

Patents and The Internet of Things (IoT)

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Our Guest Lecturer

- **Gerry Elman** is the president of [Elman Technology Law, P.C.](#) in Media, Pennsylvania. He is a seasoned patent attorney and has also served in Harrisburg as a state Deputy Attorney General and as trial attorney with the federal Antitrust Division. He has science degrees from Stanford and the University of Chicago, and earned his law degree at Columbia.
- He has been working with computers and online information since the early 1980s, when he co-taught the first course on computer law at Temple Law School. He is co-organizer of the TriState.IoT Meetup in the Philadelphia suburbs and leads discussions of legal matters on the **IoClothes.com** online platform.

Outline - 1

- Components of the IoT
- What's a Patent?
 - A property right granted by the government to exclude others from practicing a patented invention without permission
 - What's patentable?
 - The name of the game is the **claim**

Outline - 2

- International Patent Law
- The IoT Patent Landscape
 - Who's getting patents, and for what?
 - Who's asserting their patents against others?
- Patent Enforcement
 - Patent licensing
 - Standard-Essential Patents
 - Legal problems in patent enforcement



“Smart” Everything?

- Smart Homes

- Home security
- Manage energy usage
- Anticipate residents’ needs

- Smart Cars

- >>> Self-driving

- Smart Cities

- Street lighting
- Traffic monitoring
- Public safety
- Public transportation

- Smart Factories

- Industrial sector

- Smart Farms

- Agricultural sector

- Smart Grid

- Electrical power

- Smart Hospitals

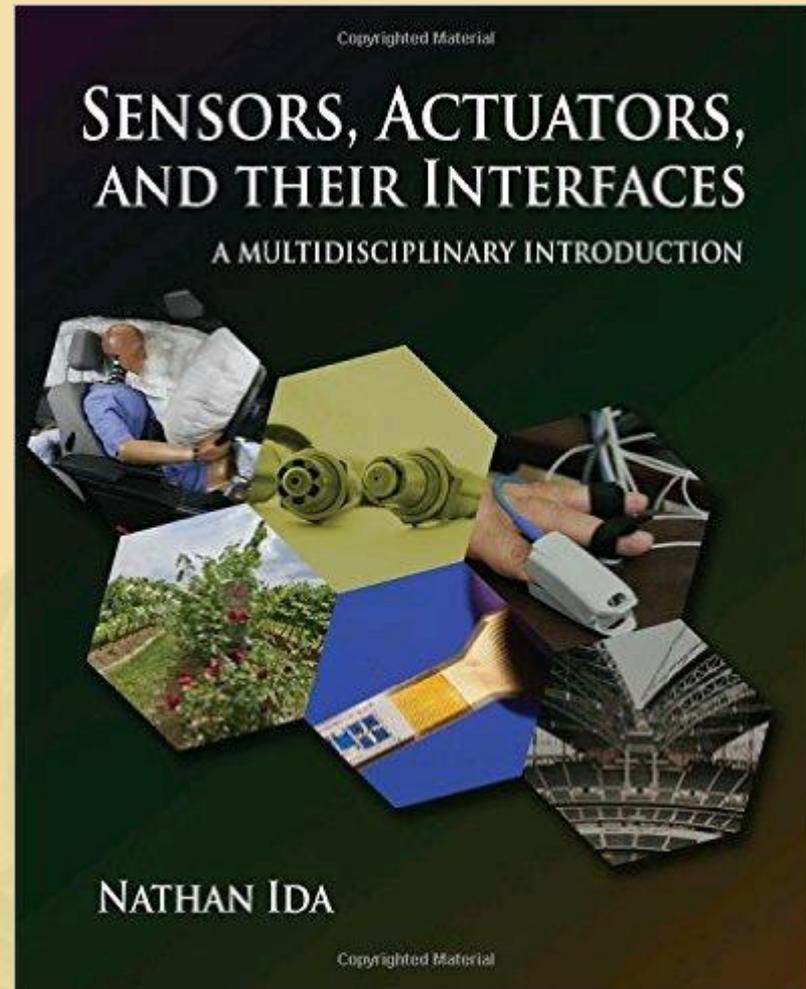
- Medical devices

- Smart Fabrics

- E-clothing
- Personal medical devices

Components of the IoT

- Sensors
- Actuators
- Tags
- Communication Protocols
- Big Data
 - Data Lakes
 - Fog Computing



