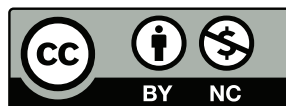

Intellectual Property: Copyrights and Patents



DMCA Abuses

- The DMCA bars technology intended to circumvent controls that protect copyrighted material. It's been abused...
- Lexmark: embedded a chip in its ink cartridges to block third-party cartridge manufacturers; sued a company that worked around the chip
- Chamberlain Group sued a rival maker of garage door openers; the court called the suit an "attempt to leverage its sales into aftermarket monopolies"
- TI sent lawyer letters to individuals who cracked the RSA signing key for TI-83 firmware
- Many more...

Lexmark vs. SCC

“We should make clear that in the future companies like Lexmark cannot use the DMCA in conjunction with copyright law to create monopolies of manufactured goods for themselves just by tweaking the facts of this case. . . . The crucial point is that the DMCA forbids anyone from trafficking in any technology that “is primarily designed or produced for the purpose of circumventing a technological measure that effectively controls access to a [protected] work.” 17 U.S.C. §1201(2)(A) (emphasis added). The key question is the “purpose” of the circumvention technology. The microchip in SCCs toner cartridges is intended not to reap any benefit from the Toner Loading Program—SCCs microchip is not designed to measure toner levels—but only for the purpose of making SCCs competing toner cartridges work with printers manufactured by Lexmark.”

Concurring opinion, 387 F.3d 522 (2004)

Abusing the Anti-Circumvention Provisions

- Many companies are (ab)using the anti-circumvention provisions, especially to stymie competition
- General approach: have some copyrighted code that has some form of access control *to the product as a whole*; sue anyone who wants to enhance or compete with the product
- The competition does not try to *copy* the copyrighted material, but needs to deal with it to work around the anti-competition features
- Note that the DMCA explicitly permits reverse-engineering

Built-in Abuse

- The anti-circumvention provisions create new rights for content owners
- Yes, illegal copying is prevented
- Permissible copying—fair use—is also prevented

File-Sharing

- Individuals obtain a digital copy of some work and distribute it
- The copyright owner is not compensated
- Does this reduce the incentives for creation?
- Or do the pirated copies represent revenue that would never have been realized in any event?
- (Often, there are unauthorized versions of works for which there is no legal version.)
- It violates copyright law as currently written.
- That is not to say that current law is correct

From the Library of Congress Web Site

“Uploading or downloading works protected by copyright without the authority of the copyright owner is an infringement of the copyright owner’s exclusive rights of reproduction and/or distribution. . .

“Whether or not a particular work is being made available under the authority of the copyright owner is a question of fact. But since any original work of authorship fixed in a tangible medium (including a computer file) is protected by federal copyright law upon creation, in the absence of clear information to the contrary, most works may be assumed to be protected by federal copyright law.

“Since the files distributed over peer-to-peer networks are primarily copyrighted works, there is a risk of liability for downloading material from these networks.”

Cost Issues

- Many different components go into the retail cost of a copyrighted item: royalties, performance (for music), editing (for books), acquisition by the publisher, marketing, physical production, distribution, retailer overhead, and more
- Digital distribution affects physical production *only*
- Electronic distribution costs much less, but servers, data centers, Internet connectivity, etc., are not free
- What has changed is the ratio between fixed costs and per-unit costs

The Underlying Issue

<i>Era</i>	<i>Creation Cost</i>	<i>Reproduction Cost</i>
Manuscripts	High	High
Gutenberg	High	Medium
1900	Medium-high	Medium-low
1995	Medium	Low
Now	Medium	Zero

The cost of creating a work has dropped somewhat, because of things like word processors, cheap high-quality sound equipment, etc. The cost of editing, mixing, has probably gone up. But—the cost of reproduction is close to zero. How can the fixed costs be covered?

Related Issue: Open Access Publishing

- Most academics do not profit (or expect to profit) from their writings
- Can professors post their own papers on their web pages?
- Some publishers require you to sign over copyright to them and bar postings
- But some universities (Harvard, MIT, some others) have policies requiring that articles be posted
- But—how will academic publishing houses be supported? Do they add value?

How Peer-to-Peer Works

- Napster: centralized index, but the actual file transfer did not go through the central server complex
- Gnutella and many later systems create *overlay networks*; queries are flooded over the overlay, while file transfers go directly over the Internet
- This latter is far less subject to subpoena attacks

BitTorrent

- Files are divided into chunks
- A *tracker* can tell you which nodes have which chunks
- Different pieces of the file are downloaded from different sites
- Once a node obtains a file, it can offer it for upload
- Download speed is related to upload speed offered—prevent “leeching”

Protecting Copyright

- One approach: suing file-sharers
- But—expensive and unpopular
- New crime: criminal copyright infringement without a profit motive
- “3 strikes” laws—make ISPs responsible for disconnecting repeat infringers

The Problem with ISP Enforcement

- No due process
- People rarely have a choice of ISP
- There's a difference between downloading copyrighted material and downloading the same file without proper permission—but that doesn't show up on the wire

Felony Interference with a Business Model?

