Intellectual Property and Invention Protection

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October 3, 2013
1. Who am I and how did I end up working in IP?
2. Overview of “Intellectual Property” or “IP”
3. The different types of IP and their relationship to each other
4. Invention Protection: Trade Secrets and Patents
5. Case Study: US 3,769,329 (Monsanto Acetic Acid Process)
6. Conclusion
Overview – What is IP?

“Property”
- Enforceable rights against the world, not a thing
  - Real (e.g. land)
  - Personal (e.g. clothing)
  - Intellectual (e.g. copyright, trade-marks, patents)

“Intellectual”
- Creations of the human mind (WIPO)
  - Expression, inventions, brands, designs, secrecy

CIPO says:
- Just as rights are acquired when a building or land is purchased, IP rights are "property" in the sense that they are based on the legal right to exclude others from using the property. Ownership of the rights can also be transferred.
Overview – Why IP?

1. Incentives and Rewards
   • Incentive and reward to creator to circulate original expression (copyright)

2. Dynamic System
   • Public Interest in that the Community should have access to creativity and innovation

3. Balancing Rights
   • Excessive control limits the ability of the public to embellish creative innovation

4. Future innovation
Overview - Types of IP

1. Copyright
2. Industrial Designs
3. Trade-marks
4. Inventive Protection
   - Trade Secrets
   - Patents
Copyright

• Expression, Fixation, Originality
• Protects expressions, not ideas
• Prevents unauthorized reproduction of original literary, dramatic, musical, and artistic works that required skill and judgment to produce.
• Cheap (vests automatically); long lasting (50 years from death of author)
• Software, project documentation, icons
• Can register in database, but it really automatically vests

• Beware of limitations: Copyright does not protect functionality
• Beware open source licences
• Generally automatically vests in employer
Different Types of IP

Industrial Designs

• Protects original features of shape, configuration, pattern or ornament and any combination of those features that, in a finished article, appeal to and are judged solely by the eye
  • E.g.: car designs, light fixtures, Coke bottle

• No protection for features (1) with utilitarian function, or (2) that are methods or principles of manufacture or construction

• 10 years of protection; relatively inexpensive (generally $2,000 - $3,000 from application to registration) and quick to obtain (~ 1 year from filing)
Different Types of IP

Trade-marks

• Source identifiers
• Protects the use of words/phrases and designs in association with wares and services
• Can be very powerful: Apple, Google, Microsoft, Dell
• Can be registered or unregistered (common-law)
• Registration generally relatively inexpensive: ~ $2,000
• Indefinite protection as long as there is use of the trade-mark and maintenance fees are paid
• Sound marks are now allowable in Canada (e.g. Sweet Georgia Brown (Harlem Globetrotters), MGM lion roar)
• Scent marks?
Trade Secrets

• Any information that
  • is or may be used in trade or business
  • is not generally known in that trade or business
  • has economic value from not being generally known
  • is the subject of efforts that are reasonable under the circumstances to maintain its secrecy

• Recipes; manufacturing processes
  • Potentially indefinite in duration... if guarded
Different Types of IP

Patents

- A statutory right of exclusivity that prevents others from using a new, non-obvious, and useful method, machine, manufacture or composition of matter
- 20 years of protection; can be expensive (anywhere from $6,000 to $15,000 to draft and file an application, depending on invention complexity)
- Includes digital and analog hardware designs; firmware (digital signal processing; microcontroller configured to enable a certain device); many types of software (e.g. software that runs on personal computers)
- Most recently even certain business methods
Different Types of IP

- Pat
- TS
- ID
- TM

(C)
<table>
<thead>
<tr>
<th>IP Right</th>
<th>What is Protected</th>
<th>How to Protect</th>
<th>Term of Protection</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copyright</td>
<td>Original works</td>
<td>Automatic upon creation of work; reg. optional</td>
<td>Typically 50 yrs + life of author</td>
<td>Operation manuals, software</td>
</tr>
<tr>
<td>ID</td>
<td>Designs as applied to useful articles</td>
<td>Registration</td>
<td>10 years from registration date</td>
<td>iMac shape</td>
</tr>
<tr>
<td>Trade Secrets</td>
<td>Confidential business information</td>
<td>Non-disclosure</td>
<td>Indefinitely so long as secrecy maintained</td>
<td>Schematics, customer lists</td>
</tr>
<tr>
<td>Patents</td>
<td>New and inventive innovations</td>
<td>Registration</td>
<td>20 years from filing</td>
<td>Robotic Arm</td>
</tr>
<tr>
<td>TM</td>
<td>Source identifiers used w/wares and services</td>
<td>Common law use and/or registration</td>
<td>Indefinite if use continues (and, for registrations, renewals paid)</td>
<td></td>
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Domain Names

• Disputes may be resolved by arbitration under the Canadian Dispute Resolution Policy (‘’CDRP’’)
  • For .ca domain names
  • Other domain extensions use Uniform DRP (‘’UDRP’’)

• To succeed, must prove:
  • (1) confusing similarity; (2) no legitimate interest; (3) bad faith registration

• Visit: http://trademark-clearinghouse.com/
Plant Breeders’ Rights

• Protects new plant varieties
  • One or more identifiable characteristics that clearly distinguish it from all other varieties in existence
  • Stable in essential characteristics after repeated reproduction or propagation
  • Having regard to particular features, sufficiently homogenous in variety (i.e. patterns are predictable)
• 18 years of protection from date that certificate of registration is issued
• Administered by the Plant Breeders’ Rights Office
• Where’s the IP?