Federal Patents - from Constitution

- U.S. Constitution, Art. 1, sec. 8, clause 8
- “The Congress shall have Power ...
 - To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries
- Patent Law is codified at Title 35 U.S. Code
- Administered by U.S. Patent & Trademark Office (“USPTO”) in the Commerce Dept.

Congress and the IoT

- Congress takes note:
 - January 12, 2015, Reps. Darrell Issa (R-Cal.) and Suzanne DelBene (D-Wash.) launch [Congressional Caucus on IoT](#).
 - July 29, 2015 Hearing of the Subcommittee on Courts, Intellectual Property & The Internet, House Judiciary Committee
 - 128-page hearing report

Federal Patent Law

- Codified in 1952
- Fed. Cir. Created in 1982
- America Invents Act (AIA) signed Sept. 16, 2011, with parts becoming effective a year later and the rest 18 months later
 - **First Inventor to File** replaced
 - **First to Invent**
- **Patent Trial & Appeal Board** created in 2012 by the America Invents Act (AIA)
 - Appeals from patent examinations
 - **New:** Inter-Partes Reviews (IPRs)

Federal Patent Law - Eligibility

- **35 U.S.C. 101 INVENTIONS PATENTABLE**
 - Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
- This is the “statutory subject matter” or “patent eligibility” requirement.

Federal Patent Law - Eligibility

- Wireless communication protocols are important to the IoT
- But you can't patent a **signal**
- **In re Nuijten**, 500 F.3d 1346 (Fed. Cir. 2007) *cert. denied*, 129 S.Ct. 70 (2008).
 - See Damien Howard, [A Discussion on the Patentability of Signals: Examining *In re Nuijten*](#), 8 Northwestern J. Tech. & Intell. Prop. 131 (2009)

Federal Patent Law - Eligibility

– *Claim on appeal:*

- A signal with embedded supplemental data, the signal being encoded in accordance with a given encoding process and selected samples of the signal representing the supplemental data, and at least one of the samples preceding the selected samples is different from the sample corresponding to the given encoding process.

- *Nuijten* held that a transitory, propagating signal is not within any of the four statutory categories: process, machine, manufacture, or composition of matter.

Federal Patent Law - Novelty

- **35 U.S.C. 102 CONDITIONS FOR PATENTABILITY; NOVELTY.**

- [FOR APPL'NS FILED AFTER SEPT. 15, 2012]

- (a) NOVELTY; PRIOR ART.—A person shall be entitled to a patent unless—
 - (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention; ...

Federal Patent Law - Novelty

- **35 U.S.C. 102(a) CONDITIONS FOR PATENTABILITY; NOVELTY (CONT'D)**
 - or (2) the claimed invention was described in a patent issued under section [151](#), or in an application for patent published or deemed published under section [122\(b\)](#), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

Federal Patent Law - Novelty

- **35 U.S.C. 102 CONDITIONS FOR PATENTABILITY; NOVELTY (CONT'D)**
 - EXCEPTIONS IN 35 U.S.C. 102(b) as amended by the AIA:
 - Qualified 12-month grace period
 - Subject matter was obtained from the inventor
 - Subject matter commonly owned

Federal Patent Law – Non-Obviousness

- **35 U.S.C. 103 CONDITIONS FOR PATENTABILITY; NON-OBVIOUS SUBJECT MATTER**

- A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section [102](#), if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The Patent Application

- **35 U.S.C. 112 SPECIFICATION.**

- (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The Patent Application

- **35 U.S.C. 112 SPECIFICATION.**

- (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
- (c) FORM.—A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form. ...

