designation fee (per state): 85 €
- Fee for grant: 790 €
- Renewal fee (per year): increasing from 400 € (3rd yr) to 1,350 € (10th and subsequent yr)
- Average cost (8 designated states, 10 yrs): ca. 30,000 €
## Why use patents?

<table>
<thead>
<tr>
<th>Reason to use patents</th>
<th>Process Innovation</th>
<th>Product Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure performance</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Licensing revenue</td>
<td>23%</td>
<td>28%</td>
</tr>
<tr>
<td>For use in negotiations</td>
<td>37%</td>
<td>47%</td>
</tr>
<tr>
<td>Prevent suits</td>
<td>47%</td>
<td>59%</td>
</tr>
<tr>
<td>Prevent copying</td>
<td>78%</td>
<td>96%</td>
</tr>
<tr>
<td>Blocking</td>
<td>64%</td>
<td>82%</td>
</tr>
<tr>
<td>Enhance reputation</td>
<td>34%</td>
<td>48%</td>
</tr>
</tbody>
</table>

Cohen, Nelson and Walsh, 2002
GLASS SUPPORT MEMBER

Inventors: Steve Jobs, Palo Alto, CA (US); Kari Baken, Sunnyvale, CA (US); Ross Shrock, Sunnyvale, CA (US); Ben McDonald, San Francisco, CA (US); Michael Nataro, Berkeley, CA (US); Colleen Cantile, San Francisco, CA (US); James O’Callaghan, New York, NY (US); Graham Cook, London (GB); Dariusz Bogatow, New York, NY (US); Scott Nelson, Chichester (GB)

Assignee: Apple Computer, Inc., Cupertino, CA (US)

Notices: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 375 days.

Appl. No.: 10/616,466
Filed: Jul 8, 2003

Prior Publication Data
US 2004/006939 A1 Jan. 15, 2004

Related U.S. Application Data
Provisional application No. 60/369,306, filed on Jul 15, 2002.

Int. Cl. 348/100 (2006.01)
EDGE 11/01 (2006.01)

U.S. Cl. 348/100

Field of Classification Search 52/188; 52/170

Abstract
A monolithic glass member for supporting loads is disclosed. The glass member includes a plurality of glass sheets that are laminated together with one or more bonding layers. One of the glass sheets has a cut out at an edge thereof to receive a connector. The connector provides a means for connecting and supporting the glass member relative to other structures.

27 Claims, 12 Drawing Sheets

References Cited
U.S. PATENT DOCUMENTS
3,058,636 A 4,1972 Beckmann et al. 428/437
3,796,170 A 12,1972 Agawas et al. 52/189

Date of Patent: Jan. 23, 2007
A multiple access, spread spectrum communication system and method for providing high capacity communications to, from, or between a plurality of system users, using code-division-spread-spectrum communication signals. The communication system uses means for providing marginal isolation between user communication signals. The marginal isolation is provided by generating simultaneous multiple steerable beams; using an omni-directional antenna with polarization enhancement; using power control devices to adjust the output power for different users; and using receive steering phase translation for creating marginal isolation.
## Top patenting firms

