

To Innovate or Not to Innovate: Lessons from Historical Patent Pools

by

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INTRODUCTION

“Where all think alike, no one thinks very much.”—Walter Lippman (1889-1974)

The journal *Radio Broadcast* published an advertising statement in its 1924 May edition asking the following essay contest question: “Who is to Pay for Broadcasting and How?” The magazines’ editors sponsored the competition to seek not only the best essay response to this particular query, but they also requested contestants to design a definitive plan to solve current issues of intellectual property in radio. *Radio Broadcast* was exceptionally explicit in the guidance they were seeking: “How is the complex radio patent situation to be unsnarled so that broadcasting may develop?” The submissions included over eight hundred manuscripts, yet the winning entry added little substance to a solution for the patent dilemma presented. Mr. H.D. Kellogg, Jr.’s essay, published in the March 1925 issue, proposed a levy on the radio listener, and an additional tax on the tubes and crystals of their receiver, with the fund administered by the U.S. Government. *Radio Broadcast* editors awarded Mr. Kellogg the prize of \$500 for his “most practicable and workable solution of a difficult problem.”¹

The patent “snarl” referred to in 1924 by *Radio Broadcast* was not unique—either for the time, nor to the broadcasting industry. Nineteenth and Twentieth century America often witnessed the reward of a patent subsequently stifling the very inventive spirit that initially earned the monopoly. Patent-holding inventors and companies frequently became embroiled in lengthy and expensive infringement litigation, and definitive evidence exists that such conflicts retarded progress in some industries.² Examine, for instance, the situation between early radio broadcasting giants General Electric (GE) and Westinghouse: by the year 1896, there were over 300 patent suits pending between these companies.³

Simultaneously in radio during this period, the inventor Guglielmo Marconi was patenting radio discoveries, infringing radio patents, and experiencing infringement of his own monopolies. Hoping to make progress in the field and avoid constant legal wrangling over patent issues, Marconi’s strategy was to purchase the companies who were guilty of infringing his patents. From these actions Marconi built an empire in the American radio market, and so as World War I approached, there was a slowdown in broadcasting innovation—the American Marconi Company had no incentive to move forward in light of their industry domination, and consequently, due to competitor purchasing and litigation, no excess funds to invest in innovative efforts.⁴

Industry histories such as that of radio broadcasting demonstrate the relationship between innovation and patent protection is a tenuous one, often studded with conflicting objectives. Innovation, research, and development are clearly rewarded by the issue of a patent, and inventive efforts satisfied in the granting of protection to exclude for a limited period. Yet in that same protection, a variety of obstacles to innovation may arise. Modernly, patenting is in some cases creating a “patent thicket” where overlapping rights must be navigated, often at significant expense, before invention improvements or new ideas may be applied.⁵

¹ *Radio Broadcast*, May, 1924, page 69 and June, 1924, page 161. Published by Doubleday and Page Publishing Company of New York. The contest winner was announced in *Radio Broadcast*, March, 1925.

² Scott, Carole E. “The Radio Inventor/Entrepreneurs”, available at www.westga.edu/~bquest/2001/radio.htm, a sponsored site of the University of West Georgia.

³ Id.

⁴ Id.

⁵ Shapiro, Carl, (2001), “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting,” in *Innovation Policy and the Economy, Volume I*, Adam Jaffe, Joshua Lerner, and Scott Stern, eds., MIT Press.

Additionally, as seen in Marconi's example, the defense of patents and actions against infringers may occupy the inventor to distraction, slowing or even stopping the inventive and improvement process.

One proposed method of overcoming patent roadblocks, such as that experienced by Marconi, is to gather together the conflicting inventions into a collective. The formation of such a "patent pool," which may be defined as an "aggregation of intellectual property rights which are subject to cross-licensing,"⁶ has been described as a factor in both spurring and retarding innovative effort. Patent pools have been reportedly formed to end legal wrangling (sewing machines, movie industry), simplify manufacturing (Davoplane/Pullman folding beds), facilitate information gathering (railroads), fuel war efforts (aircraft manufacturers), seek global industry domination (radio), and protect/promote standard bodies (MPEG-2, DVD technology).^{7 8 9 10} Such patent rights consortiums have also been considered or developed for computer software, biotechnology, and medicines/vaccines, with the intent of eliminating or minimizing the cumulative effect of patent thickets.^{11 12 13}

This article examines two early patent combinations (sewing machines, movie industry) and one more modern pool (MPEG-2 technology), with the intent of identifying factors that may both limit and encourage innovation. Section I introduces the tools used in the analysis, which includes the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) *Antitrust Guidelines for the Licensing of Intellectual Property* (1995, 2017)¹⁴ and Chapter 3 of the DOJ's *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition* (2004)¹⁵, and the "Competitive Hazard Score" model (2004)¹⁶ developed by Economist Richard Gilbert.¹⁷ Section II discusses the general history of patent protection and innovation, while Section III includes a detailed examination of the construction of the Sewing Machine Combination (1856) and Thomas Edison's Motion Picture Patents Company (1908), and application of the DOJ antitrust guidelines and Gilbert's model to these historical patent pools. Section IV looks to the characteristics of a classic patent pool—MPEG-2 technology (1997)—to compare this relatively modern aggregation with the competitive and anti-

⁶ Mireks, Michael S., (2004), "An Examination of Patents, Licensing, Research Tools, and the Tragedy of the Anticommons in Biotechnology Innovation," 38 UMIJLR 141.

⁷ CPTech's Page on Collective Management of IP Rights: Patent Pool, available at www.cptech.org/cm/patentpool.html

⁸ Scott, Carole E. "The Radio Inventor/Entrepreneurs", available at www.westga.edu/~bquest/2001/radio.htm, a sponsored site of the University of West Georgia.

⁹ Usselman, Steven W., (1990), "Organizing a Market for Technological Innovation: Patent Pools and Patent Politics on American Railroads, 1860-1900," in *Business and Economic History*, Second Series, Volume Nineteen.

¹⁰ Kelly, Christopher J., and Kenneth Rubenstein, "Standard Bodies and Patent Tools," Seminar Presentation, New York State Bar Intellectual Property Section, published in seminar handout, pages 91-119.

¹¹ Lin, Daniel, "Research versus Development: Patent Pooling, Innovation and Standardization in the Software Industry," available at <https://repository.jmls.edu/ripl/vol1/iss2/7/>.

¹² Clark, Jeanne, et al., (2000), "Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?," U.S. Patent and Trademark Office, Office of Patent Legal Administration, available at <https://www.scribd.com/document/185431054/PATENT-POOLS-A-SOLUTION-TO-THE-PROBLEM-OF-ACCESS-IN-BIOTECHNOLOGY-PATENTS>.

¹³ Greene, Hillary, *Patent Pooling Behind the Veil of Uncertainty: Antitrust, Competition Policy, and the Vaccine Industry*, 90 B.U.L. Rev 1397 (2010).

¹⁴ U.S. Dep't of Justice & Federal Trade Comm'n, *Antitrust Guidelines for the Licensing of Intellectual Property* (1995, 2017), <https://www.justice.gov/atr/IPguidelines/download>.

¹⁵ U.S. Dep't of Justice & Fed. Trade Comm'n, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition* (2007), available at <https://www.justice.gov/atr/chapter-3-antitrust-analysis-portfolio-cross-licensing-agreements-and-patent-pools>.

¹⁶ Gilbert, Richard J., (2004), "Antitrust for Patent Pools: A Century of Policy Evolution," *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

¹⁷ Emeritus Professor of Economics, University of California-Berkeley.

competitive features of early pools, and make recommendations for the most important components of a patent pool that encourage innovation.

I. TOOLS FOR IDENTIFYING INNOVATION

The relationship between innovation and patent pools is, like the tether between innovation and the solitary monopoly, difficult to delineate. The importance of the connection, however, has clearly been a focus of the U.S. Department of Justice (DOJ), as evidenced by their 1995 (revised in 2017) published guidelines for determining the effect a patent pool will potentially have on innovation.¹⁸ Special Counsel Frances Marshall¹⁹ of the DOJ's Antitrust Division stresses that the Division, despite historically inconsistent treatment of patent rights consortiums in the courts, has an intense concern regarding the issue of patent pools and the foreclosure of new product development and improvement. Ms. Marshall cautions that “a poorly constructed [patent] pool could reduce competition among technologies or it could deter licensees, or third parties, from engaging in research and development and, thus, retard innovation.”²⁰

Closer examination of the anatomy of a patent pool and the nature of innovation in intellectual property provides some insight to understanding the Antitrust Division's concerns and Ms. Marshall's comments. Whether the patent pool encourages or discourages innovation appears to be essentially a function of the elements surrounding its formation, contemporary market conditions, and interpretation by varying judicial authorities. Historically, the essential characteristics or paradigm of what constitutes a patent pool tends to change; what may constitute an acceptable limit on competition in one time period may be unacceptable in another. The separating line between a legally valid pool and an invalid consortium is indistinct and difficult to quantify.

Economics Professor Richard Gilbert sets out a potential evaluative gauge for determining what factors may be relevant in determining the antitrust potential of patent pools in what he termed the “Competitive Hazard Score” analysis.²¹ Gilbert examined 22 patent pool cases and compared factors identified by the courts as pertinent to an antitrust outcome with the competitive factors outlined in the Department of Justice/Federal Trade Commission *Antitrust Guidelines for the Licensing of Intellectual Property*. Isolated factors were assigned weights depending upon the absence, presence, or influence of that element in the court decision; substitute patents (those patents which compete directly) combined with joint royalty-setting among pool participants, for example, earns the highest weight of “4” and demonstrates the greatest risk of competitive harm, while substitutes with royalty-free cross-licensing would possess a “0” weight. All the weights of the various factors are summed, and the higher the resulting “Competitive Hazard Score,” the greater the risk of antitrust effect. Of the cases examined, beginning with *Bement v. National Harrow* in 1902, and ending with the DOJ Business Review Letter to the DVD technology pool in 1999, 12 were held to violate antitrust laws and were invalidated by the courts, while 10 were held to be valid. Gilbert determined for the pools found to be invalid, the average competitive hazard score was 4.8, while the valid pools demonstrated an average score of 2.6. Comparisons between cases demonstrate the

¹⁸ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

¹⁹ As of May 2018, Ms. Marshall is Attorney Appellate Section/Senior Counsel Intellectual Property Division, U.S. Department of Justice.