Patent Prosecution

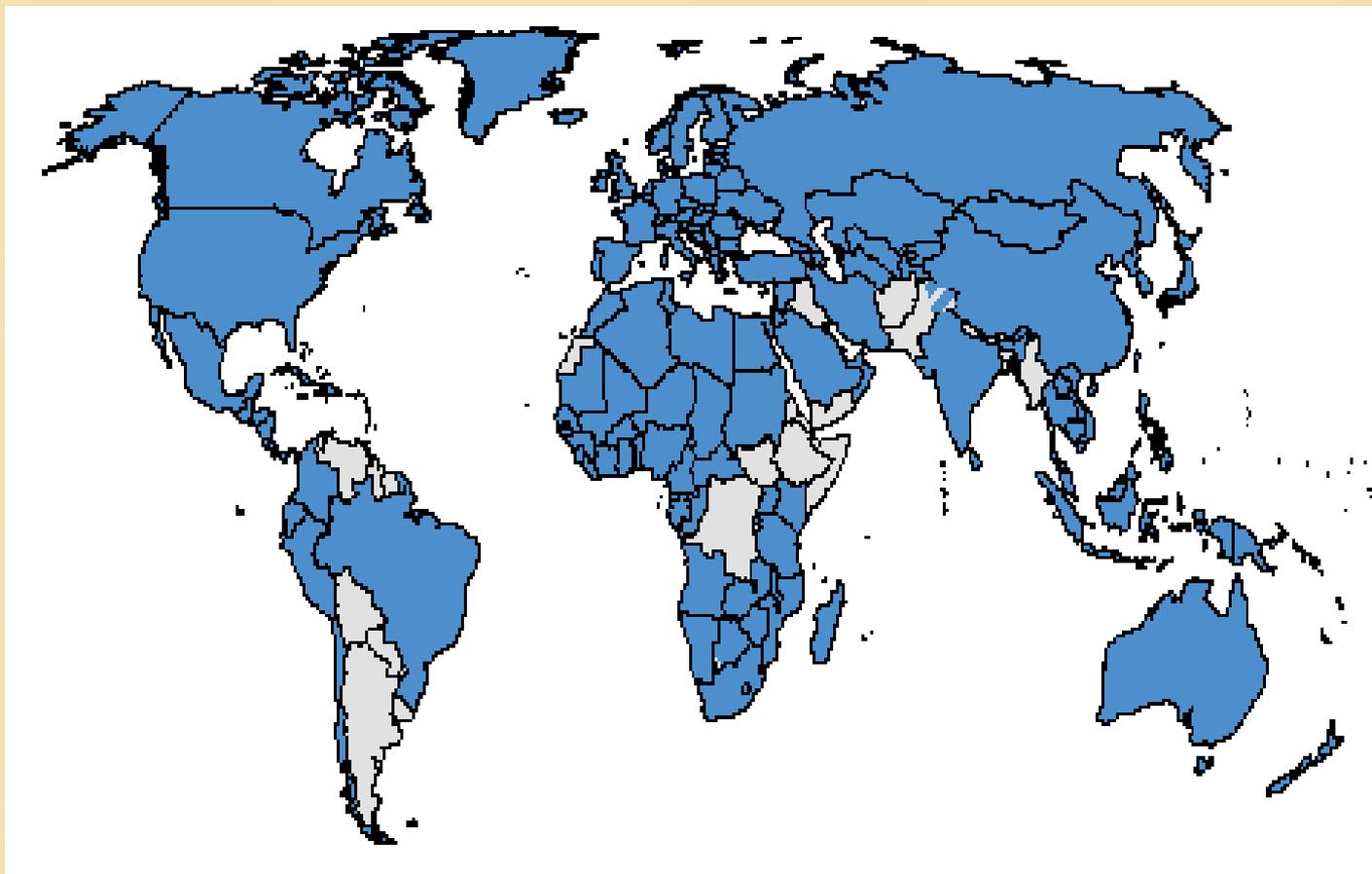
- By a patent attorney or patent agent licensed by USPTO after passing an exam.
- Typically: Start with a **Provisional U.S. Patent Application** that preserves effective filing date for up to 12 months.
- Then file a Non-provisional U.S. Patent Application that enters a queue to get reviewed by a Patent Examiner.
- Examiner reviews the **Specification, any drawings** and **Claims** for compliance with 35 U.S.C. requirements per the Manual of Patent Examining Procedure (MPEP).

