



# **Fundamentals of Intellectual Property**

## **MCHE 201 – Spring 2019**

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# Agenda



- Patent type overview
- Typical patent process
- An example case
- US patent reform
- What is the value of a patent?
- Other ways to protect intellectual property

# The First Steps



- Document the invention process
- Know the Intellectual Property policy of your organization/company:
  - UL Lafayette – [http://vpresearch.louisiana.edu/sites/research/files/UL\\_Lafayette\\_Intellectual\\_Property\\_Policy-FINAL\\_April\\_22\\_2013\\_Formatted.pdf](http://vpresearch.louisiana.edu/sites/research/files/UL_Lafayette_Intellectual_Property_Policy-FINAL_April_22_2013_Formatted.pdf)
  - UL System – [http://vpresearch.louisiana.edu/sites/research/files/UL\\_System\\_IP\\_Policy\\_2012.pdf](http://vpresearch.louisiana.edu/sites/research/files/UL_System_IP_Policy_2012.pdf)

# For research results at UL Lafayette



[T]he strong presumption of ownership is to the University (with the originator having a right to share in the benefits derived therefrom). Thus, unless there is convincing and explicit evidence that the IP was developed by University Personnel both outside their Scope of Employment and without more than incidental use of University Resources Usually and Customarily Provided, ownership of the IP rests with the University and the originator(s) are obliged to sign the appropriate legal intellectual property assignment documents.

# For Students at UL Lafayette



Ownership of IP developed by students who are also University Personnel ... will be determined by the rules which apply to all University Personnel. IP generated by students not considered University Personnel and which makes no more than incidental use of University resources in its generation, will be owned by the student but subject to any applicable prior rights of private sector or government sponsors and to the right of the University to use the IP internally at no cost. IP generated by students under the supervision, direction and/or in collaboration with University Personnel shall be deemed IP of Joint Inventorship in accordance with U.S. Patent & Copyright Law and subject to the rules governing Joint Inventorship... UL Lafayette... typically grants exceptions regarding ownership of student inventions when certain criteria are met... at the discretion of the Vice President for Research...

# Patent Types



- Utility Patents – how things work
- Design Patents – ornamental design of a functional product

# Qualifying for a Patent



- U.S. used to be first to invent
  - evidence of conception
  - diligence
  - reduction to practice
- In most other countries, first to file

**Since 3/16/13, US has been first to file as well.**

# Patent Function



- Right to exclude – a patent confers the right to exclude others from making, using, or selling the patented technology for 20 years
- Subject matter:
  - “machine” - apparatus, *e.g.* a computer executing s/w
  - “process” - one or more functions performed by computer software
  - “article of manufacture” - CD-ROM, diskette, DVD storing computer software



# Requirements for Patentability



- New – before filing date of patent application, the invention is not:
  - publicly disclosed
  - used
  - known
  - offered for sale
  - commercially exploited
- Utility, novelty, non-obviousness to “a practitioner skilled in the art”

**Typically “evolutionary” not “revolutionary”  
concepts**

# Common Ways to Lose Patent Rights



- Public demonstration of technology (exhibitions, trade shows, etc)
- Public testing
- Loss of confidentiality
- Commercialization

# Critical Dates



- In most countries, application must be filed before public use or disclosure
- Provisional Patent Applications
  - Give 1 year of protection
  - “We are planning to file a patent on this idea.”

# Step 1: Invention Disclosure



- Form available online:
  - <http://vpresearch.louisiana.edu/innovation/intellectual-property/resources>
  - Completeness speeds assessment and attention

# Provisional Patent Application



- 1 year life – must file patent within 1 year
- For most foreign/international patents must file within 30 months of provisional
- Never issues as a patent
- Must be *enabling* for subsequent applications

# Step 2: Preparation of Utility Application



# Step 2: Preparation of Utility Application



- Iterative process
- “Spoon-feed” patent attorney
- Figures, plots, and drawings are very important