²⁰ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

²¹ Gilbert, Richard J., (2004), “Antitrust for Patent Pools: A Century of Policy Evolution,” *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

differential treatment by the courts, and the variations existing even within similar elements. The *Bement v. National Harrow* (1902) case, for example, compared to *U.S. v. Krasnov* (1956), shows a level of discrepancies in court determinations. Gilbert assigned *Bement* a competitive factor score of 8, and *Krasnov* a score of 10, and even though the two cases share a high competitive hazard score and the competitive factors of fixing product prices, preventing unilateral licensing, and requiring a joint defense, *Bement* was approved by the court and *Krasnov* disbanded as violating antitrust laws. Another early case with a high competitive factor score of 6—*Standard Sanitary v. U.S.* (1912)—shared three competitive factors with *Bement*, yet like *Krasnov*, was denied by the court.

Despite some anomalies, the pattern emerging from the competitive hazard analysis suggests that the most decisive factor in determining if a pool violates antitrust laws is the presence of restrictive licensing terms. Gilbert suggests that the first task of the courts should be to determine the competitive relationships of the patents in the pool, if the economic effect of pooling arrangements is the primary concern. “As an economic matter,” Gilbert states, “the existence of downstream restraints does not necessarily imply that a pooling arrangement is anticompetitive,” however, “When the patents are substitutes, the pool presents the risk that it increases royalties by eliminating competition among licensors. This risk is present without regard to the prevalence of restrictive licensing terms.”²²

The patent pool factors identified by Gilbert—the historical court emphasis on restrictive licensing, and the presence of substitute patents—could potentially have an effect on innovation, both inside and outside a patent pool boundaries. When pool members are reluctant to license to third parties (and thus create competitors), innovative efforts may be slowed or stalled.²³ The existence of substitute patents in the pool—those patents that compete with each other—may possibly eliminate price competition, resulting in higher consumer prices and subsequently present anti-competitive issues.²⁴ Licensing restrictions and substitute patents tend to especially intersect with innovation over the issue of grantbacks. The grantback requires licensees to provide the licensor with rights to improvements or future products developed with the licensed technology.²⁵ ²⁶ The advantage of the grantback to licensors is the prevention of licensee “hold-up” where permission to use an improvement may be withheld, or double marginalization, where the manufacturer is required to pay two royalties for the product, one to the original licensor, and one to the licensee/inventor of the improvement.²⁷ A broadly drafted grantback can potentially deter innovation, however, by reducing the licensee or inventor’s ability to profit from their improvement.²⁸ Ms. Marshall of the DOJ Antitrust Division believes that any grantback provisions should return only complementary patents—those which do not directly compete—as opposed to substitutes. The patent improvements must be essential to the pool in order to safeguard competition and keep licensing fees low.²⁹

Due to the potential dangers of innovation loss in patent consortiums, the DOJ Antitrust Division developed a rigorous procedure by which the Department examines a patent pool and

²² Gilbert, Richard J., (2004), “Antitrust for Patent Pools: A Century of Policy Evolution,” *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

²³ Lerner, Josh, and Jean Tirole, (2004), “Efficient Patent Pools,” Working Paper 9175, National Bureau of Economic Research, available at <http://www.nber.org/papers/w9175>.

²⁴ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

²⁵ Balto, David A., (2006), “Intellectual Property and Antitrust: General Principles,” 867 *PLI/Pat* 9.

²⁶ Stein, Michael D., and Jeremiah Baunach, (2005), “The Ins and Outs of Patent Pooling,” *From IP to IPO: Key Issues in Commercialising Technology*, available at <http://www.iam-media.com>

²⁷ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

²⁸ *Id.*

²⁹ *Id.*

tests for innovation protections. In addition to the requirement that grantbacks should not be overly broad, the examination includes: first, checking to determine that all the patents licensed by the pool are valid; second, insuring that all the pool licensors grant non-exclusive licenses to the pool; and last, requiring clear delineation of what patents belong to the pool.^{30 31 32}

The Division has a particular concern regarding invalid patents and the foreclosure of innovation. Questionable patents tend to discourage research and development in the technology secured by that patent—competitors are unlikely to infringe and incur litigation costs, and therefore invention surrounding the invalid patent declines. Similarly a competitor who seeks to negotiate a license on the weak patent serves to increase the costs of follow-on innovation through the payment of inequitable licensing fees to the patent holder.³³

The granting of non-exclusive licenses to pool members helps to foster innovation by encouraging licensors to seek alternate “homes” for their inventions, including the formation of new products or pools with complementary patents outside the existing pool.³⁴ Non-exclusive licenses also diminish the potential for infringement and broadly distribute the relevant technology, spurring innovation and providing additional profits to the patent holder.³⁵

The last requirement of the Division is one of clarity—simply careful delineation of what patents belong to the pool, so as to inform potential competitors about their design options in the marketplace.³⁶ Such a demarcation diminishes infringement actions and allows innovative efforts to proceed unhindered.

The focus of the Division on protecting *innovation* leads to questions about the importance of this concept, and how historical innovative endeavors have been safeguarded with regard to intellectual property.

II. THE NATURE OF INNOVATION AND PATENT PROTECTION

The Congressional power to grant a patent right or other intellectual property protection derives from Article I, section 8, clause 8 of the U.S. Constitution, intending 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.”³⁷ The purpose of the modern patent system is to reward innovation and its requisite efforts—as opposed to grants made for

³⁰ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

³¹ U.S. Dep’t of Justice & Fed. Trade Comm’n, Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition (2007), available at <https://www.justice.gov/atr/chapter-3-antitrust-analysis-portfolio-cross-licensing-agreements-and-patent-pools>.

³² U.S. Dep’t of Justice & Federal Trade Comm’n, Antitrust Guidelines for the Licensing of Intellectual Property (1995, 2017), <https://www.justice.gov/atr/IPguidelines/download>.

³³ Michel, Suzanne T., (2006), “To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy—Executive Summary: A Report of the Federal Trade Commission, October 2003,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816, available at <https://www.ftc.gov/reports/promote-innovation-proper-balance-competition-patent-law-policy>.

³⁴ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

³⁵ Clark, Jeanne, et al., (2000), “Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?,” U.S. Patent and Trademark Office, Office of Patent Legal Administration, available at <https://www.scribd.com/document/185431054/PATENT-POOLS-A-SOLUTION-TO-THE-PROBLEM-OF-ACCESS-IN-BIOTECHNOLOGY-PATENTS>.

³⁶ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

³⁷ United States Constitution, Article I, Section 8, Clause 8.

mere favor or patronage. To balance the limited patent monopoly, inventors retain their right to exclude while simultaneously introducing their work to the public domain.

Founding Father Thomas Jefferson, the first official U.S. patent examiner (along with fellow cabinet members Secretary Henry Knox and Attorney General Edmund Randolph), was initially opposed to the granting of patents—he writes to Isaac McPherson, in 1813, that ideas are designed by nature to “freely spread from one to another over the globe,” and “like the air we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation.”³⁸ Jefferson believed that all persons, regardless of position in society or economic means, should have access to technological advances—a philosophy evident in the fact that he never sought patent protection for his own creations and discoveries. Jefferson reconciled his position of granting monopolies with his belief that ideas should be not be “the subject of property,” by focusing on the ability of the patent to encourage innovation.³⁹

One hundred years after Jefferson, Knox, and Edmund considered the first patent applications, the U.S. Patent Office celebrated the accomplishments of the American patent system with a “Congress of Inventors and Manufacturers of Inventions” on April 8, 1891, at the Lincoln Music Hall, Washington, D.C. President Benjamin Harrison attended the session, in which the featured speaker, Charles Elliott Mitchell, Commissioner of Patents, commended the granting of patents as fostering the innovation at the foundation of American expansion. Commissioner Mitchell pointed out that the first issued patent—that to inventor Samuel Hopkins for his method of making potash and pearl ash—was the first of 450,000 grants which had “accomplished wizard-like transformations in a century, which could not have occurred without the stimulus of patents. When the saddle and pillion are compared with the parlor car, when the tallow candle is compared with the electric light, when the messenger boy is compared with the telegraph and the telephone, it is readily seen that the signing of that first patent to Samuel Hopkins was an act of historic grandeur...”⁴⁰

The traditional design of the American patent system is clearly set out by its proponents as a “protection for protection” through which innovation is rewarded and encouraged, while valuable information is publicly disseminated and further invention stimulated. The focus on the act of “innovation” as the primary aspect patenting protects is a longstanding one, with its origins reaching back thousands of years. According to Kenneth W. Dobyns in his history of the U.S. Patent Office, such innovation protection is seen for the first time around 500 B.C., in a Greek colony known as Sybaris. The Sybarites, who “enjoyed living in luxury, made a law that if any confectioner or cook should invent any peculiar and excellent dish, no other artist was allowed to make this dish for one year. He who invented it was entitled to all the profit to be derived from the manufacture of it for that time. This was done in order that others might be induced to labor at excelling in such pursuits.”⁴¹ ⁴² The Sybarites cleverly knew not only how to reward innovative efforts through this mandate, but to encourage further directed invention as well.

The concept of innovation, although often used synonymously with invention, is actually a separate entity from the latter. Innovation is “typically understood as the *introduction* of something new and useful, for example introducing new methods, techniques, or practices or new or altered products and services,” while invention is the “*creation* of new

³⁸ Jewett, Thomas O., (2000), “Thomas Jefferson: Father of Invention,” available at <https://www.varsitytutors.com/earlyamerica/jefferson-primer/father-invention>.

³⁹ Jewett, Thomas O., (2000), “Thomas Jefferson: Father of Invention,” available at <https://www.varsitytutors.com/earlyamerica/jefferson-primer/father-invention>.

⁴⁰ Dobyns, Kenneth W., (1994) *History of the United States Patent Office: The Patent Office Pony*.