World Intellectual Property Organization (WIPO)

- The Patent Cooperation Treaty (PCT) assists applicants in seeking patent protection internationally for their inventions, helps Patent Offices with their patent granting decisions, and facilitates public access to a wealth of technical information relating to those inventions. By filing one international patent application under the PCT, applicants can simultaneously seek protection for an invention in up to 152 member countries (as of Feb. 2018).

Patent Cooperation Treaty

152 member States

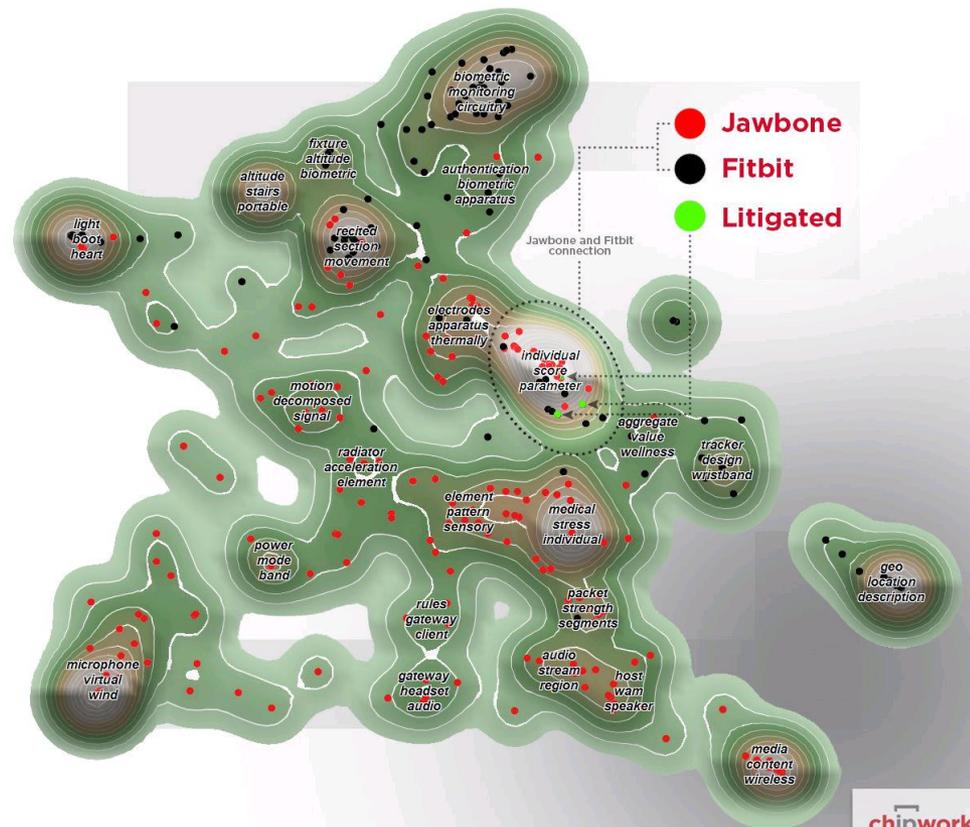


Federal Patent Law - Infringement

- **35 U.S.C. 271 - INFRINGEMENT OF PATENT**
 - **(a)** Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent. ...