# Contents of US Patent Application

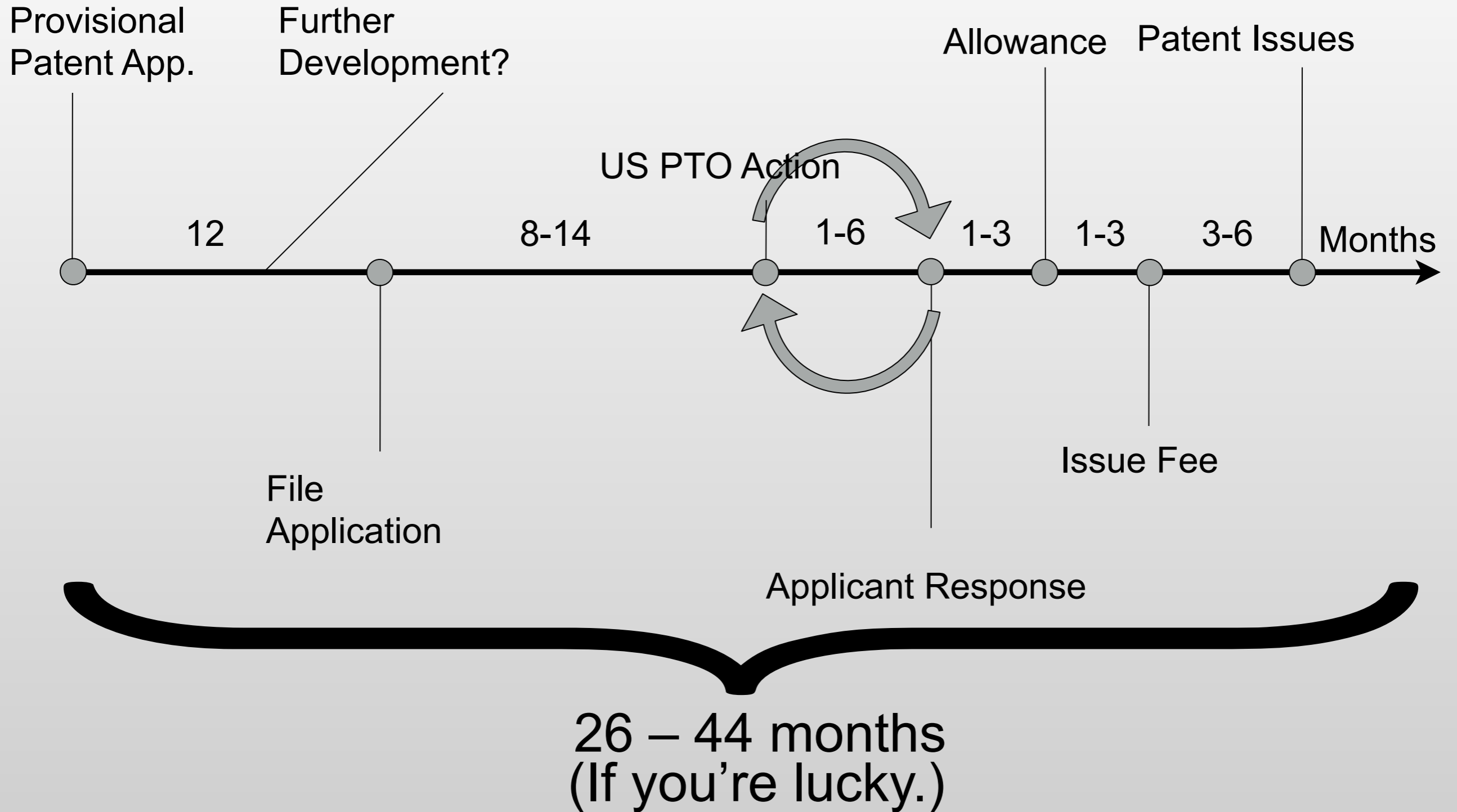


- Abstract - one-paragraph statement of the invention
- Background of the Invention - describes state-of-the-art & context of invention
- Summary of the Invention
- Brief Description of Drawings
- Drawings – flowcharts, perspectives, *etc.*
- Description of Preferred Embodiments
- **CLAIMS**

Entire document supports these



# IP Timeline



# Budgeting for Patents



Activity	Cost
<b>Patent Search Hard Cost</b>	<b>\$500 – \$1000</b>
<b>Search Report and Analysis</b>	<b>\$2500 – \$5000</b>
<b>Patent Application Preparation</b>	<b>Time &amp; \$A Lot</b>
<b>Patent Prosecution</b>	<b>\$10,000 – \$A Lot</b>

# Patent Duration



- Once expired, invention is public domain
- Design patents – 14 years from the issue date
- Utility Patents – 20 years from earliest effective filing date

# Sample Patent Claims



- A method for controlling a physical system by generating an input to the system to minimize unwanted dynamics in the system response comprising;
  - establishing expressions quantifying the unwanted dynamics;
  - establishing first constraints bounding an available input to the dynamic system;
  - establishing second constraints bounding the unwanted dynamics;
  - finding a solution which allows maximum variations in physical system characteristics and is used to generate the input while still satisfying the first and second constraints; and
  - controlling the physical system based on the input to the physical system whereby unwanted dynamics are minimized.

# Sample Patent Claims



- A method for controlling a physical system by generating an input to the system to minimize unwanted dynamics in the system response comprising;
  - establishing expressions quantifying the unwanted dynamics;
  - establishing first constraints bounding an available input to the dynamic system;
  - establishing second constraints bounding the unwanted dynamics;
  - finding a solution which allows maximum variations in physical system characteristics and is used to generate the input while still satisfying the first and second constraints; and
  - controlling the physical system based on the input to the physical system whereby unwanted dynamics are minimized.
- The method of claim 1 wherein the solution is a sequence of impulses which satisfies the first and second constraints while allowing maximum variations in physical system characteristics.