**Table 9.4.** Top 15 Firms in the World by US Patents Granted in 2004

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Firm</th>
<th>HQ country</th>
<th>Industry</th>
<th>Number of US patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IBM</td>
<td>USA</td>
<td>Software and computer services</td>
<td>3,251</td>
</tr>
<tr>
<td>2</td>
<td>Hitachi</td>
<td>Japan</td>
<td>IT Hardware</td>
<td>2,181</td>
</tr>
<tr>
<td>3</td>
<td>Matsushita Electric</td>
<td>Japan</td>
<td>Electronic and electrical equipment</td>
<td>2,175</td>
</tr>
<tr>
<td>4</td>
<td>Canon</td>
<td>Japan</td>
<td>Electronic and electrical equipment</td>
<td>1,855</td>
</tr>
<tr>
<td>5</td>
<td>Hewlett-Packard</td>
<td>USA</td>
<td>IT Hardware</td>
<td>1,822</td>
</tr>
<tr>
<td>6</td>
<td>Micron Technology</td>
<td>USA</td>
<td>IT Hardware</td>
<td>1,758</td>
</tr>
<tr>
<td>7</td>
<td>Sony</td>
<td>Japan</td>
<td>Electronic and electrical equipment</td>
<td>1,725</td>
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<tr>
<td>8</td>
<td>Samsung Electronics</td>
<td>Korea</td>
<td>Electronic and electrical equipment</td>
<td>1,644</td>
</tr>
<tr>
<td>9</td>
<td>Intel</td>
<td>USA</td>
<td>IT Hardware</td>
<td>1,607</td>
</tr>
<tr>
<td>10</td>
<td>Toshiba</td>
<td>Japan</td>
<td>IT Hardware</td>
<td>1,523</td>
</tr>
<tr>
<td>11</td>
<td>Fujitsu</td>
<td>Japan</td>
<td>IT Hardware</td>
<td>1,500</td>
</tr>
<tr>
<td>12</td>
<td>Siemens</td>
<td>Germany</td>
<td>Electronic and electrical equipment</td>
<td>1,413</td>
</tr>
<tr>
<td>13</td>
<td>NEC Corporation</td>
<td>Japan</td>
<td>IT Hardware</td>
<td>1,334</td>
</tr>
<tr>
<td>14</td>
<td>General Electric</td>
<td>USA</td>
<td>Diversified</td>
<td>1,256</td>
</tr>
<tr>
<td>15</td>
<td>Philips Electronics</td>
<td>The Netherlands</td>
<td>Electronic and electrical equipment</td>
<td>1,250</td>
</tr>
</tbody>
</table>

"Triadic" patent families and industry-financed R&D

Average for 2005-07 or closest available years

Source: OECD 2010
Patent Cooperation Treaty (PCT) is an international patent law treaty, concluded in 1970.

It provides a unified procedure for filing patent applications to protect inventions in each of its 142 contracting states.

BRIICS countries = Brazil, Russian Federation, India, Indonesia, China and South Africa

(Source: OECD 2010)
Wrapping up patents

- Patents offer potentially the strongest IP protection
- But effective only if ‘claims’ are ‘watertight’ (e.g., with new drugs)
- Downside is you reveal your advance to competitors …
  - “The description [of the invention] must be sufficient on its own to allow the invention to be carried out by someone skilled in the field of technology to which the invention relates.” [UK patent office]
- Patentee must police own patents against infringement
- Can only sue if infringement is discovered
  - Legal action is expensive and uncertain (patent may be revoked)
  - Often better to settle out of court than risk expense and defeat
- Most patents are, sooner or later, ‘designed around’
- In short Patent Protection is fairly expensive & uncertain
Other Means of Protecting Intellectual Property

• Registered (industrial) designs
  • "The ornamental or aesthetic aspect of a useful article". These are registered as a design patent or certificate of registration. They must be novel and repeatable in commercial quantities.

• Registered trademarks
  • "A sign which serves to distinguish the product of one enterprise from the products of other enterprises". A trade mark must be visible and can include names, existing or invented words, letters, logos, numbers, pictures, scents, symbols, colours and sounds.
Registered Designs

• **What is a Registered Design?**
  – “A registered design is a monopoly right for the appearance of the whole or a part of a product resulting from the features of, in particular, the: lines; contours; colours; shape; texture; materials of the product or its ornamentation.” (UK Patent Office)

• **To Qualify, A Design Must ...**
  – **Be New** – i.e., not the same as another design in the public domain
  – **AND Have Individual Character** – i.e., “the overall impression it produces on an informed user of the design must differ from the overall impression produced on such a user by any design which has already been made available to the public.”
    [Assessment takes into account the degree of freedom of the designer in creating the design]
Registered Designs: Costs and Lifetime

- Registering a Design...
  - Takes about 3-4 months (can be as little as 6 weeks)
  - Costs £60 in the UK (except textile products - £35)
    - Renewal fees payable every 5 years (from £130 to £450)
    - Can be registered up to 12 months after market introduction
      - Unlike patents, does not need to be kept secret

- How Long is the Term?
  - 25 years (subject to payment of renewal fees every 5 years)
Wrapping up registered designs

- Registered Designs are cheap relative to patents
- But only protect ‘Product Innovations’ (not Process)
- No central policing - Design Owner must identify infringements
- Probably difficult to enforce except for direct copies
  - Disputes about ‘similar designs’ likely to involve legal action
- Protection only relates to the UK
  - But designs registered in last 5 yrs viewable on the Internet
  - Potential for unprotected copying & manufacture abroad
- Overall, this is not a strong form of IP protection
  (unless you are willing to sue and have deep pockets)
Introducing: registered trademarks