Mott’s Clamato – TM; Pictures – TM; Recipe – TS; Bottles – ID; seal under cap – patent; Special breed of tomatoes? – PBR;
Trade Secrets

• Any information an enterprise considers to be valuable and advantageous over its competitors
  • e.g. formulae, devices, patterns, financial information, business models, client databases, unannounced products, manufacturing or repairing processes
  • KFC 11 herbs/spices recipe; Coca-cola recipe; customer contact databases

• Information must: (1) be secret or shared in the context of confidentiality; and (2) have commercial value owing to secret nature.

• Employer/employee relationship: contracts on assignment of rights, non-disclosure, and non-compete
# Inventive Protection

## Trade Secrets

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
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</thead>
<tbody>
<tr>
<td>• no registration costs</td>
<td>• if secret is embodied in product, then secret may be “reversed engineered”</td>
</tr>
<tr>
<td>• unlimited in time</td>
<td>• no protection if secret is publicly disclosed</td>
</tr>
<tr>
<td>• immediately effective</td>
<td>• protection is useful only against improper acquisition and use or disclosure of confidential information</td>
</tr>
<tr>
<td>• no disclosure or registration with the government</td>
<td></td>
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<tr>
<td>• no territorial limit</td>
<td></td>
</tr>
<tr>
<td>• useful in protecting innovations not protectable by patents (i.e. innovations that are not inventive)</td>
<td><em>The law does not punish fair discovery!</em></td>
</tr>
</tbody>
</table>
Trade Secrets

What happens if there is a breach?

• No statutes in Canada that enforce trade secrets
• Sue under:
  • Breach of contract of non-disclosure agreement
  • Breach of confidence
  • Breach of fiduciary duty

Remember

• Once out, forever out
Invention Protection

Patents: why use them?

• **Trade secret protection** may be unfeasible
• **Exploitation**: a patent is a clearly identifiable asset that may be sold or licensed
• **License** for royalties
  • Includes cross-licensing between global companies
• **Protection** - protect your development path
• **Value**: July 2011: Apple/Microsoft/RIM consortium buys Nortel Network patents for $4.5 billion (6000 patents and applications)
• **Deterrence** - discourage others from using your proprietary technology
• **Optics**
Anatomy of a Patent Application

• A patent is a bargain between the State and Inventor to provide a time limited exclusive right in an invention to the Inventor in exchange for a useful disclosure of the invention from the Inventor to the public.

Requirements of a Patent

• enabling disclosure of the invention to the public
• a clear definition of the boundary of the invention claimed
• Novel, inventive, useful, and patentable subject matter
Enabling Disclosure - the “Specification”

- Must be sufficiently detailed to teach a “skilled person in the art” how to make an embodiment of the invention
- Disclosure describes embodiments of the invention, not the invention
- Best mode requirement (for machines only)
- Must be a useful disclosure: disclosed invention must work as advertised
**Claims**

- Claims are the only part in patent application where invention is defined

- Claims define the boundaries of the exclusive right

- Overly broad claims will result in invalid patent; overly narrow claims are commercially useless
Business Opportunity should define the Claim Strategy

1. What is the invention?
   • product / process / system / method?

2. Optics and Customer Needs:
   • what will it look like?
   • how should it be packaged?
   • handling, shipping, storage issues?
   • fit with customers’ needs & comprehension?

3. Production:
   • fit with existing equipment / systems?
   • requires new systems that need to be developed?
Patentability Search

- Helpful to know what’s out there already - from a legal standpoint, can’t claim what’s already known
- Google patents, CIPO, freepatentsonline, etc…
- Important to know what’s out there at the time of drafting the patent so you can explain to the Patent Examiner why what you’re doing is new and inventive.
  - Can’t add “new matter” later.
You think you have valuable technology. What do you do?

1. Identify the elements that give your company its competitive advantage
2. Ask: are these elements innovative?
3. Determine: are these elements protectable?
4. Acquire patent protection
5. Exercise your patent to full advantage
Case Study: Monsanto and Tennessee Eastman

FOR THE INDUSTRIAL OR CHEMICAL ENGINEER AMONG US

United States Patent Office

3,769,329
Patented Oct. 30, 1973

3,769,329
PRODUCTION OF CARBOXYLIC ACIDS
AND ESTERS
Frank E. Paulik and Arnold Hershman, Creve Coeur,
Walter R. Knox, Town and Country, and James F.
Roth, St. Louis, Mo., assignors to Monsanto Company,
St. Louis, Mo.
Continuation-in-part of abandoned application Ser. No.
628,581, Apr. 5, 1967. This application Mar. 12, 1970,
Ser. No. 2,413
Int. Cl. C07c 51/12, 67/00
U.S. Cl. 260—488 K 20 Claims

ABSTRACT OF THE DISCLOSURE

The present invention relates to a process for the
preparation of carboxylic acids and esters, specifically by
the reaction of alcohols or the ester, ether and halide
derivatives thereof, with carbon monoxide in the presence
of catalyst systems containing as active constituents a
rhodium component and a halogen component. The pro-
cess is also directed to the production of mixtures of
organic acids and/or organic esters.