# Sample Patent



- 100 Pages
- 60 Drawings
- 130 Claims
- 3-4 months of writing



US005638267A

**United States Patent** [19]  
Singhose et al.

[11] **Patent Number:** 5,638,267  
[45] **Date of Patent:** Jun. 10, 1997

[54] **METHOD AND APPARATUS FOR MINIMIZING UNWANTED DYNAMICS IN A PHYSICAL SYSTEM**

[75] Inventors: **William E. Singhose**, Pleasantville; **Neil C. Singer**, Armonk; **Stephen J. Derezinski, III**, Pleasantville; **Bert W. Rappole, Jr.**, New York, all of N.Y.; **Kenneth Pasch**, Kennebunkport, Me.

[73] Assignee: **Convolve, Inc.**, New York, N.Y.

[21] Appl. No.: 259,880

[22] Filed: **Jun. 15, 1994**

[51] **Int. Cl.<sup>6</sup>** ..... G05B 13/02

[52] **U.S. Cl.** ..... 364/148; 364/176

[58] **Field of Search** ..... 364/148, 152, 364/153, 176, 177, 164, 165, 183, 149-151, 157, 572, 574, 724.01, 724.12, 728.01, 728.02, 553, 561, 724.19; 318/561

[56] **References Cited**

U.S. PATENT DOCUMENTS

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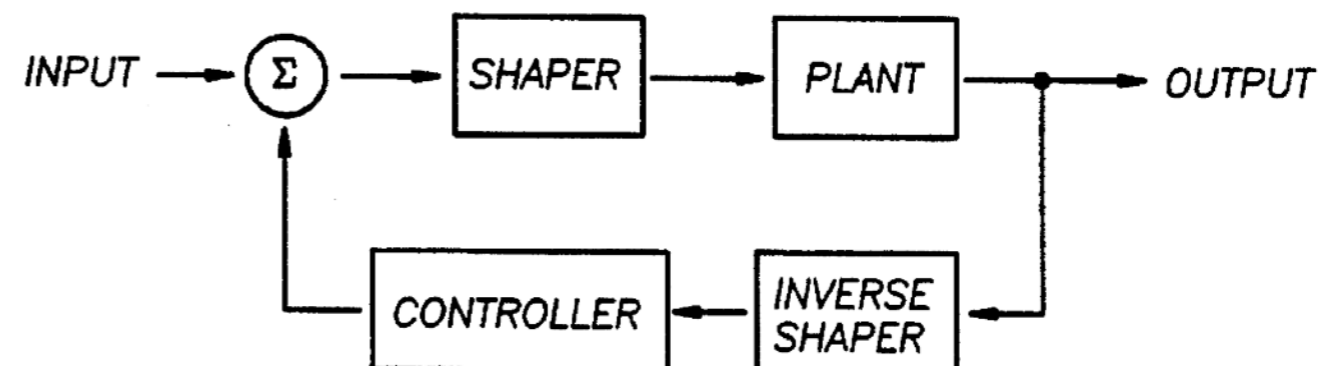
*Primary Examiner*—Joseph Ruggiero

*Attorney, Agent, or Firm*—Choate, Hall & Stewart

[57] **ABSTRACT**

Method and apparatus for minimizing unwanted dynamics in a physical system response. Constraints on the input and on the unwanted dynamics are established, and an impulse sequence which satisfies the constraints is determined. The impulse sequence is convolved with an arbitrary command input to produce a shaped input which is used to drive physical system, thereby minimizing unwanted dynamics. The constraints on the input and on the unwanted dynamics may be selected to achieve shaped inputs and residual unwanted dynamics of various characteristics.

**130 Claims, 60 Drawing Sheets**



# Sample Patent Experience



- July 24, 2000

## Compaq & Seagate Sued For \$800 Million - Company Business and Marketing

[EDP Weekly's IT Monitor](#) , [July 24, 2000](#)

 [EMAIL](#)  [PRINT](#)

Convolve Inc. announced that it and the Massachusetts Institute of Technology (MIT), as obligated through its license agreement with Convolve, filed a lawsuit against Compaq Computer Corp. and Seagate Technology Inc. in the US District Court Southern District of New York, which according to the complaint, seeks "to prevent Compaq and Seagate from stealing Convolve's proprietary computer disk drive technology."

Convolve is seeking at least \$800 million in damages and seeks a permanent injunction barring Compaq and Seagate from manufacturing or selling disk drives or computers incorporating Seagate's "Sound Barrier Technology" (SBT) feature.