⁴¹ Id.

⁴² Dobyns, Kenneth W., after Athenaeus, (1854), *Banquet of the Learned*, tr. C.D. Yonge, *The Deipnosophists or Banquet of the Learned of Athenaeus*, London.

tools or the novel compilation of existing tools.”⁴³ Inventions may certainly be innovative, and innovations be embodied by inventions, yet the terms are not considered by academicians and scholars to be interchangeable.

Business and economic literature has largely considered the concept of innovation a function of the term’s implementation and, not surprisingly, ability to generate profits. A modern emerging approach is to define innovation through its “action” elements; that is *Innovation* “occurs when someone uses an invention--or uses existing tools in a new way--to change how the world works, how people organize themselves, and how they conduct their lives. Note in this view inventions may be concepts, physical devices or any other set of things that facilitate an action. An innovation in this light occurs whether or not the act of innovating succeeds in generating value for its champions. Innovation is distinct from improvement in that it causes society to reorganize. It is distinct from problem solving and is perhaps more rigorously seen as new problem creation. And in this view, innovation applies whether the act generates positive or negative results.”⁴⁴

By protecting and encouraging innovation, a society seeks to simultaneously protect intellectual, social, technical and economic progress. A primary method by which American society chose to protect innovation is through the institution of the U.S. patent system—selectively securing inventor’s rights to the “fruits” of their innovative efforts. Thomas Jefferson, again in his 1813 letter to Isaac McPherson, expressed doubts that a patent grant and innovation are inseparable elements. Jefferson compares the patent system of England with the “patentless” environment of other countries, and notes, “England was, until we copied her, the only country on Earth which ever, by a general law, gave a legal right to the exclusive use of an idea. In some other countries it is sometimes done, in a great case, and by a special and personal act, but, generally speaking, other nations have thought that these monopolies produce more embarrassment than advantage to society; and it may be observed that the nations which refuse monopolies of invention, are as fruitful as England in new and useful devices.”⁴⁵

Modern voices have joined the sentiments of Jefferson in criticizing the patent monopoly, yet the focus is not one only of free access, as was in the mind of the third U.S. President, but also rather the diminution of innovation and progress. Many believe the current American patent system is creating a “dense thicket” of overlapping intellectual property rights, especially in our highly technological era where cumulative investigation is paramount.⁴⁶ Researchers are often faced with difficulties in commercializing new technologies due to the existence of multiple patent holders or blocking patents. Innovation is also stalled or stopped by the types of patents that are currently being issued by the PTO (Patent and Trademark Office): those for business methods, or electronic commerce, for example, which consume a vast swath of the landscape in those fields.

One example of a potentially “roadblocking” patent issued by the PTO was in 2006 to the company Blackboard for their electronic learning platform. Critics of the patent reported that Blackboard’s intent in the secured technology was to capitalize the market and drive competitors out of business, hindering innovation in the process. According to Alfred H. Essa⁴⁷, at the time of his comments Associate Vice Chancellor for Instructional Technology and Deputy CIO of Minnesota State Colleges and Universities, the company rigorously protested that they were “not trying to put anyone out of business. [They’re] not trying to hinder

⁴³ Available at <https://en.wikipedia.org/wiki/Innovation>

⁴⁴ Available at <https://en.wikipedia.org/wiki/Innovation>

⁴⁵ Thibadeau, Robert, (2004), “Thomas Jefferson and Intellectual Property including Copyrights and Patents,” available at <http://rack1.ul.cs.cmu.edu/jefferson/>

⁴⁶ Shapiro, Carl, (2001), “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting,” in *Innovation Policy and the Economy, Volume I*, Adam Jaffe, Joshua Lerner, and Scott Stern, eds., MIT Press.

⁴⁷ As of 2018, Mr. Essa is Vice President, Analytics and R&D for McGraw-Hill.

innovation. [They're] seeking a reasonable royalty.”⁴⁸ Yet one of Blackboard’s first courses of action was to file against a competitor, Desire2Learn, seeking treble damages for willful infringement of the corporation’s issued e-learning patent.⁴⁹

The patent system, while encouraging innovation especially in its early stages, has evolved to the point where some observers believe the modern system demonstrates a negative impact on innovative efforts. Thomas Jefferson warmed to the patent grant after witnessing the innovative spur the exclusive rights incited, “it had given spring to invention beyond my conception.”⁵⁰ Yet in the new America, the scarcity of many aspects—citizens, inventions, financial resources—contributed to a fairly efficient patent system and a manageable number of issued patents. Prior to the Patent Act of July 4, 1836, patents were issued by name and date rather than by number—an unimaginable accounting system for modern times. By December, 1836, the Patent Office had issued nearly 10,000 patents in the 46 years that patents were granted.⁵¹ As technology accelerated in the twentieth and twenty-first centuries, however, the increasing intricacy of the inventions and their improvements, as well as the vast number of issued patents, resulted in a burdensome management scenario for examiners and inventors alike. By the end of 2016, over 9.2 million patents had issued; 8 million of those in just the last 100 years.⁵²

This increasingly complex environment of cumulative innovation and multiple blocking patents has encouraged the formation of circumventing approaches to the “patent thicket,” including patent pooling and standard setting. The goal of such arrangements is to focus on cross-licensing in an attempt to “navigate” or “cut-through” the patent thicket created by two decades of invention, and restore the incentive to invent.

III. HISTORICAL PATENT POOLS AND INNOVATION

A. The Sewing Machine “Combination”

In 1830 a French tailor named Barthelemy Thimonnier (1793-1857) patented the first practical sewing machine, and within a short time his invention was employed to sew uniforms for the French army. The machine was capable of sewing 200 stitches per minute, a marked improvement over the tailor’s best rate of 30 per minute. Thimonnier’s good luck in his innovation was curtailed, however, when on the morning of January 20, 1831, approximately 200 tailors stormed the Thimonnier sewing factory at rue de Sevres and destroyed eighty machines, throwing pieces of what they considered to be a “dangerous threat” to their livelihoods out the building windows.^{53 54}

Thimonnier’s work was expanded upon in 1834 by an American inventor, Walter Hunt (1796-1860). Hunt, who was known as the “Yankee Mechanical Genius” for his development of inventions such as the safety pin and fountain pen, devised a sewing machine with double threads, which was quite comparable to modern machines. Hunt soon abandoned the project,

⁴⁸ Essa, Alfred, (2006), Comments may be found at The Nose: Information Technology in Higher Education, available at http://tatler.typepad.com/nose/2006/08/why_blackboard_.html.

⁴⁹ Id.

⁵⁰ Jewett, Thomas O., (2000), “Thomas Jefferson: Father of Invention,” available at <https://www.varsitytutors.com/earlyamerica/jefferson-primer/father-invention>

⁵¹ U.S. Patent and Trademark Office records; author research, available at <https://www.uspto.gov/web/offices/ac/ido/oeip/taf/issuyear.htm>.

⁵² Id.

⁵³ Museum of American Heritage, *Stitches in Time: 100 Years of Machines and Sewing*, exhibit, (2001), “History of the Sewing Machine,” available at <http://www.moah.org/archivedExhibits.html>

⁵⁴ “Sewing Machines from Past to Present,” available at <http://buisson.pagesperso-orange.fr/english/thimonnier.htm>

though, when he became concerned that the invention would throw “impoverished seamstresses” out of work—he subsequently sold the machine to blacksmith George A. Arrowsmith for a small sum.⁵⁵

Neither tailors nor seamstresses appeared to threaten or concern the next major players in the sewing machine arena: inventors Elias Howe (1819-1867) and Isaac M. Singer (1811-1875). In 1846 Howe received the 5th U.S. issued sewing machine patent for a model with a grooved eye-pointed needle and shuttle that sewed short, straight seams, and Singer patented the first rigid-arm sewing machine (1851). After living, traveling, and unsuccessfully marketing his invention in Europe for a period, Howe returned home to the United States to find that currently marketed sewing machines, including those produced by Singer Manufacturing, were infringing on his 1846 patent.⁵⁶ Predictably, Howe, financially supported by a mortgage on his father’s farm, raced to the courts, seeking injunctions against the variety of interlopers who were capitalizing upon his ingenuity. In February of 1854, the verdict was in—Massachusetts District Court Judge Sprague granted Howe equitable relief by enjoining the infringers. Singer and the other defendants in the case had posed the classic defense to infringement: they pointed to a lack of novelty in the Howe machine, harkening back to the work of Mr. Hunt in 1834. Judge Sprague disparaged the defendants evidence as inconsistent with the law, pointing out that Hunt had abandoned his work and failed to complete his invention or seek patent protection; the Judge wrote “If Mr. Hunt did not go to the extent of perfecting a machine, although he made many ingenious devices, it was, in the eye of the patent law, a nullity; it gave nothing to the public...”⁵⁷

The Sprague decision was followed in short order by a number of other favorable determinations in favor of Howe; he also prevailed in infringement actions against Wheeler & Wilson Co. and Grover & Baker Co., two of the most intense sewing machine competitors of the time. For a short period, Howe’s courtroom victories provided him an absolute monopoly over the sewing machine industry; royalty arrangements with all the infringing competitors earned him \$25 per machine sold. Then, when Howe decided to innovate and overcome some of the defects he perceived in his own designs, he entered a primitive “patent thicket” where he began ironically infringing the mechanical patents of competitors Singer, Grover & Baker, and Wheeler & Wilson. Hence the defeated companies who had previously infringed Howe’s patent immediately filed infringement actions against Howe, perpetuating a vicious pattern of circular litigation.⁵⁸

Sewing machine court litigation was slowing the rate of innovation and invention improvement—not only were Singer, Grover & Baker, and Wheeler & Wilson suing Howe (after just recovering from being sued themselves), but they were simultaneously initiating lawsuits against each other. It was in this atmosphere that the president of Grover & Baker, an attorney named Orlando B. Potter, suggested that the major competitors forego cross-destruction and form a “combination” or patent pool, bringing together all the major patents held by Issac Singer, Wheeler & Wilson, Grover & Baker, and especially, Elias Howe. At the first offer, Howe declined to join the cooperative. He believed that as the holder of a key patent, his exclusive rights would be compromised by such an arrangement. Howe finally agreed to join the combination if the following stipulations were met: (1) at least 24 manufacturers were

⁵⁵ Museum of American Heritage, *Stitches in Time: 100 Years of Machines and Sewing*, exhibit, (2001), “History of the Sewing Machine,” available at <http://www.moah.org/archivedExhibits.html>

⁵⁶ *Id.*

⁵⁷ *See* Howe et al. v. Underwood et al., 12 F.Cas. 678, 1 Fish.Pat.Cas. 160, Case No. 6775 (1854) (“This was an application for a provisional injunction to restrain the defendants from infringing the letters patent [No. 4,750] granted to Elias Howe, Jr., September 10, 1846, for an improved sewing machine, by the use and sale of the Singer machine, so called.”).