IoT Patent Litigation

- AliphCom (Jawbone) & BodyMedia v. Fitbit (N.D. Cal. 2015).



IoT Patent Litigation – Smart Thermostats

- [Honeywell v. Nest Labs](#) (D. Minn.) filed Feb 2012, involves 7 patents
- [Allure Energy v. Nest Labs](#) (E.D. Texas) filed 2013.
- Allure Energy v. Honeywell (W.D. Texas) filed Jan 2015.



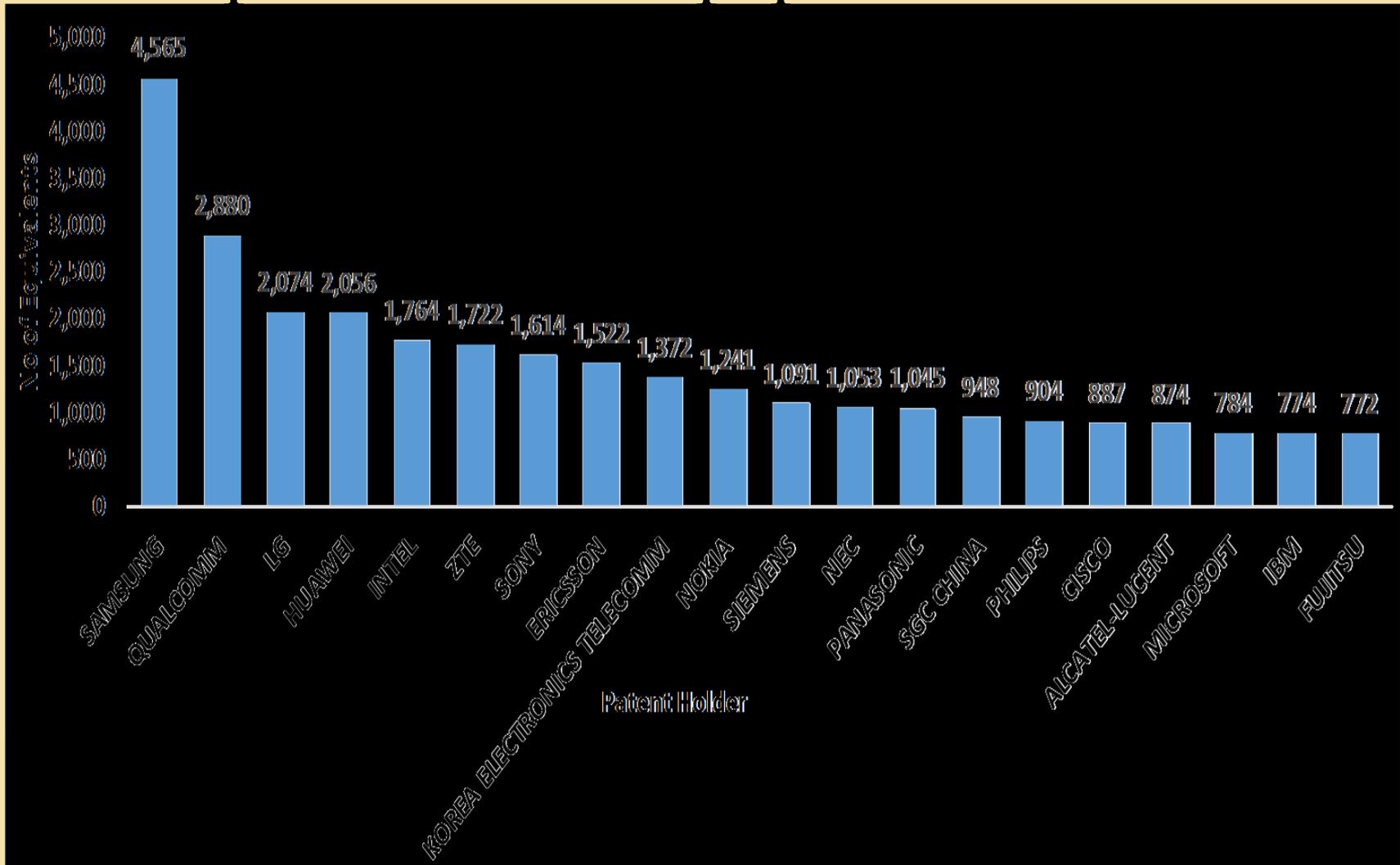
Standards and SEP

- A Standard-Essential Patent (“SEP”) is one that claims an invention that must be used to comply with a technical standard.
- Standardization organizations require licensing of SEP’s to be on terms that are Fair, Reasonable and Non-Discriminatory (“FRAND”).
- For examples of pertinent lawsuits see the [Essential Patent Blog](#)

IoT Patent Landscape

- The top patent holders are from diverse sectors like consumer electronics (Samsung, LG, Sony); telecom (Huawei, Ericsson, Korea Electronics Telecom, ZTE), and software (IBM, Microsoft).
- Qualcomm is the leading filer in multiple jurisdictions as well as PCT filings. This suggests an intention to license its technologies worldwide.
- The network layer has the highest number of patent filings and accounts for 62% of all the IoT patents.

IoT patents – Top patent holders



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IoT Patent Landscape

- Samsung is a key patent holder in most layers of the IoT technology stack and its patents address multiple application areas.
- IoT patent transactions per year have shown an increase after 2011.
- Patent filings related to the upper layers of the IoT stack were relatively less till 2011, but have increased significantly starting in 2012.

When nobody performs all steps?

- **35 U.S.C. 271(b) INDUCEMENT OF INFRINGEMENT**
 - Whoever actively induces infringement of a patent shall be liable as an infringer.
- **35 U.S.C. 271(c) CONTRIBUTORY INFRINGEMENT**
 - Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

Where all the steps of a patent claim are performed, but some by different entities, is anyone an infringer?

It took a long series of decisions in **Akamai Technologies v. Limelight Networks** for the courts to resolve the question.