- A trade mark is any sign which can distinguish the goods and services of one trader from those of another. A sign includes, for example, words, logos, pictures, or a combination of these.
- Trademarks generally relate to a series of products rather than an individual technology or product.
- Relates to a brand and reputation, not individual advances.
- Long history of producers’ ‘marks’, but unregistered.
- To gain specific protection, mark needs to be registered …
  - Legal trademarks first introduced in France in 1857.
  - Registered trades marks were introduced in UK in 1876.
Registered trademarks

• Fees …
  – £200 for 10 years for one class of good or services
    (+£50 for each additional ‘class of good or service’)
  – “A class of goods or services” is predefined (similar to SIC)
    • There are 34 classes of goods & 10 of services

• Advantages and Problems …
  – Relatively cheap form of protection – especially as applies to
    one or more classes of goods and services.
  – Infringement is ‘self policed’ – up to firm to identify infringement
  – Legal disputes can arise with ‘similar marks’
    • “It is easier to prove a mark is the same rather than similar”
Copyrights

• **An Unregistered Right …**
  • Unlike IP forms outlined above, copyrights happen automatically
  • May be indicated by © – but even that is not necessary

• **Background to Copyrights …**
  • Origins in authors’ desire for recognition for creative work
  • But before invention of printing, copying was extremely slow
  • Current problem is low cost of (near) perfect copying

• **What is a Copyright?**
  • Is a right against copying – N.B., protects expression of ideas, not the ideas themselves, which is what e.g. patents would do
    • can rewrite and avoid copyright
  • Applies mainly to artistic works, but also computer software
Copyrights

• Benefits and Problems …
  • Copyrights are “free”, & long lasting
    • literary works protected in UK for 70 years after author’s death; US even longer due to “Mickey Mouse Protection Act”
  • but (like other forms of IP protection) are self-policed
  • Infringements, other than exact copies, are difficult to prove
  • Public attitude makes widespread enforcement difficult

• Other Forms of Unregistered Protection include …
  • Design Rights (in the UK)
    • Applies to 3-dimensional designs and lasts until 10 years after market introduction (or 15yrs from creation of the design)
Copyright Wars, Part I

• **Sony vs. Disney & Universal @ the US Supreme Court**
  • Universal sued Sony for breach of copyright because VCRs allowed consumers to copy material protected by copyright
  • Universal sought damages, and an injunction against the manufacture and marketing of VCRs
  • Sony argued that the VCR was essentially a time shifting device, which allowed people to watch programmes at their convenience
  • Programmes were stored to time-shift, not to redistribute
  • 1979: District Court favours Sony; 1981 Appeals Court Universal
  • 1984: Supreme court came down 5-4 in favour of Sony
  • By such small margins, we now have home video, etc.
Copyright Wars, Part II

• US Supreme Court found Grokster guilty of indirect infringement
• Is Grokster fundamentally different from VCR?
  Many experts think not: both technologies are capable of “substantial non-infringing uses”
  “Inducement doctrine:” Grokster verbally encouraged illegal downloading of copyrighted content

• DMCA, DRM, Grokster etc: Substantial tightening of the copyright regime in the US because of the Internet; Europe is following suit
Copyright Wars, ongoing...

- Pirate Bay lost in lawsuit in Sweden 2009
  - International Federation of the Phonographic Industry against founders of PB (a “torrent tracker”)
  - For aiding the making of copyrighted material available
    - “every music torrent download equals a sales loss”
  - Essentially Grokster remake
  - Pirate Party in SWE to redesign (c) laws
  - Will ISPs be next on the list?
Other (strategic) forms of protection

- Confidentiality agreements …
  - Between two or more parties
    - External – e.g., between two firms, or firm & university
    - Internal – e.g., between firm and its employees
  - Self policed, but easier to police (parties are known)
- Non-compete clauses
- Secrecy
- Complexity of designs
- Lead time advantages
  - i.e., being ahead of competitors …
  - and introducing new products to remain ahead
- Revealing (i.e., publicly disclosing your IP, and making it accessible for others, usually for free)

Think about: **When and why would you do that?**