Monsanto Acetic Acid Process

Image from: http://en.wikipedia.org/wiki/Monsanto_process
This reaction is responsible for producing over 7 billion pounds of acetic acid per year.

Prior to 1970, acetic acid was synthesized on an industrial scale using Co catalysts which required less than optimal conditions (high temperatures and pressures).

Monsanto changed this by commercializing a highly selective rhodium based catalyst that made acetic acid synthesis more commercially viable.

Image from: http://en.wikipedia.org/wiki/Monsanto_process
Case Study: Monsanto and Tennessee Eastman

What is claimed is:

1. A process for the carboxylation of reactants selected from the group consisting of compounds having the formulas ROH where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms, R′—O—R′ wherein R′ is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20,

\[
\begin{align*}
R′ & \text{—C—O—R′}
\end{align*}
\]

wherein R′ is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20, and R—X wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine, said process comprising contacting

(1) at least one of said reactants,
(2) carbon monoxide, and
(3) a catalyst system consisting essentially of
   (a) a rhodium compound, and
   (b) a halogen component

wherein during said contacting, said rhodium compound and said halogen component are present in an amount sufficient to catalyze the carboxylation of said reactants, said contacting being carried out at a temperature in the range of 50 to 300° C. and at a carbon monoxide partial pressure in the range of 1 to 15,000 p.s.i.g., and when said reactants consist of compounds having the formulas

\[
\begin{align*}
R′ & \text{—O—R′, R′—C—O—R′ and R—X}
\end{align*}
\]

said contacting is also in the presence of water, and said halogen component of (3b) is bromine, iodine, a bromide compound or an iodide compound.

Image from: http://en.wikipedia.org/wiki/Monsanto_process
Case Study: Monsanto and Tennessee Eastman

The Monsanto Process was patented in 1973, and had a patent protection period of 17 years from the grant date (i.e. the patent expired in 1990).

The Tennessee Eastman Process was commercialized in 1983 and produced 800 million pounds of acetic anhydride that year. The Monsanto patent was still valid in 1983.

Case Study: Monsanto and Tennessee Eastman

What is claimed is:

1. A process for the carbonylation of reactants selected from the group consisting of compounds having the formulas ROH where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms, R’O—R’ wherein R’ is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20,

\[
\text{R’—O—R’}
\]

wherein R’ is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20, and R—X wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine, said process comprising contacting

(1) at least one of said reactants,

(2) carbon monoxide, and

(3) a catalyst system consisting essentially of

(a) a rhodium compound, and

(b) a halogen component

wherein during said contacting, said rhodium compound and said halogen component are present in an amount sufficient to catalyze the carbonylation of reactants, said contacting being carried out at a temperature in the range of 50 to 300° C and at a carbon monoxide partial pressure in the range of 1 to 15,000 p.s.i.g., and when said reactants consist of compounds having the formulas

\[
\text{R’—O—R’, R’—C—O—R’ and R—X}
\]

said contacting is also in the presence of water, and said halogen component of (3b) is bromine, iodine, a bromide compound or an iodide compound.

Monsanto Process
Case Study: Monsanto and Tennessee Eastman

What is claimed is:

1. A process for the carbonylation of reactants selected from the group consisting of compounds having the formulas ROH where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms, R'-O-R' wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20,

   \[ R'-\text{O}-R' \]

wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20, and R-X wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine, said process comprising contacting

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   (a) a rhodium compound, and
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wherein during said contacting, said rhodium compound and said halogen component are present in an amount sufficient to catalyze the carbonylation of said reactants, said contacting being carried out at a temperature in the range of 50 to 300°C, and at a carbon monoxide partial pressure in the range of 1 to 15,000 p.s.i.g., and when said reactants consist of compounds having the formulas

\[ R'-\text{O}-R', \quad R'-\text{C}-\text{O}-R' \]  and  \[ R-X \]

said contacting is also in the presence of water, and said halogen component of (3b) is bromine, iodine, a bromide compound or an iodide compound.
The Take Home

• IP is how companies protect and monetize technology
• You will encounter IP throughout your careers and daily lives

• Have business awareness: know what’s out there (prior art)
• Identify how you’ve improved on the prior art
  • Useful for trade secrets, patents, business.
• Understand the pros and cons of trade secrets and patents, and keep in mind other forms of IP

Protect and exercise your technology
Thank You

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