⁵⁸ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

to be licensed; (2) equal sharing of all profits; (3) an additional individual royalty (paid to Howe) of \$5 for each machine sold in the United States and \$1 for each exported machine. It is estimated that this arrangement, to which all the parties agreed, earned Elias Howe more than \$2 million between the years 1856 and 1867.^{59 60}

In order for the combination to grant a license, all four parties to the pool—Howe, Grover & Baker, Wheeler, Wilson & Co., and I.M. Singer & Co.—were required to provide consent. All manufacturers were required to pay the royalty, including the member companies, which was set at \$15 per machine sold. The advantage to the licensee, as is often cited as an advantage in modern patent pools, was the payment of a single fee. There were no grantback provisions between the licensors and licensees; and each member company continued to independently perfect their respective machines, without sharing those improvements with the patent pool members.⁶¹

With numerous similarities to modern consortiums, the question arises as to the effects of this first patent pool on *innovation*—in this instance defined as the introduction of something new and useful in the sewing machine realm. The combination, initiated in the year 1856, continued until the last patent, which had twice been extended, expired in 1877. The key Howe patent, which so polarized the early development of the industry, expired in September 1867, and Elias Howe died the next month.⁶²

There is little doubt that the formation and twenty-year operation of the pool reduced litigation between the major patent holders, allowing them greater focus on invention improvement. However, in spite of the combination, litigation was still a concern—so much so that the first cut from the \$15 licensing fee was set aside for infringement prosecution costs. Sources vary as to whether the pool’s existence was conducive to sewing machine development or counterproductive. A treatise from the Smithsonian Institution Libraries entitled “The Servant in the House: A Brief History of the Sewing Machine” by Frederick Lewis Lewton, originally published in *The Smithsonian Report for 1929: Publication 3056*, details the end of the sewing machine combination: “The fundamental principles of the sewing machine were now no longer controlled by any one, the beneficial open competition of the smaller manufacturers was made possible, and an enormous reduction in prices resulted. Many important and radical improvements appeared in quick succession, which greatly multiplied the usefulness of the sewing machine.”⁶³ Lewton’s view is contradicted by author Grace Rogers Cooper in her book “The Sewing Machine: Its Invention and Development” also published by the Smithsonian Institution (1976). Although Ms. Cooper agrees that “from the beginning to the end of the “Combination” there was an army of independents, including infringers and imitators, who kept up constant complaint against it, maintaining that its existence to retard the improvement of the sewing machine made the public suffer thereby,” she points out that “in the period immediately following the termination of the “Combination,” however, only a few improvements of importance were made, and most of these were by the member companies.”⁶⁴ The Museum of American Heritage echoes the observations of Ms.

⁵⁹ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁶⁰ Museum of American Heritage, *Stitches in Time: 100 Years of Machines and Sewing*, exhibit, (2001), “History of the Sewing Machine,” available at <http://www.moah.org/archivedExhibits.html>.

⁶¹ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁶² Available at <http://www.celebrateboston.com/first/sewing-machine.htm>.

⁶³ Lewton, Frederick Lewis, (1930), *The Servant in the House: A Brief History of the Sewing Machine*, Government Publications Office, Washington, DC.

⁶⁴ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

Cooper, citing in their “History of the Sewing Machine” that there were only a few improvements after the “Combination” ceased operations.⁶⁵

It is recorded that numerous small companies attempted to design around the Combination and establish themselves in the sewing machine field. While only 55 patent models are recorded in the Smithsonian Sewing Machine Collection for the period before the Combination began, more than 500 machines were patented during the twenty years the patent pool existed. Inventors outside the Combination attempted to circumvent the patents within the pool—and to patent their own “different machine.” The majority of these inventions were commercial failures, as were the majority of small competitors that also sprung up in the 1856-1877 period. In the years before the Combination, for the companies for which complete records exist, there were less than three dozen sewing machine manufacturers, many of which remained in business for the average of only one year. During the existence of the sewing Combination, there were close to one hundred and forty companies, each in operation for an average of four years, with the exception of the patent pool member corporations. After the patent consortium ended in 1877, and continuing to present day, there were over sixty viable companies, each operating for an average of eleven years. Members of the consortium show the greatest longevity, with an average 64 operating years: Howe, at 20 years (Howe rarely manufactured machines himself, so demonstrates a shorter term than most companies); Grover & Baker, operating for 24 years; Wheeler, Wilson & Co., 49 years in business; and I.M. Singer & Co., the longest lived corporation at 167 years, and still operating today.⁶⁶

When the Howe patent expired in 1867 there were approximately 69 factories producing sewing machines; when this key patent protection ended, many more small companies formed in an attempt to take advantage of the unrestricted availability of this art. Although free of restrictive licensing fees, the majority of the new companies found it extremely difficult to compete with the established giants such as Singer and Wheeler.⁶⁷ The strength of the patent pool companies is evidenced by partial records of their licensing in the ten years prior to the Combination’s termination; from 1867 to 1876, the big four—Singer, Wheeler & Wilson, Grover & Baker, and Howe—licensed almost four million sewing machines, while all other companies together operating in this period licensed under a million.⁶⁸

Other evidence that suggests the Sewing Machine Combination hindered innovation is provided by studies performed by Ryan Lampe and Petra Moser from the National Bureau of Economic Research.⁶⁹ The authors speculate that because the number of stitches per minute sewing machines performed slowed upon formation of the Combination, and increased following the dissolution of the pool, there was little to no innovative effort during the aggregation’s tenure. However, the patents contributed to the pool by the various inventors—Howe’s stich-forming shuttle, for instance, and Wilson’s rotary hook—produced truly

⁶⁵ Museum of American Heritage, *Stitches in Time: 100 Years of Machines and Sewing*, exhibit, (2001), “History of the Sewing Machine,” available at <http://www.moah.org/archivedExhibits.html>.

⁶⁶ Author’s research, as of the year 2018 based on Grace Rogers Cooper data in *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7.

⁶⁷ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁶⁸ Author’s research, based on Grace Rogers Cooper data in *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁶⁹ Ryan L. Lampe and Petra Moser, (2009), “Do Patent Pools Encourage Innovation? Evidence from the 19th-Century Sewing Machine Industry,” NBER Working Paper No. 15061, available at <http://www.nber.org/papers/w15061.pdf>.

productive machines that revolutionized the practice of clothes-making.⁷⁰ Lampe and Moser also suggest that any patenting accomplished during the pool's operating years was strategic as opposed to innovative—intended to place the filing inventor in a more advantageous position within the cooperative.⁷¹ Yet any changes that improved the viability of machines would contribute to practical use and be considered potentially “innovative” in the mid-nineteenth century.

Besides the anecdotal historical evidence that exists regarding the “Combination,” the sewing machine consortium may be examined, within the constraints of limited records, by the U.S. Department of Justice's modern parameters for determining a patent pool's effects on innovation.

The DOJ's initial step involves checking to determine that all the patents licensed by the pool are valid. In the case of the sewing machine consortium, there were seven inventions detailed as being the primary ones in the pool: (1) the grooved, eye-pointed needle used with a shuttle to form the lockstitch (Howe patent); (2) a four-motion feeding mechanism (Wilson patent); (3) the needle moving vertically above a horizontal work plate (Bachelder patent, held by Singer); (4) a continuous feeding device by belt or wheel (Bachelder patent, held by Singer); (5) a yielding presser resting on the cloth (Bachelder patent, held by Singer); (6) a spring or curved arm (Morey and Johnson patent, held by Singer); and (7) a heart-shaped cam as applied to moving the needle bar (Singer patent). The Grover & Baker company also reportedly contributed several other complementary patents to the Combination.⁷² Although there was considerable litigation claiming invalidity of the patents in the sewing machine pool, all the patents in the consortium stood the test of time and proceeded unrestricted to their respective expirations; some of the patents were even extended once or twice by the Patent Commissioner, who at his discretion could extend the patent protection if he believed the inventor had not yet attained reward equal to the economic value of their contribution.⁷³ Judge Sprague in his 1854 decision clearly upheld the validity of the pool's cornerstone Howe patent—and this was one of the primary reasons the “Combination,” including Howe's needle-shuttle patent, was so urgently needed by Howe's competitors. The validity of the patents in the pool is also supported by the sheer number of other patents for sewing machine models (over 500) and improvements (reportedly large but unknown number) that were issued during the years of the Combination's operation. The volume of efforts to “design around” the patents in the pool would certainly be a secondary consideration in an obviousness determination, which is critical for validity.⁷⁴ From all the information available, it appears that the sewing machine combination would satisfy the Justice Department's first guideline for protecting innovation.

A second parameter required by the DOJ is that licenses granted are non-exclusive to pool members. The sewing machine Combination licenses were reportedly required by anyone, including the patent holders, interested in selling a machine using one, some, or all of the patents in the pool. The issued licenses were non-exclusive to all manufacturers, and each company continued to improve their respective machine without pooling interests. The

⁷⁰ THE STORY OF THE SEWING-MACHINE; Its Invention Improvements Social, Industrial and Commercial Importance, New York Times (Jan 7, 1860), available at <https://www.nytimes.com/1860/01/07/archives/the-story-of-the-sewingmachine-its-invention-improvements-social.html>.