- The current structure cannot survive; it was based on technological assumptions that are no longer correct
- (You wouldn't design today's book publishing industry for a pre-Gutenberg era.)
- But—there are still fixed, medium-independent costs that need to be covered
- The challenge: devising a sustainable business model *and* overcoming vested corporate commitments to today's structure

Patents

“a property right granted by the Government of the United States of America to an inventor ‘to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States’ for a limited time in exchange for public disclosure of the invention when the patent is granted.”

USPTO web site

What is a Patent?

- A contract between an inventor and society
- In exchange for teaching how to do something new, an inventor gets a limited-term monopoly on the concept
- Promotes progress in several different ways

Trade Secrets

- An industrial process, etc., that is kept secret, e.g., the formula for Coca Cola
- No time limit to force disclosure
- If you reverse-engineer one or otherwise (legitimately) learn it, you may practice it
- The precise opposite of a patent

Progress from Patents

- Obvious: market incentive to invent things
- Somewhat obvious: people learn from the description
- Somewhat obvious: people can invent and build follow-on items
- Not as obvious: a good patent attorney will try to get the inventor to generalize the invention and think of other, related variants
- Not as obvious: people will try to “invent around” a patent, to avoid paying royalties

What is Patentable?

- Must be “new, useful, and non-obvious”
- Must be a “process, machine, manufacture, or composition of matter”
- Cannot be “laws of nature, physical phenomena, and abstract ideas”
- Cannot be “a mere idea or suggestion”
- Cannot be useful for nuclear weapons only. . . (42 USC §2181)

Novelty

- If someone else invented it earlier, it's not novel
- If someone else published a description, it's not novel
- If it's a straight-forward variant or combination of older items, it's not patentable

Obviousness

- Reference standard for obviousness: “person of ordinary skill in the art”
- Inventors are generally presumed to have more than ordinary skill in the art
- Crucial issue in many software patents

Abstract Ideas

- It has to be some actual way of doing things
- You can't patent, say, a faster-than-light spaceship without giving at least one way to actually build one
- You also can't patent things you just observe, e.g., the law of conservation of energy
- Is software a concrete way of doing things or an abstract idea?

Rights in Patents

- A patent gives you the right to block someone else from practicing your invention
- It does not give you the right to practice it—someone else may have a patent that interferes
- If you have a patent on the pencil and someone else has a patent on erasers, who can manufacture pencils with erasers? Neither of you.

Time Limits

- Generally, patents last for 20 years from filing date
- Priority is given based on when the item was invented
- (Some prefer a “first to file” scheme; this is often held to benefit big companies at the expense of small inventors)
- In the U.S., must file within one year of first publication; elsewhere, must file before any publication
- International patents have the same priority date, under the Patent Cooperation Treaty, but you must file separately in each country where you want protection; unlike copyrights, patents are not automatically in force in other countries

Structure of Patents

- Apart from formal boilerplate, two primary sections: a description of the invention and the *claims*
- The description is effectively a technical paper, with some stylized language, e.g., “taught by” to refer to a citation
- It must give a clear-enough description of what has been invented that one of ordinary skill in the art could replicate the work; material omissions here can invalidate the patent
- The claims delineate what the invention consists of; they’re often quite incomprehensible
- Writing good claims is the heart of a patent attorney’s job

Claims

- “Staking out territory” via very stylized language
- You want to claim as much territory as possible—it doesn’t matter if some is wasteland, if by claiming it you get more productive territory
- Independent and dependent claims; dependent claims describe more specific variants
- (Prevent someone else from patenting that variant)
- A patent is infringed by anything that has all of the elements of any single claim

Extra Elements

- Suppose you've invented the car, and your claim describes “a chassis with four wheels”. Does a six-wheel car infringe?
- Yes—it has all of the claimed elements, *plus* something else
- However, a three-wheeled car would not infringe

“Method of exercising a cat” (US 5443036)

1. A method of inducing aerobic exercise in an unrestrained cat comprising the steps of:
 - (a) directing an intense coherent beam of invisible light produced by a hand-held laser apparatus to produce a bright highly-focused pattern of light at the intersection of the beam and an opaque surface, said pattern being of visual interest to a cat; and
 - (b) selectively redirecting said beam out of the cat’s immediate reach to induce said cat to run and chase said beam and pattern of light around an exercise area.

Other Claims

2. The method of claim 1 wherein said bright pattern of light is small in area relative to a paw of the cat.
3. The method of claim 1 wherein said beam remains invisible between said laser and said opaque surface until impinging on said opaque surface.
4. The method of claim 1 wherein step (b) includes sweeping said beam at an angular speed to cause said pattern to move along said opaque surface at a speed in the range of five to twenty-five feet per second.