### Related Results

- [Cloud Computing Also Hit by IT-Spending Cutbacks](#)
- [Short Term Energy Monitoring: A Road To Long Term Energy Savings?](#)
- [NCS-Omnicare: The New Landscape For M&A](#)
- [Ohio's Health House](#)

Convolve is the exclusive licensee of patented motion control technology called Input Shaping, originally developed at and licensed from MIT. This technology is a method for commanding equipment to move as quickly as possible without excitation of vibrations. In a disk drive application, Input Shaping Control of the read/write arm permits the fast and quiet performance by reducing the vibrations that are generated at the end of the "seek" or the movement of the arm between tracks on the disk. Information can't be written or read by the computer until the arm settles (stops vibrating). These same vibrations are also responsible for much of the noise generated by computers.

# Sample Patent Experience (cont.)



- Jan 17, 2008

## The Board of Patent Appeals and Interferences Decides in Favor of Convolve Against...

Thu Jan 17, 2008 10:55am EST

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[ - ] Text

The Board of Patent Appeals and Interferences Decides in Favor of Convolve Against Seagate in Disk Drive Technology Interference

ALEXANDRIA, Va., Jan. 17 /PRNewswire/ -- The Board of Patent Appeals and Interferences of the U.S. Patent and Trademark Office found in favor of technology company Convolve Inc. and against Seagate Technology Inc. in a patent dispute brought by Convolve against Seagate regarding disk drive technology. The Board denied Seagate's motions challenging the patentability of Convolve's claims. Seagate did not appeal the Board's decision.

Convolve's lead counsel in the interference, Charles L. ("Chico") Gholz of Oblon, Spivak, McClelland, Maier & Neustadt, P.C., said, "We are extremely pleased with the Board's decision, which vindicates Convolve's position that it made the invention in dispute first and that Seagate derived that invention from Convolve. Also, the Board made important law on the proper interpretation of a highly controversial section of the patent statute, 35 U.S.C. § 135(b)(2)." Convolve was represented by Chico Gholz and Todd Baker of Oblon, Spivak.

Convolve and its licensor MIT are also seeking damages in an ongoing lawsuit against Seagate and its customer Compaq Computer Corp. in which Convolve and MIT allege infringement of two related patents as well as numerous trade secret misappropriations, all involving Convolve's proprietary disk drive technologies. The suit was initially filed in July 2000 in the U.S. District Court for the Southern District of New York. A trial date has not been set.

HP, which acquired Compaq in 2002, stated in their recent 10K dated



# Sample Patent Experience (cont.)



- New York Times -  
Dec. 29, 2009



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## Ex-Employee Says Seagate Violated Law

By [ASHLEE VANCE](#) and [DIANA B. HENRIQUES](#)  
Published: December 28, 2009

A decade-long lawsuit pitting a tiny company called [Convolve](#) against [Seagate Technology](#) has taken an unexpected turn after a whistleblower claimed that Seagate had appropriated Convolve technology and later destroyed evidence in the case.

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**Related**

 [Document: New Convolve Motion \(pdf\)](#)

The whistle-blower, a former Seagate employee named Paul A. Galloway, has provided what is described as “an eyewitness account” accusing Seagate of taking hard-drive technology from Convolve and incorporating it into its own products, according to documents filed recently with a federal court in Manhattan.

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# Sample Patent Experience (cont.)



- New York Times -  
Dec. 29, 2009



## Related

 [Document: New Convolve Motion \(pdf\)](#)

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Motion (pdf)

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eyewitness account” accusing Seagate of taking hard-drive technology from

# Sample Patent Experience (cont.)



- Bloomberg - July 28, 2011

## Dell, Ferrero, Lucasfilm, EBay, UMG: Intellectual Property

By Victoria Slind-Flor - Jul 28, 2011 7:01 AM ET

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[Dell Inc. \(DELL\)](#), the world's second- largest personal-computer maker, and two suppliers were told to pay \$5.4 million to closely held [Convolve Inc.](#) after a jury found they infringed a patent related to hard-disk drives.

The federal jury in Marshall, Texas, late yesterday said Dell should pay \$1.5 million, [Western Digital Corp. \(WDC\)](#) \$2.5 million and [Hitachi Ltd. \(6501\)](#) \$1.4 million, according to the verdict sheet posted on the court's

website.

Convolve, based in Armonk, New York, sued in 2008, claiming disk drives made by Western Digital and Hitachi for Round Rock, Texas-based Dell computers infringed its patent 6,314,473. The patent, issued in November 2001, covers a user interface to control the drives and reduce vibrations and noise.

[Western Digital](#), based in [Irvine](#), California, is the largest maker of computer hard-disk drives, and Tokyo-based Hitachi is the third-largest, trailing Seagate Technology Plc. Western Digital said in March it would buy Hitachi's global storage business for \$4.3 billion in cash and stock.

Dell, Western Digital and Hitachi denied infringement, and claimed the patent didn't cover an invention much different than what others in the field had already done.

"We are pleased that the jury award was only 2 percent of what the plaintiff asked for in damages," Steve Shattuck, a spokesman for Western Digital, said in an e-mail. "We are evaluating post-trial and appellate options."

He said the technology feature related to Convolve's patent is no longer used in Western Digital products.