⁷¹ Ryan L. Lampe and Petra Moser, (2009), “Do Patent Pools Encourage Innovation? Evidence from the 19th-Century Sewing Machine Industry,” NBER Working Paper No. 15061, available at <http://www.nber.org/papers/w15061.pdf>.

⁷² Author's research, based on Grace Rogers Cooper data in *The Sewing Machine: Its Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁷³ Id.

⁷⁴ See *Graham et al. v. John Deere Co. of Kansas City et al.*, (1966), 383 U.S. 1; 86 S. Ct. 684; 15 L. Ed. 2d 545; 148 U.S.P.Q. (BNA) 459.

advantage for innovation in the non-exclusive license is, according to the DOJ, is a lessened restriction on the licensors, who are free to explore other markets and promote their own invention. Clearly there was economic advantage in this licensing arrangement to the sewing machine pool members. Also, innovative efforts appeared to continue as Singer, Howe, Grover, Baker, Wheeler, and Wilson focused on changes that would cause their machines to “stand out” amidst the competition of manufacturers within and outside of the Combination.

A third requirement of the Department of Justice relates to the issue of grantbacks. The grantback in the case of the sewing machine pool would require licensees to provide the licensor with rights to improvements in the machines, so as to avoid “hold-up,” where it is difficult to obtain permission to use the improvement, or “double marginalization,” where two or more licensing fees are required—both these issues can potentially slow innovation. There were no apparent grantback provisions in the sewing machine Combination, and pool members tended to focus on their own machines, seemingly oblivious to improvements designed by other consortium manufacturers, or by inventors outside the pool. It does not appear that any new patents were added to the pool after the initial group in 1856, although improvements were assuredly developed in the twenty years of the Combination’s operation. The Howe patent was renewed in 1860 for a period of seven years, and this carried the pool until 1867. When the Howe patent expired, Elias Howe left the consortium, and the other pool members relied on the Bachelder patent, which was extended twice by the Patent Commissioner, until it also expired in 1877.⁷⁵ It may be that the primary operation of the sewing machine was adequately covered by the patents in the pool, such as that of Howe and Bachelder, and therefore the minor improvements made to the inventions did not contribute to the problems the grantback provision is designed to prevent. However, it is not known with certainty if the absence of grantbacks would have promoted or deterred innovation in this instance—there is no information of record that would support either conclusion.

The Department’s final requirement for determining a pool’s impact on innovation is a clear delineation of what patents belong to the pool. In the case of the sewing machine consortium the patents were stated precisely—this was a critical step for pool members intent on avoiding infringement litigation. The record does show that this knowledge of the patents in the sewing machine pool reduced infringement (especially between pool members), and thousands of patents were issued for sewing machines and improvements which were considered to be novel and non-obvious in light of the Howe, Singer, Bachelder, Morey & Johnson, Wilson, Grover, and Baker patents available through the consortium.⁷⁶ The record also demonstrates that the patents specified in the pool were complementary, and not substitutes (directly competing), which is also a concern of the DOJ.

The information available for the sewing machine “Combination” suggests that the pool would likely be considered by the DOJ as not hindering innovation. The merging of strong, clearly delineated, valid patents in the consortium with only mildly restrictive licensing terms would tend to encourage innovation in the inventions’ field. As far as anti-trust considerations are concerned, it is difficult to determine how a court would have viewed the Combination. The first litigation and court decisions on the anti-competitive effects of patent pools were considered in the early twentieth century—about thirty years after the sewing machine pool ended. A rudimentary application of Richard J. Gilbert’s “Competitive Hazard Scoring” system would place the Combination with a low score of “2” due only to the presence of complementary patents and restrictions on unilateral licensing.⁷⁷

⁷⁵ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

⁷⁶ Id.

⁷⁷ Gilbert, Richard J., (2002), “Antitrust for Patent Pools: A Century of Policy Evolution,” *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

The patents in the Combination were likely also blocking, as one of the primary reasons for the consortium was the inability for manufacturers to move forward without infringing on another patent. Yet there is no evidence that the other factors considered by Gilbert were present: the patents in the pool were strong as opposed to weak, there was no apparent attempt by the group at vertical restraints, nor evidence of attempts to restrict alternative products or processes. Although there is also no evidence of the requirement of a joint defense of patents in the pool, either in the literature or through a reading of related court decisions, some of each royalty payment was set aside for the Combination's litigation costs. Orlando B. Potter, President of Grover & Baker and a Combination member, was also an attorney, and he may have been available to represent consortium patent holders (as was his practice for his own company prior to 1856), yet this would poorly qualify as a joint defense *requirement* of pool members. The restriction against unilateral licensing was better outlined in the pool's history; records of the consortium report the required consent of all Combination members prior to licensing, and Gilbert believes this may make license negotiations more difficult, and he therefore assigns a hazard score value of "1" to this factor. For the sewing machine patent pool, the presence of complementary (non-competing) patents, with a hazard score value of "1" together with restrictions on unilateral licensing, also with a hazard value of "1" results in a total score of "2" for the consortium. Gilbert noted that the average score for the valid pools in his study was 2.6, and this would place the sewing machine pool well within that collection. Of the eight patent pools examined by Gilbert that demonstrated scores of "2" or less, only two were denied by the court as in violation of antitrust laws.⁷⁸

Ironically, one of the denied patent pooling arrangements identified by Gilbert as showing a competitive hazard score of "2" was that of the I.M. Singer Manufacturing Co. and two foreign companies, decided in 1963. Singer had aligned itself with two European manufacturers in a cross-licensing and joint defense agreement that attempted to eliminate Japanese competitors in the multicam zigzag sewing machine market. The Supreme Court determined that this "identity of purpose" was a violation of the Sherman Act and Singer was liable; this concerted action to limit foreign competition was denied by the Court and the pool disbanded.⁷⁹ ⁸⁰ The 1963 pool, like the 1856 Combination, held complementary patents, but it was the clearly restrictive joint defense agreement which greatly disturbed the Court.

The Sewing Machine Combination, according to all available evidence, does not appear to be oppressive to innovation or violative of antitrust securities, as measured by modern parameters. Researchers Josh Lerner and Jean Tirole in their study *Efficient Patent Pools* (2004) postulate that inventors enter a patent pool to increase their profit, so therefore the "prospect of a pool raises individual profit and thereby encourages innovation."⁸¹ It is difficult to gauge whether the *prospect* of the sewing machine pool encouraged innovation, yet the principle members clearly formed the pool for the profit incentive; the "Combination" reduced litigation, allowed cross-licensing and increased production with the savings and earnings that resulted. The ex post perspective suggests that the pool's existence encouraged innovation—as evidenced by the vast number of sewing machine patents issued during the Combination's tenure. An application of the Department of Justice's guidelines for determining a pool's potential impact on innovation, which shifts from the traditional ex post observations to an ex ante approach, appears to suggest that modernly the Combination of 1856 would receive a favorable business review. Additionally, examination of the Combination by Gilbert's

⁷⁸ Id.

⁷⁹ See *United States v. Singer Manufacturing*, (1963), 374 U.S. 174.

⁸⁰ Gilbert, Richard J., (2002), "Antitrust for Patent Pools: A Century of Policy Evolution," *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

⁸¹ Lerner, Josh, and Jean Tirole, (2004), "Efficient Patent Pools," Working Paper 9175, National Bureau of Economic Research, available at <http://www.nber.org/papers/w9175>

“Competitive Hazard” analysis would provide the pool with a 75% chance of court approval, based on similar cases.⁸²

The legacy begun by Potter, Howe, Wilson and Singer in the 1856 patent pool was to evolve through the next century as both a solution and a detriment to the American economy. Inventors emboldened with patent protection sought to combine their issues to increase their own protection or minimize competition. It was the latter action that would cause many patent pools to enter the court system and contribute to the rigorous evaluative systems in place today.

B. The Motion Picture Patents Company

On Saturday, April 14th, 1894, the first Kinetoscope parlor opened on Broadway in New York City. Patrons paid twenty-five cents to view five films, each lasting less than a minute, on the noble patented invention of Thomas Alva Edison. Edison was a prodigious creator of film equipment (199 patents in the field); his work included not only this first movie projector, but also the kinetophone (synchronizing sound and film), projectoscope (eventually incorporating a reel system) and multiple enlightened improvements. The Edison laboratory, a bustling West Orange, New Jersey center staffed by laboratory assistants, inventors and engineers, took the “kernels” of patentable ideas and reduced them to practice, with and without the Father of Invention’s guidance. Any substance emerging, however, from the Edison “collaborations” was routinely tagged with his hallmark—for an Edison invention was a marketable invention. It is estimated that between April 1894 and February 1895 alone, Edison saw sales of the kinetoscope totaling over \$150,000. Commercial success brought complications to the Edison camp, however, primarily in the not-unexpected form of imitation and subsequent patent litigation. Edison claimed infringement against a host of competitors, such as the small film companies Lubin, Selig, Vitagraph and Essanay. Litigation, as it had with the pre-sewing machine patent pool founders, began to increasingly occupy Edison’s time and finances. He was also meeting with limited success; when a major competitor, the Biograph company, prevailed in a decision regarding a camera patent, Edison began to consider alternatives to the courthouse.⁸³ Three of the major film patent holders—companies Edison, Biograph and Armat—were encouraged by industry leaders of the time to form a patent pool or trade association by which they could license their inventions to others. Unfortunately Edison and Biograph representatives disagreed on the relative importance of their respective patents, and instead of developing a consortium, split into two rival groups.⁸⁴

The failed negotiation with Biograph and ongoing courtroom activities encouraged Edison to create a licensing body—the Association of Edison Licensees—on March 1, 1908.⁸⁵ ⁸⁶ The Association granted licenses to producers, exchanges and exhibitors for materials based on Edison patents, with the hopes that litigation would ease and competition be eliminated. The group included many of the film companies Edison had formally sued, or was presently suing, including Vitagraph, Selig, Lubin, Pathe, Melies, Essanay and Kalern. The Biograph Company developed its own licensing association that included Biograph’s patents and two foreign film companies—Cines and Great Northern Film Company—as well as two American importers of

⁸² Author’s research, based on Richard J. Gilbert’s work in “Antitrust for Patent Pools: A Century of Policy Evolution”, *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