Akamai V

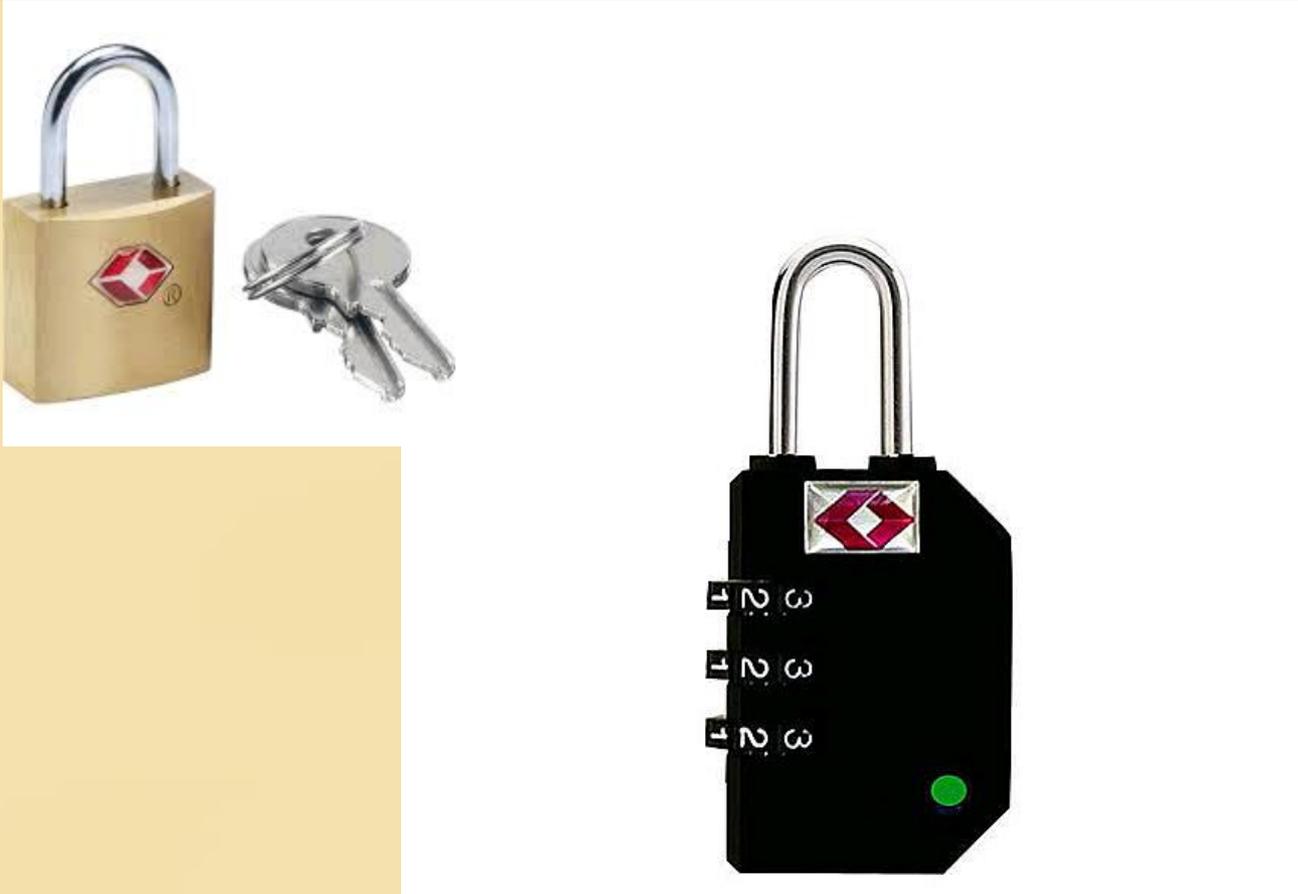
[Akamai Technologies v. Limelight Networks](#)
(Akamai V), 797 F.3d 1020 (Fed. Cir. 2015 *en banc, per curiam*).

- This case was returned to us by the United States Supreme Court, noting "the possibility that [we] erred by too narrowly circumscribing the scope of § 271(a)" and suggesting that we "will have the opportunity to revisit the § 271(a) question...." *Limelight Networks, Inc. v. Akamai Techs., Inc.*, ___ U.S. ___, [134 S.Ct. 2111](#), 2119, 2120 (2014). We hereby avail ourselves of that opportunity.

Akamai V

“Direct infringement under § 271(a) occurs where all steps of a claimed method are performed by or attributable to a single entity. See *BMC Res., Inc. v. Paymentech, L.P.*, [498 F.3d 1373](#), 1379-81 (Fed.Cir.2007). Where more than one actor is involved in practicing the steps, a court must determine whether the acts of one are attributable to the other such that a single entity is responsible for the infringement. We will hold an entity responsible for others' performance of method steps in two sets of circumstances: (1) where that entity directs or controls others' performance, and (2) where the actors form a joint enterprise.”

Divided Infringement?



Tropp U.S. Pat. 7,021,537, claim 1

A method of improving airline luggage inspection by a luggage screening entity, comprising:

- making available to consumers a special lock having a combination lock portion and a master key lock portion, the master key lock portion for receiving a master key that can open the master key lock portion of this special lock, the special lock designed to be applied to an individual piece of airline luggage, the special lock also having an identification structure associated therewith that matches an identification structure previously provided to the luggage screening entity, which special lock the luggage screening entity has agreed to process in accordance with a special procedure,
- marketing the special lock to the consumers in a manner that conveys to the consumers that the special lock will be subjected by the luggage screening entity to the special procedure, the identification structure signaling to a luggage screener of the luggage screening entity who is screening luggage that the luggage screening entity has agreed to subject the special lock associated with the identification structure to the special procedure and that the luggage screening entity has a master key that opens the special lock, and
- the luggage screening entity acting pursuant to a prior agreement to look for the identification structure while screening luggage and, upon finding said identification structure on an individual piece of luggage, to use the master key previously provided to the luggage screening entity to, if necessary, open the individual piece of luggage.