The case is [Convolve Inc. v. Dell Inc.](#), 08cv244, U.S. District Court for the Eastern District of [Texas](#) (Marshall

Marshall (Texas)

# US Patent Reform



Sept. 16, 2011 – Leahy-Smith America Invents Act

- Changed to first-to-file model (with 1-year public disclosure window)
- Allows filing by other than inventor
- 3rd parties can now submit prior-art information
- A nine-month window for challenging an issued patent on any grounds

<http://patents.stackexchange.com>

# First Inventor to File (FITF) provisions



- The First Inventor to File (FITF) provisions transition the U.S. to a first-inventor-to-file system from a first-to-invent system, while including a 1-year grace period for disclosures by (or derived from) applicant. Prior art disclosures made publicly available one year or less before the effective filing date can be overcome by applicant showing (1) the prior art disclosure was by another who obtained the disclosed subject matter from the applicant (a deriver), or (2) the applicant or a deriver publicly disclosed the subject matter before the date of the prior art disclosure. The effective filing date for a claimed invention in an application now includes the filing date of a prior foreign application if applicant is entitled to foreign priority and thus, in this situation, the 1-year grace period will be measured from the foreign priority date claimed. A prior disclosure of the invention which is publicly available more than one year before the effective filing date of an application continues to be a statutory bar. Prior public use or sale is no longer limited to the U.S. For prior art purposes, U.S. patents and patent application publications are available as prior art as of any foreign priority date, provided that the subject matter being relied upon is disclosed in the foreign priority application. Applicants can now rely on common ownership or joint research agreement provisions to overcome rejections under 35 U.S.C. 102. In addition, derivation proceedings are established in place of interference proceedings for FITF applications and patents. The FITF provisions take effect on March 16, 2013. 35 U.S.C. 102 and 103 in effect before March 16, 2013 will apply to applications filed before March 16, 2013, and continuations and divisionals of such applications. 35 U.S.C. 102 and 103 in effect on March 16, 2013, will apply to any application that ever contains a claim that has an effective filing date on or after March 16, 2013. 35 U.S.C. 102(g) in effect before March 16, 2013, will apply if the application ever contains a claim that has an effective filing date before March 16, 2013.
- [http://www.uspto.gov/aia\\_implementation/patents.jsp](http://www.uspto.gov/aia_implementation/patents.jsp)

# US Patent Reform



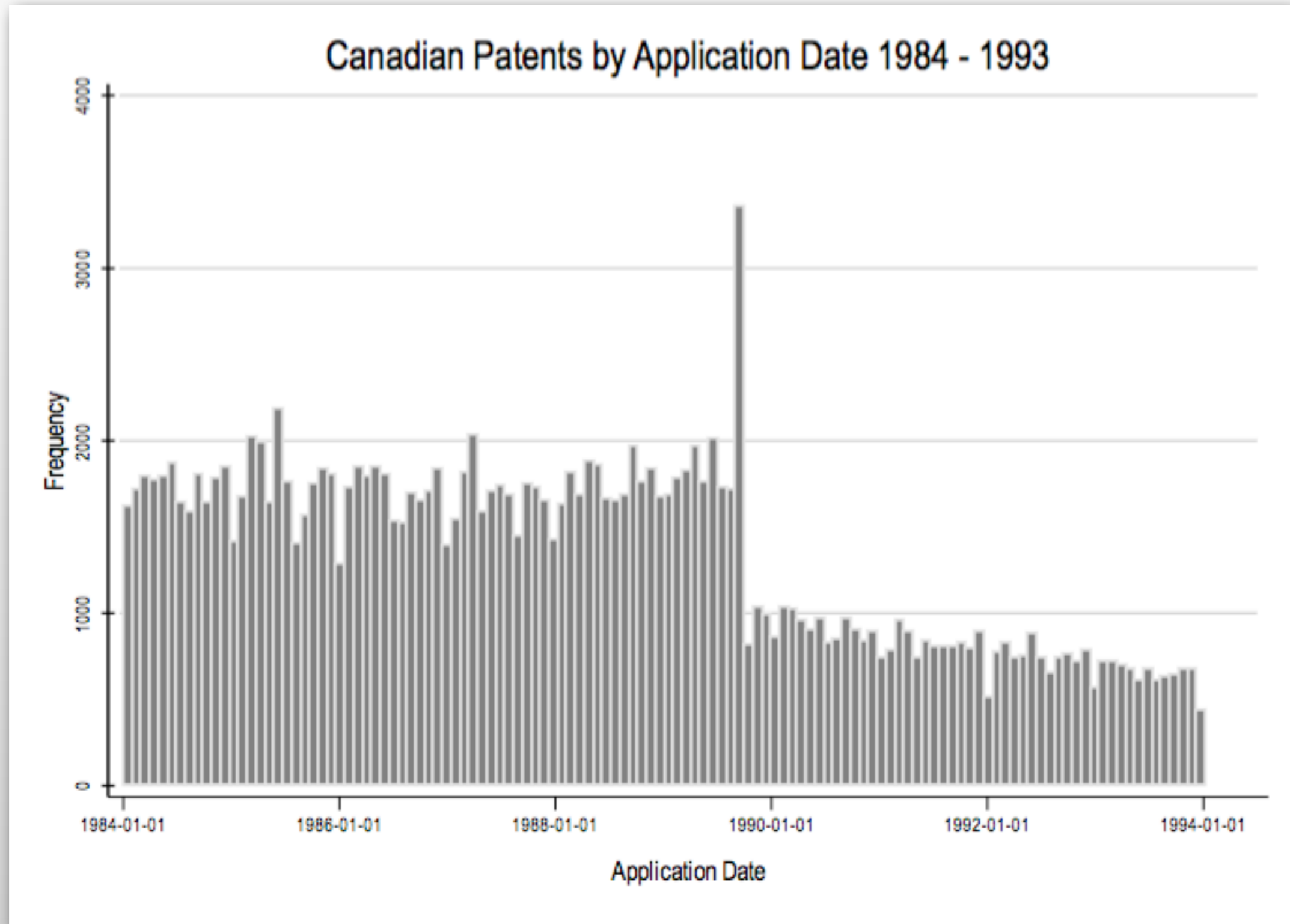
- Arguments for “First to Invent” (FTI)
  - It is more “fair” - the first inventor gets the patent
  - Enables inventors to perfect invention without worrying about being scooped
  - Favors individual inventors
- Arguments for “First to File” (FTF)
  - Administrative simplicity
  - Pushes inventors toward filing early