⁸³ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ See “History of Edison Motion Pictures,” available at <https://www.thoughtco.com/history-of-motion-picture-4082865>

foreign films: Williams, Brown, and Earle; and Kleine Optical Company.⁸⁷

For about eight months the Edison and Biograph groups clamored for territory in the rapidly evolving motion picture industry. Both companies quickly learned, however, that their commercial warfare was disadvantageous for all the organizations involved. Based upon this realization, Edison and Biograph came together in early September, 1908, to incorporate the “Motion Picture Patents Company” (MPPC). MPPC, also known as the “First Oligopoly,” included all the major film companies (Edison, Biograph, Vitagraph, Essanay, Selig, Lubin, Kalem, American Star, and American Pathe), the leading distributor of the day (Kleine), and the biggest supplier of raw film (Eastman Kodak).⁸⁸ The Edison Papers, organized by Rutgers University, record the initial structure of the patent consortium: “Frank L. Dyer, vice president of the Edison Manufacturing Company and later president of Thomas A. Edison, Inc., was the founding president. Harry N. Marvin, president of the American Mutoscope & Biograph Company (Biograph), served as vice president. George F. Scull, assistant to the vice president of the Edison Manufacturing Company, was secretary. MPPC began operations on December 8, 1908, and acquired sixteen patents intrinsic to the manufacture and projection of motion pictures. Most of these patents were previously controlled by the Edison Manufacturing Company and the American Mutoscope & Biograph Company. MPPC subsequently entered into price, royalty, licensing, and related agreements with additional producers, importers, rental exchanges, exhibitors, and manufacturers...”⁸⁹ At its formation, the MPPC patent pool consisted of a total of sixteen patents, the majority held by Edison. Ten of the patents were thought to be of minor importance—almost irrelevant to the operation of the consortium. Of the core six patents, three related to projecting machines, one to film, one to cameras, and one to the “Latham loop.”⁹⁰ The Latham loop was an especially important invention patent, applied for on June 1st, 1895, by Woodville Latham. In the application Latham describes his device as having “feeding mechanisms located between the devices for supporting the film and separate and distinct there from, one of said feeding mechanisms being constructed to uniformly feed the film and produce a predetermined supply of slack.”⁹¹ The problem which spurred Latham to invent was reported to be two-fold: “first, he wanted to invent a camera that would be able to film an entire sequence of events on one strip of film; and second, he wanted to design a projector that could clearly show that entire [sequence] on a large screen.”⁹² The first problem was an especially difficult, “because the cameras at this time (Edison’s Kinetographs), tended to tear the perforations of the film if the film was more than 100 feet long. This was due to the fact that the spool that fed the film to the camera, and the spool that took up the film, were in constant motion, while the film at the camera’s film gate had to pause for a fraction of a second so that the shutter could expose each frame to a light source. This pause produced an intermittent, jerky movement that put a great deal of strain on the film, and the longer the film the greater the strain.”⁹³ Through experimentation, Latham and his associates added “a loop of film to the film’s path that could absorb the effects of the intermittent movement by expanding and contracting.” Such a mechanism enabled “life-size” projection of images on a screen, where more than one viewer at a time could be accommodated, and longer, more continuous films. The Latham invention combined with several of Edison’s patents was the true substance

⁸⁷ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

⁸⁸ Available at www.wikipedia.org

⁸⁹ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

⁹⁰ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

⁹¹ Henry Giardina, *The Latham Loop: The Camera Technology that Turned Films into Stories*, The Atlantic (Jan 11, 2017), available at <https://www.theatlantic.com/technology/archive/2017/01/latham-loop/512687/>.

⁹² Id.

⁹³ Id.

of the consortium; and these issues were the leverage MPPC would use against industry competitors.⁹⁴

MPPC set a deadline of January, 1909 for all companies using patented material from the pool to become licensed. In February of the same year, unlicensed producers, distributors and exhibitors organized into their own group—referred to initially as the “Independents” and later as the “Second Oligopoly”—and absolutely refused to submit to the demands of the MPPC.⁹⁵

Edison intended for the patent consortium to act, as pointed out by the Court in *United States v. Motion Picture Patent Company* (1915) 225 Fed. 800, “as one man might have acted.” An antitrust suit was filed against MPPC by the federal government on August 15, 1912, in the U.S. District Court for the Eastern District of Pennsylvania. District Judge Dickinson noted in his 1915 decision that “Lists of exchanges and of theaters were prepared, and no exchange was permitted to have films, and no theater to exhibit them, unless with the consent of all of the defendants. The names of none appeared upon this list except such as bought all supplies from the defendants, and any who dealt otherwise were dropped. Every theater was required to pay a royalty for the use of a projecting machine, even when the machine had been owned by the exhibitor before the combination was formed. The films passed into the possession of exchanges and exhibitors under an agreement which enabled the defendants to recall them at will.”⁹⁶ The federal suit arose primarily out of an additional company MPPC organized to address the formation of the independent movement—a “strong-arm” subsidiary named the *General Film Company*.⁹⁷ General Film assailed the Independents with a vengeance, and trawled the countryside confiscating unlicensed equipment, discontinuing product supplies to theaters, and vigorously controlling distribution.⁹⁸

Yet by the time Judge Dickinson decided the government’s antitrust case and ordered the dissolution of MPPC, the Independents had already outmaneuvered Edison’s group. It was this “outlaw” precursor of the Hollywood film studios that demonstrated in the case of the Motion Picture Patents Company, innovation might actually be stymied by the formation of a patent consortium. Individuals of the Independents group protesting Edison’s patent pool included film producers such as William Fox (Fox Film Corporation), Carl Laemmle (Independent Motion Picture Company), Harry E. Aitken (Majestic Films) and Adolph Zukor (Famous Players). These filmmakers would later give birth to now famous studios such as Twentieth Century Fox (Fox), Universal Pictures (Laemmle), Paramount Pictures (Zukor) and Metro-Goldwyn-Mayer (evolved from some of Aitken’s property).⁹⁹ One of the first significant moves by the Independents was to relocate their operations to the West—far away from Edison’s New Jersey laboratory and potentially out of MPPC and General Film Company reach. Independent group film makers found that a west coast location was ideal for making a quick escape into Mexico, days ahead of Edison eastern agents. They selected as their base the city of Hollywood, California, where a few other film producers—ironically among them, D.W. Griffith of the Biograph Company (an MPPC member)—had already filmed successfully. The Hollywood location was idyllic for a year-round shooting schedule, and the Independents were therefore able to produce a greater number of films on a more efficient budget. The California natural light quality was also perfect for exposing film medium, and the

⁹⁴ *Id.*

⁹⁵ See “The Edison Movie Monopoly,” (2005), *Hollywood Renegades Archive*, The Society of Independent Motion Picture Producers Research Database, available at https://www.cobbles.com/simpp_archive/edison_trust.htm.

⁹⁶ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

⁹⁷ See “The Edison Movie Monopoly,” (2005), *Hollywood Renegades Archive*, The Society of Independent Motion Picture Producers Research Database, available at https://www.cobbles.com/simpp_archive/edison_trust.htm.

⁹⁸ *Id.*

⁹⁹ Available at https://en.wikipedia.org/wiki/Motion_Picture_Patents_Company

local scenery highly conducive to a variety of film storylines. The Independents additionally evolved the full-length feature film, while the MPPC consortium continued to cling to the short-film format that had been so successful for Edison. Historians also point out that the Independents worked strategically to bestow their stock actors with “star power,” while the Edison group resisted promoting their own film employees.¹⁰⁰

Although it appears that a number of these innovations actually originated with Edison and the MPPC, it was the Second Oligopoly that capitalized upon them, bringing an end to the Edison trust even before the courts condemned the monopoly.

While a more difficult examination than the sewing machine Combination, it is possible to evaluate the Edison Trust through the Department of Justice guidelines for restricting innovation. Recall that the DOJ’s initial step involves checking to determine that all the patents licensed by the pool are both valid and preferably complementary. Examining the validity of all the patents in the MPPC is problematic because, according to researchers of The Edison Papers Collection at Rutgers University, there does not appear to be an available comprehensive list of the patents in the pool.¹⁰¹ It is clear, however, that the Edison patents as well as the Latham patent and Biograph patent within the consortium survived until their respective expirations; the Biograph patent even remained valid despite a number of challenges by Edison himself. The primary known patents in the pool also appear to be complementary, and not substitutes that would compete directly with each other. Evidence for the latter includes reports of the initial impetus to form the trust—hope for a reduction in infringement amongst pool members—reminiscent of the intent behind the Sewing Machine Combination. Other patents in the pool, although not described in the literature, are reported by the Court in *United States v. Motion Picture Patent Company* (1915) as being of only “minor importance.”¹⁰² These obscure patents cannot therefore be classified as complementary or substitutes, and their validity during their issue terms is also unknown.

A second DOJ element requires that licenses granted are non-exclusive to pool members. The DOJ believes that innovation is less restricted when the licensors are free to seek promotion for their inventions outside the pool boundaries. In the MPPC, all the members were both licensors and licensees of the technology in the pool.¹⁰³ It appears that licensees outside the pool were only permitted with the consent of all members, which would suggest one of the more restrictive licensing arrangements traditionally frowned upon by the courts and DOJ authorities. There is additional evidence that the numbers of licensees in some areas regulated by the pool—specifically distribution, for example—eroded significantly after the MPPC formed. Judge Dickinson recounts in his 1915 decision against MMPC that although Edison’s group licensed 116 “jobbers” at the start of the pool, a few years later there was only a single distributor—the General Film Company—owned and operated by MPPC. The level of trade restriction was clear to the Judge, who observed “how effective and thorough were the methods [of MPPC]...” as evidenced by “...the fact that, of the 116, there is left one solitary survivor.”¹⁰⁴ As previously mentioned, Judge Dickinson also suggests in his opinion that the MPPC planned on operating as a single entity, as members of the pool essentially had an “agreement to act as one man might have acted.”¹⁰⁵ It appears then from the information available that the licensing terms used by the Edison pool were considerably more restrictive,

¹⁰⁰ See “The Edison Movie Monopoly,” (2005), *Hollywood Renegades Archive*, The Society of Independent Motion Picture Producers Research Database, available at https://www.cobbles.com/simpp_archive/edison_trust.htm.