Latest Guidance on Divided Infringement

- [Travel Sentry, Inc. v. Tropp](#), __ F.3d __, Dkt. 2016-2386 (Dec. 19, 2017)
 - Federal Circuit precedent under *Akamai V*, no longer requires that a party “mastermind” or even supervise another’s performance of the method steps. It may suffice that Travel Sentry entered into an MOU with TSA, provided TSA with passkeys and related materials, and instructed TSA on how to identify, unlock and relock the Travel Sentry locks.

ITC Pending Patent Proceeding

- **INTERNATIONAL TRADE COMMISSION**
- **Investigation No. 337-TA-1094**
- **Certain IoT Devices and Components**
- **Thereof (IoT, the Internet of Things)-**
- **Web Applications Displayed on a Web**
- **Browser; Institution of Investigation**
 - **Respondents: Apple Inc., Facebook, Inc., Samsung Electronics America, Inc., Samsung Electronics Co. of KR**

ITC Pending Patent Proceeding

- International Trade Commission (USITC) has voted to institute an investigation of certain IoT devices and components thereof (IOT, the Internet of Things) – web applications displayed on a web browser. The products at issue in the investigation are electronic devices such as smartphones and tablets with certain types of web applications that can be used to perform commercial transactions over the Internet.
- The investigation is based on an amended complaint filed by Lakshmi Arunachalam, Ph.D., and WebXchange, Inc., both of Menlo Park, CA, on November 7, 2017. The amended complaint alleges violations of section 337 of the Tariff Act of 1930 in the importation into the United States and sale of certain IOT devices and components thereof that infringe **U.S. Patent No. 7,930,340**.

U.S. Patent 7,930,342, claim 1

1. A real-time on-line two-way transaction system, the system comprising:
 - a first server comprising memory and a processor;
 - a context manager executing on the first server supporting a first web page on the World Wide Web, the context manager allowing access by a user from a multi-media device through a Web application to a plurality of possible Web transactions from a plurality of Web merchants;
 - a user transaction manager in the Web application allowing the user to enter into a first transaction using a second web page;
 - an account settling manager in the Web application allowing the user to communicate with a payment program running on a second server remote from the first server, wherein the user can settle an account relating to the first transaction;
 - a switching component in the Web application that temporarily switches the user from the first server to the second server to allow settling of the account, wherein the user directly communicates with the payment program on the second server via an object router, the object router allowing the user to perform a real-time transaction from the Web application with at least one of the Web merchants while providing interaction and management between the first and second servers.

Chaos in § 101 Patent Eligibility

- [Alice Corp. v. CLS Bank Int'l](#), 573 U.S. ___, 134 S.Ct. 2347 (Jun. 19, 2014)



See Austin Underhill, [Who is Alice and why is she driving patent attorneys mad as hatters?](#), Above the Law Blog (Feb. 19, 2016)

Chaos in § 101 Patent Eligibility

- USPTO “quick reference sheet” for Patent Examiners issued March 2018
 - Summarizes M.P.E.P. 2106.04 and 2106.05
- Various Fed. Cir. Holdings
 - Alice Tracker from Fish & Richardson

Are IPRs Unconstitutional?

- Can an administrative agency (the PTAB) rather than an Article III federal court kill a granted U.S. patent?
- The PTAB has been conducting Inter-Partes Reviews of patents since 2012. More than 1,000 patents have been held to be invalid.
- On Nov. 27, 2017, the Supreme Court heard oral argument in [Oil States Energy Svcs. v. Greene's Energy](#). Stay tuned.

For Further Information...

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