# Empirical Comparison



- Little work comparing FTI vs. FTF effects on innovation
- Look at recent change in Canada
  - Switched from FTI to FTF in 1989
  - Before 1989, system was nearly identical to ours
  - Look at changes over time in US and Canada
- Abrams, David S. and R. Polk Wagner, “Priority Rules: An Empirical Exploration Of First-To-Invent Versus First-To-File,” 2011. Available: <http://ssrn.com/abstract=1919730>

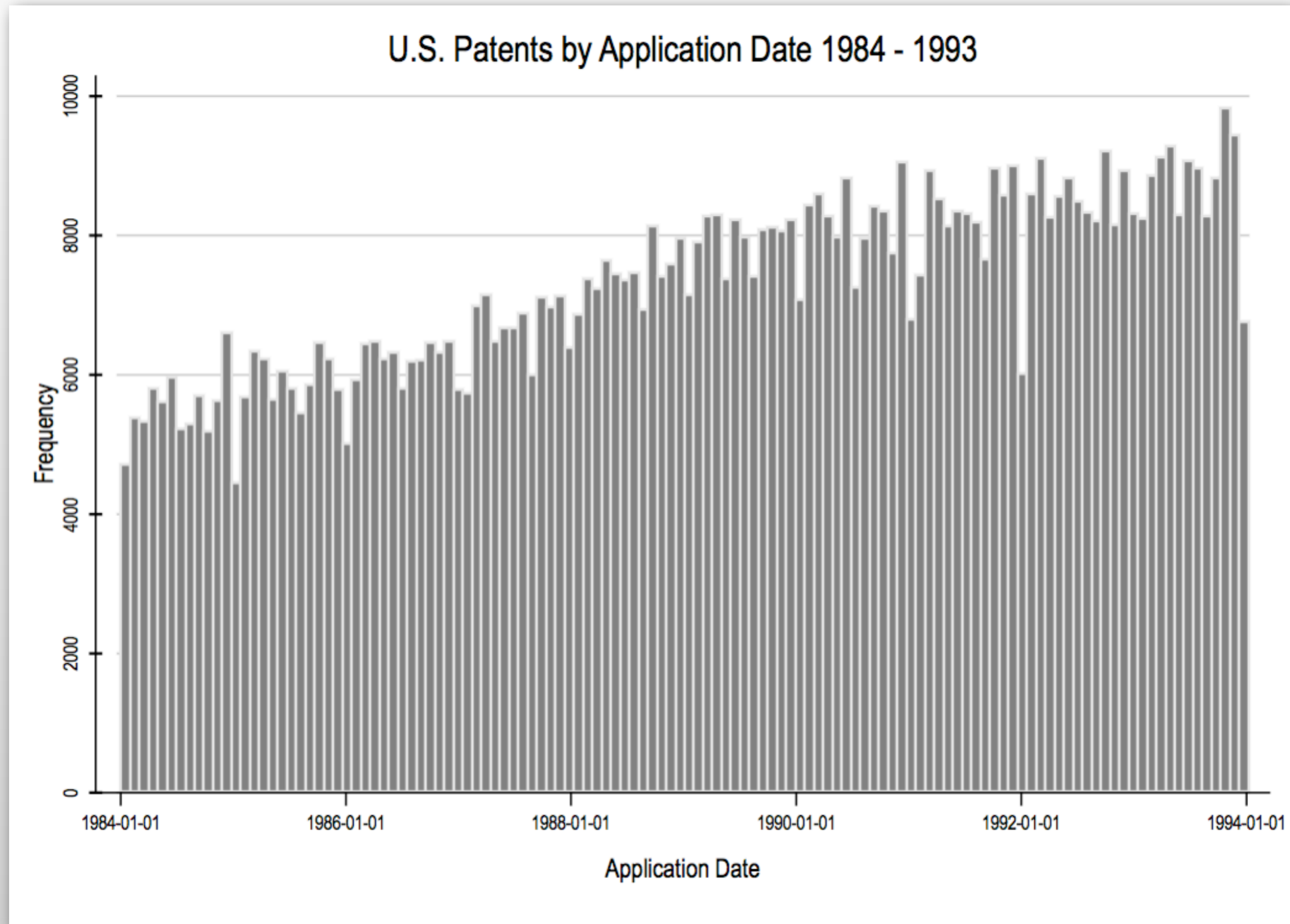
# Patent Rates



Plot from: Abrams, David S. and R. Polk Wagner, "Priority Rules: An Empirical Exploration Of First-To-Invent Versus First-To-File," 2011

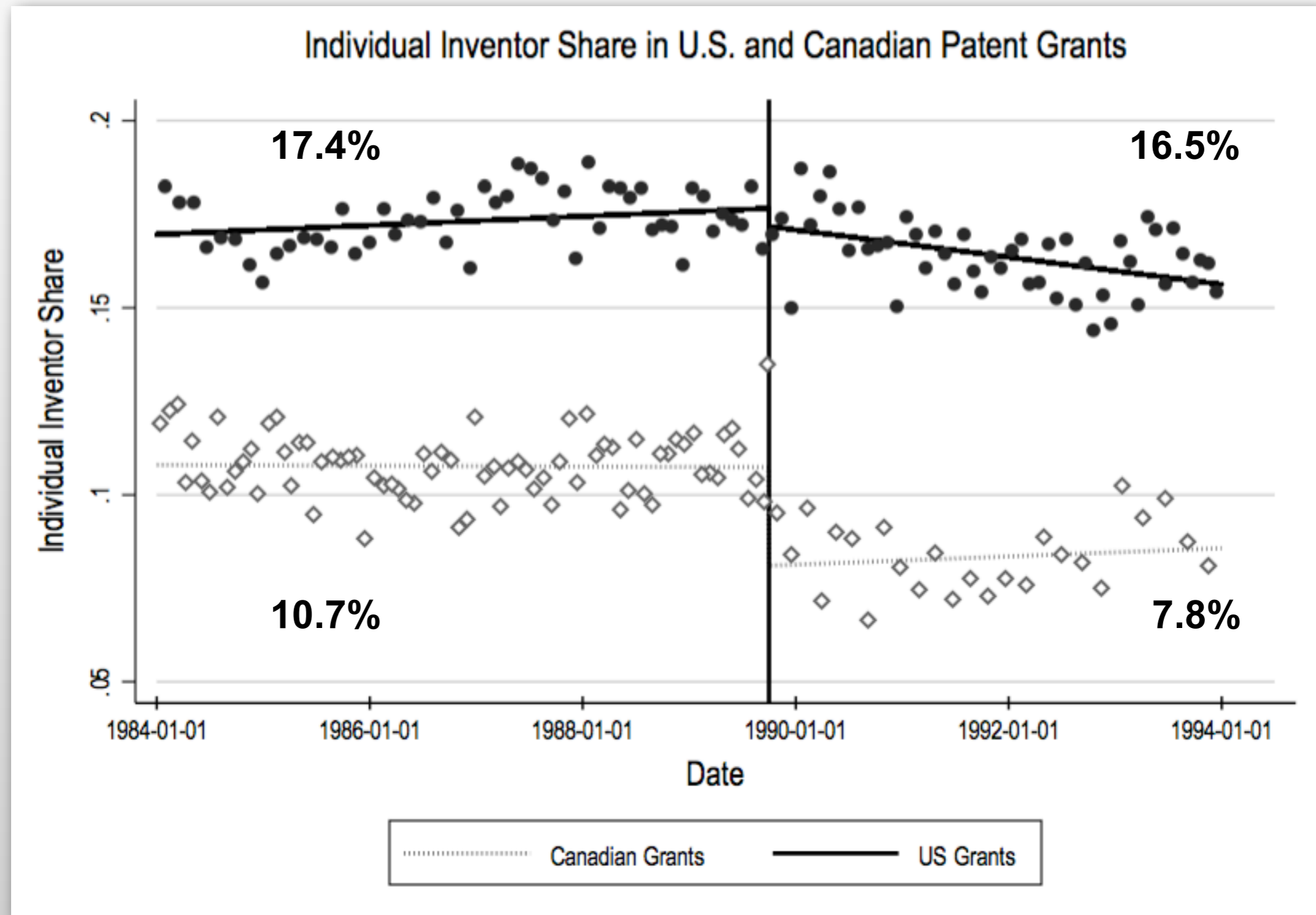


# Patent Rates



Plot from: Abrams, David S. and R. Polk Wagner, "Priority Rules: An Empirical Exploration Of First-To-Invent Versus First-To-File," 2011