¹⁰¹ E-mail correspondence between Author and Curators at Rutgers University, The Thomas A. Edison Papers.

¹⁰² See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹⁰³ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

¹⁰⁴ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹⁰⁵ *Id.*

both to the licensors and licensees, than would be acceptable to the Department of Justice under current guidelines.

A third requirement of the DOJ concerns the issue of grantbacks. A grantback in the case of the MPPC would allow the licensors within the pool to benefit from advancements developed either by licensees or fellow licensors. Existing records suggest that grantbacks were not even considered by MPPC members. The majority of MPPC licensees were film exchanges, exhibitors, and theaters, all of which were unlikely to make improvements in the inventions licensed to them. There also does not appear to be any evidence that any additional patents or patented improvements were added to the original sixteen issues within the pool. Although Edison patented several hundred inventions during the years 1908 and 1916, when the MPPC was fully operational, the majority of the patents were for advancements on phonographs, cement, and batteries—not film, cameras, or movie projectors. Additionally the fact that the motion picture industry was only a minor portion of the Edison Empire—Edison was involved with over one hundred other companies and corporations simultaneously with MPPC operations—suggests that few, if any, improvements were returned to the pool.¹⁰⁶ It is also unlikely that changes and advancements made by the west coast independents would have been shared with the Edison Trust, considering the acrimonious stand-off between these factions.

The final requirement in the Department of Justice Guidelines calls for clarity in the description of those patents included in the pool. In the case of the MPPC patent pool, while District Judge Dickinson makes brief mention of the number of the patents in the consortium and one issue by name (Latham Loop), there is no complete description of the included patents currently known.¹⁰⁷ Researchers of The Edison Papers Project at Rutgers University have not come across such a list in their continuing examination of over five million pages of Edison documents, and this may be additional evidence that the patents in the pool were either poorly or not described, even during the MPPC's operational years.¹⁰⁸ Without clear knowledge of the patents in the pool, future innovators are restricted in their development of non-infringing technologies, increasing litigation and slowing the rate of improvement and production.¹⁰⁹

Therefore the fact that the patents in the MPPC pool are largely unknown, possibly some potentially invalid, and that licensing was largely restrictive, it is doubtful that the MPPC patent pool would have passed DOJ scrutiny under the 1995 Guidelines. And although historians believe that the “independents” innovated despite an attempt by the Edison Trust to monopolize advancements in the motion picture industry, such a finding is irrelevant to a DOJ determination that the MPPC consortium possessed the organizational infrastructure to hinder innovation.

The fact that the MPPC pool was apparently “hard-wired” to collusive behavior in other respects may also affect innovation safeguards. The drive to monopolize all aspects of the industry was an attempt to shelter the patent rights of the major inventions in the pool and “close-out” the market to other inventors. By controlling every faction of the motion picture practice—invention, licensing, distribution—the MPPC hoped to control all innovative efforts in the field as well. As Judge Dickinson pointed out in his *U.S. v. MPPC* decision, there exists no issue with the pooling of patent owners and patent rights for “joint or common protection.” Problems arise, however, when the combination intends to not only protect patent rights, but to also monopolize all other rights pertaining to the trade in question. The Judge states that

¹⁰⁶ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

¹⁰⁷ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹⁰⁸ E-mail correspondence between Author and Curators at Rutgers University, The Thomas A. Edison Papers.

¹⁰⁹ Marshall, Frances, (2006), “Patent Pools: Perspectives on Enforcement,” Practising Law Institute, *Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series*, PLI Order No. 8816.

“while the owner of a patent on a plow...may join with the owners of patents...[on] other parts of the plow” and this may incidentally result in a semi-corner on the market in plows, it is not acceptable for a combination between “the owners of patented plows, patented harrows, patented reapers and binders, and other implements of husbandry, and the large dealers in this implements, who are not owners of the patents,” when the intent of the combination is controlling the entire trade.¹¹⁰ In the MPPC, Judge Dickinson concluded that “it requires no prophetic vision to foresee that the ultimate result [of the MPPC domination] would be that no play would be written, or dramatically enacted, except by authors and artists favored by the defendants.”¹¹¹ The Judge’s suggestion was, in essence, that such a monopoly would not only be an unallowable extension of patent rights, but a mar on innovation and expression in a newly developing and growing industry.

In examining the MPPC consortium in light of Richard Gilbert’s “Competitive Hazard Scoring” system, issues similar to those seen with the Sewing Machine Combination arise. There is scanty or incomplete information on many aspects of the MPPC consortium, even more so than the earlier Combination, where significantly greater knowledge existed of the sewing machine patents in the pool. What is known about the MPPC, however, strongly suggests that the Edison Trust could score on the hazard scale in at least the following areas: imposition of exclusive territories (+2), restriction on the use of alternate products (+2), and prevention of unilateral licensing (+1). There is also the possibility that the Latham patent, and/or the Biograph patent, were one-way blocking with Edison’s kinetoscope patent(s) in the pool. It appears that especially the Latham patent greatly improved the Edison machine, allowing advancements that would have otherwise been potentially unavailable to MPPC. Complementary patents (one-way blocking) receive a score of +1 on the Gilbert scale. It is not known if there were weak patents in the pool protected by the consortium—pooling such patents tends to exclude competition that would have otherwise occurred without the pool.¹¹² It is fairly well established through the court record that the MPPC restricted the licensing terms of patents in the pool to include exclusive arrangements and territories—licensees who failed to observe the terms were “dropped” from any association with the Trust. Unilateral licensing was not allowed and the consent of all pool members was required before a license was granted. The MPPC required all supplies/materials/equipment be purchased or licensed from them or their subsidiaries; if an alternate supplier/licensor was utilized by a licensee, all business with the latter was terminated. It is also likely that there was joint royalty setting among the pool participants, yet as the major patents in the pool appear to be complementary, and not substitutes, this would probably not be an important competitive factor. The known factors in the MPPC case would provide the pool with an approximate competitive hazard score of “6” and a likeliness that the pool would be denied in a court challenge. Of the 22 pools analyzed by Gilbert through competitive hazard scoring, only one with a score above “5”—*Bement v. National Harrow*—was approved by the courts. The MPPC case shares many of the same factors seen in the *Standard Sanitary Manufacturing v. U.S.* (1912) litigation—including complementary patents, imposition of exclusive territories, restriction on the use of alternate products and processes, the prevention of unilateral licensing, as well as a denial by the considering court. *Standard Sanitary* was decided a few years before the MPPC case and is considered a pivotal determination by the Supreme Court in the application of antitrust principles. While *Standard Sanitary* and *MPPC* share similar factors and a hazard score of “6” in a Gilbert analysis, a comparison of the court opinions suggest that the actions of the MPPC are regarded as considerably more egregious, in both intent and result, than the antitrust

¹¹⁰ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹¹¹ *Id.*

¹¹² Gilbert, Richard J., (2002), “Antitrust for Patent Pools: A Century of Policy Evolution,” *Stan. Tech. L. Rev.*, available at http://stlr.stanford.edu/STLR/Core_Page/.

violations of *Standard Sanitary*.^{113 114}

It then appears that a retroactive examination of the Motion Picture Patents Company consortium places this pool among those not likely to pass the Department of Justice's innovation test scrutiny. The Edison Trust, unlike the Sewing Machine Combination, would be considered oppressive to innovative efforts outside the pool, as evidenced by the poor descriptions of included patents, intensely restrictive and exclusive licensing, and the potential presence of weak, irrelevant, or invalid patents. MPPC's denial by the Court also demonstrates that anti-competitive factors and potential innovation obstacles were clearly evident in the pool infrastructure. While the MPPC contended to the Dickinson Court that their intent in forming the consortium was to "end contests which hampered the development of the art" and to move the motion picture industry forward by "improving the character of the shows, both in the artistic merits and the mechanical perfection of the display," their conduct in the pool was wholly to the contrary. The MPPC and the General Film Company failed to clarify what patents were present in the pool, which could only lead to increased infringement and litigation. And by monopolizing the entire industry, MPPC had the opposite effect of improving either the presentation or production of films during their operation. As Judge Dickinson noted, the proposed initial "intent" of the Trust—to both protect pool members' patent rights and spur innovation—rapidly deteriorated into a patent control situation, thoroughly hindering innovative efforts.¹¹⁵

The effect on innovation then, as seen by the examples of the Sewing Machine Combination and the Edison Trust (MPPC), appears to be tied less closely to the intent for organizing the pool, and more closely affiliated with the *actual operation* of the pool after formation. Both the sewing machine and motion picture patent pools originally formed to offset the rigors of infringement litigation and clear a path for innovation in the respective inventions of the pools. Later, at least in the MPPC, this initial motivation became overshadowed by competing, contrary, and unrelated interests. For the reason of changing intent, and because the DOJ Guidelines utilize an *ex ante* approach to estimate the effect of a pool on innovation in the respective field, the Department has recognized the importance of periodically evaluating pools by re-examining these or other factors to insure these safeguards remain viable.

IV. MODERN PATENT POOLS AND THE INCENTIVE TO INVENT

On June 26, 1997 the Department of Justice approved a patent pool formed around MPEG-2 technology. The MPEG-2 standard comprised a video compression system that combined audio and video into a single bitstream and reduced the data required in the presentation of generated video sequences. The use of MPEG-2 technology by some corporations and patent holders would have potentially infringed numerous patents in the area of video transmission and subsequently interfered with implementation of this valuable technology. Corporations with an interest in MPEG-2 and possessing relevant patents sought to combine their issues in a "portfolio" with administration by a single licensing body. With the intent of diminishing the specter of infringement and boosting the prospect of simplified licensing/increased royalties, nine corporations/patent holders and their affiliates requested a DOJ evaluation for antitrust implications of an MPEG-2 patent pool.

Acting Assistant Attorney General Joel I. Klein¹¹⁶ noted in the MPEG-2 response that the DOJ believed a patent pool "may provide competitive benefits by integrating complementary technologies, reducing transaction costs, clearing blocking positions, and

¹¹³ See *Standard Sanitary Manufacturing v. United States*, (1912), 226 U.S. 20.