# Individual Inventor Share



Plot from: Abrams, David S. and R. Polk Wagner, "Priority Rules: An Empirical Exploration Of First-To-Invent Versus First-To-File," 2011

# Canadian FTI → FTF



- Saw reduction in:
  - Patent rate
  - Percentage of patents from individual inventors
- Impact on innovation and economy unclear

# Patent Value Proposition



- Enhance value
  - increase the valuation of your company
  - source of revenue to company
  - provide collateral that can be used to obtain loans
- Attract investors
  - patents make company more attractive to investors
  - patents are an asset
  - investors prefer companies with limited or no viable competition
- Research & development tax credits may be available in favorable jurisdictions

# Defensive Patent Portfolio Use



- Counter infringement charges – patent protection to counter assertions of infringement (“bargaining chips”)
- Prevent others from patenting – prevent others from obtaining patents to use against you (“blocking patents”)
- Increase Barriers to Entry – patent portfolio forces competitors to obtain claims different from your technology (“building a wall”)

# Offensive Patent Portfolio Use



- Increase Barriers to Entry – seek patent protection to prevent or impede others from engaging in company's business (injunctions)
- Derive Revenue – license patent to obtain revenue stream; damages from infringers
- Exploit patent outside of company's business – use broad patent coverage to reach outside of company business to extract revenue from unreachable sources

# Valuable Patent Characteristics



- Pioneer technology or major improvement
  - Invention creates new industry - transistor, lasers
  - Invention is so new that very little “prior art” exists that can be used to reject claims (result can be broad patent protection)
- Roadblocks – competitors or others must infringe patent to carry out their enterprises (“land mines”)
- Widespread applications – valuable patents often have applications across many different industries

# Copyrights



- Origins – protecting creative works of artists
- Protects Expression (For example, the way the programmer wrote the source code.)
- Rights – exclude others from reproducing, distributing, making derivative works, public display, or public performance
- Term
  - 70 years from creation plus life of last living author
  - 95 years for works owned by corporations
- No Coverage of Function – function performed by software is not protected by copyright



# Trade Secret



- Information that derives economic value from fact that it is not known to public and is subject to efforts to protect its confidentiality
- Trade secret creation/protection: non-disclosure provisions in employment agreement, NDAs, etc.
- Loss of trade secret:
  1. Someone discovers or 'reverse engineers' secret or confidential information
  2. Owner discloses without agreement to confidentiality
- Theft carries civil & criminal penalties under state & federal law

# IP Sob Story #1



- Who is Jerome Lemelson?
- “Far and away the most prolific independent inventor of the 20th century”
  - >500 patents (2nd to Thomas Edison in U.S. history)
  - Machine vision to bar code scanning
- Early career (1950s) focused on toy designs
- Went to cereal manufacturer with idea for cut-out face mask for back of cereal box
- They said “no thanks,” but a few years later...
- Without patent, no way to prevent wholesale theft.

# IP Sob Story #2



- Who was Philo T. Farnsworth?
- Invented Television
  - Figured it out while plowing a field in 1922
- 140+ patents ranged from 1927 – 1966
- Offered \$100K for patent portfolio in 1931
- RCA President Sarnoff “appropriated” technology
- Sarnoff previews TV at '39 World's Fair - steals credit
- RCA put muscle on biggest radio-maker: Philco
  - Threatened to withdraw radio patent licenses
  - RCA paid \$1M for non-exclusive license
- Farnsworth attempted to compete with RCA – but development delayed – patents expire – just before TV explodes after WWII.

# Winning IP/Licensing Story #1



- Who is Bette Nesmith Graham?
- Invented Liquid Paper (White-Out) ca. 1950
- Patents & trademarks filed in '56 after demand skyrockets
- By 1975, company employs 200 people; sells 25M bottles/yr in 31 countries
- In 1979, Gillette buys company for \$47.5M



**Questions?**

# Links of Interest



- America Invents Act Information
  - [http://www.uspto.gov/aia\\_implementation/](http://www.uspto.gov/aia_implementation/)
- Priority Rules: An Empirical Exploration of First-to-Invent Versus First-to-File
  - [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1919730](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1919730)
- The Private and Social Costs of Patent Trolls
  - [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1930272](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272)
- When Patents Attack
  - <http://www.thisamericanlife.org/radio-archives/episode/441/when-patents-attack>
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