¹¹⁴ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹¹⁵ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹¹⁶ As of May, 2018, Mr. Klein serves as chief of staff for the publically traded company News Corp.

avoiding costly infringement litigation.”¹¹⁷ Yet Klein also wrote of the Department’s concerns that patent pools, depending on their structure, may conversely restrict competition and discourage innovation. The Attorney General set out the guidelines for determining the acceptability of a potential pool, including: (1) validity of patents in the pool, (2) the presence of substitute patents, (3) favorable licensing and grantbacks, and (4) clear delineation of patents included in the pool.¹¹⁸ Through an examination of these parameters, Mr. Klein and the DOJ did not find that the proposed MPEG-2 consortium would pose any anticompetitive restraint upon innovative efforts, either within or outside of the pool. The MPEG-2 pool was to be built around a cluster of 27 *Essential Patents*, all complementary and currently valid. *Essential Patents* are those issues that are believed to be, by identifying authorities, necessary to implementation of the standard and critical to operation of the pool. Portfolio licensees would be provided with a comprehensive list of essential patents in the pool. The licensing terms and arrangements, which were to be administered by an independent third party, were considered to be equitable. The scope of the pool’s grantback clause was limited to essential patents and required licensees to provide improvements on a non-exclusive basis, eliminating “hold-up” and other patent thicket issues.¹¹⁹

The only innovation issue that appeared to give Mr. Klein pause was a concern over a “partial termination” clause in the MPEG-2 Licensing Agreement. The clause provided that if a licensee sues a licensor for infringement of an Essential Patent or Related Patent and refuses to grant a license on the allegedly infringed patent on “fair and reasonable terms,” the licensor’s patent or patents may be withdrawn from the licensee’s portfolio—a “partial termination.” Such a partial termination would “force the licensee to negotiate with the licensor as if the pool had never existed.” The partial termination right could potentially “dampen licensees’ incentives to invest in research and development of MPEG-2 implementations, undercutting somewhat the benefits of the openness of the MPEG-2 standard.”¹²⁰ The DOJ, however, reconciled this problem by differentiating between licensees holding Essential Patents, or those that are critical to compliance with the MPEG-2 standard, and Related Patents, that are non-essential. Licensees holding Essential Patents are required through the grantback clause to make their issue available to all on a fair and reasonable basis, so if they are the subjects of an elective partial termination, they are also violating the grantback provision. The DOJ therefore believed that there were sufficient pro-competitive protections in place for Essential Patent holders, and innovation would not be greatly impacted. When the licensee holds a Related Patent, however, the situation is more serious and complex. If a licensor decides to infringe a Related Patent after being refused a license, and the licensee sues for the infringement, that licensee may be unable to comply with the MPEG-2 standard because of partial termination. The DOJ states that the licensors will likely use the partial termination right judiciously, however, because doing so would diminish Related Patents and the overall value of the portfolio. The Department therefore found on balance the partial termination clause to be significantly pro-competitive and posed limited potential harm to the licensees’ incentives to invent.¹²¹

Due to the safeguards developed by the Department of Justice, most authorities feel the

¹¹⁷ U.S. Dep’t of Justice & Federal Trade Comm’n, *Antitrust Guidelines for the Licensing of Intellectual Property* (1995, 2017), <https://www.justice.gov/atr/IPguidelines/download>.

¹¹⁸ See Business Review Letter from Joel I. Klein, Acting Assistant Attorney General, to Gerrard R. Beeney, Esq. (June 26, 1997) regarding MPEG-2 technology, available at https://www.law.berkeley.edu/files/MPEG2_Business_Review_Letter.pdf.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ See Business Review Letter from Joel I. Klein, Acting Assistant Attorney General, to Gerrard R. Beeney, Esq. (June 26, 1997) regarding MPEG-2 technology, available at https://www.law.berkeley.edu/files/MPEG2_Business_Review_Letter.pdf.

patent pool, especially those relating to standard bodies, are both essential and beneficial. Many opinions have voiced in favor of the contemporary pool, at least when certain criteria are present. Some of the requirements of the modern patent consortium are reminiscent of historic pools like the Sewing Machine Combination, while others are unique to the refinements and advances of twentieth and twenty-first century technology and legal opinion. Important elements of current pools, instituted to protect both competition and innovation, have evolved from the DOJ guidelines to include: (1) A technology standard that is well-defined; (2) An additionally well-defined group of Essential Patent holders; (3) A “fair and reasonable” licensing arrangement, and non-exclusive licensing permission; and (4) An independent third party administrator.¹²²

When a defined standard exists, such as the MPEG-2, DVD technology (the latter of which twice received a favorable DOJ review), or the 3G Patent Platform for Third Generation Mobile Communication Systems (reviewed in 2012),¹²³ many experts believe the organization of a patent pool around that standard is particularly useful.¹²⁴ Standards are increasingly important for technological interoperability, and are therefore frequently seen in fields such as communications, computers, and electronics. Of the historical patent pools examined, the sewing machine patent pool is the closest to a defined modern understanding of “standard.” Yet even the sewing machine patents were not truly essential to the production or use of sewing machines—there were no critical interoperability issues native to operation or application of the technology. Nor were the kinoscope, film and movie projector patents of the MPPC absolutely essential to early twentieth century production and film viewing. Yet unlike historical consortiums, there does not appear to be any modern patent pools reviewed and approved by the DOJ that do not involve some type of industry standard /standard-setting body.^{125 126}

In addition to a well-defined standard, modern pools that protect innovation include well-described *Essential Patents* in the consortium. The inclusion of only Essential Patents in the pool tends to prevent anti-competitive risk; substitutes are thereby excluded and only complementary issues—those that do not directly compete—compose the pool. The approved MPEG-2 pool and DVD pools (one DVD pool to Sony, Pioneer and Philips, approved in December 1998; one DVD pool to Toshiba, Hitachi, Matsushita, Mitsubishi, Time Warner, and Victor, approved in June 1999) were carefully evaluated by the DOJ with regard to Essential Patents. The Department even recommends that the patent holders hire an expert to identify these vital patents to ensure compliance with the Guidelines.¹²⁷ In the historical sewing machine and movie patent pools, the Essential Patent equivalents were selected by a number of factors, including market forces, blocking issues, and rudimentary “experts” in the form of industry leaders and/or the patent holders themselves. Modernly there would most certainly be greater restrictions on the selection of patents for these consortiums, yet this requirement may

¹²² See “Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property,” by James J. Kulbaski, Esq. (January, 2002).

¹²³ Business Review Letter from Charles A. James, Assistant Att’y Gen., U.S. Dep’t of Justice, to Ky P. Ewing, Esq. (November 12, 2002), available at <http://www.usdoj.gov/atr/public/busreview/200455.pdf>.

¹²⁴ See “Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property,” by James J. Kulbaski, Esq. (January, 2002).

¹²⁵ Id.

¹²⁶ See “Keynote Address at the Leadership Conference on IP, Antitrust, and Innovation Policy,” by Assistant Attorney General Makan Delrahim, (April, 2018), available at <https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-keynote-address-leadership-conference>.

¹²⁷ See Business Review Letter from Joel I. Klein, Acting Assistant Attorney General, to Gerrard R. Beeney, Esq. (June 26, 1997) regarding MPEG-2 technology, available at https://www.law.berkeley.edu/files/MPEG2_Business_Review_Letter.pdf.

have more relevance for present-day pools in light of patent thickets and intense, complex economic structures.

A “fair and reasonable” licensing standard is another hallmark of the DOJ approved modern patent pool. Licensing of the MPEG-2 technology by administrator MPEG LA, LLC was offered as world-wide, non-exclusive, and non-sublicensable.¹²⁸ It is believed the Sewing Machine Combination provided non-exclusive licensing permission to its patent holders, yet this is not likely the case in the Motion Picture Patents Company arrangements. The latter focused more on the control of the industry, however, and the sewing machine magnates appeared to have greater interest in production and the subsequent royalties generated, which is a directive aligned with non-exclusivity.

The MPEG-2 pool also established grantback clauses for licensees who hold Essential Patents, and the Department views the instituted grantbacks as both fair and reasonable to both the licensee and receiving licensor. In the historic patent pools, there is no evidence that grantback clauses were applied or even considered. While the Sewing Machine Combination witnessed considerable improvement of the basic machine over twenty years of operation, there is no evidence that any issues were returned to the pool, although it is fairly certain that pool licensees made patentable improvements on the licensed machines. Once again modernly, the historic pools would likely require some grantback provision and other “fair and reasonable” licensing provisions as a precursor to DOJ approval.

The final implied requirement of the DOJ, the need for an independent third party administrator of a pool, was completely absent in the sewing machine and movie patent consortiums. Elias Howe, who along with his key patent was at the center of the Sewing Machine Combination, was likely involved with considerable administration of the pool, at least until his death in 1867. Orlando B. Potter, President of Grover & Baker, is also frequently mentioned as involved with the sewing pool activities.¹²⁹ In the movie patent pool, the administration was far from independent, with one of Edison’s top officials in place making the majority of licensing decisions for the pool, coupled with the implied consent of other patent holders.¹³⁰ Such licensing decisions by the MPPC led to their censure by Judge Dickinson in his 1915 decision as “undue and unreasonable restrictions” which would not be allowed to continue.¹³¹

Unlike historic pools, the MPEG-2 pool vested all their licensing and royalty distribution tasks in a common license administrator, MPEG LA, LLC, with the intent of streamlining the licensing process and removing the specter of overt self-interest from patent holders. Yet even though the Sewing Machine Combination lacked an independent party to analyze patents and licensing arrangements for the pool, this appeared to have little effect on their operations or competition. There is no evidence that there were “complaints” about the licensing or administration, and multiple licensees paid the royalties for a machine license throughout the pool’s twenty-year operation, despite events like the issue of 500 alternate sewing patents from 1856-1877.¹³² Conversely, licensing and control by the MPPC was notoriously anti-competitive, and not simply the lawful assertion “of rights acquired by them through a large number of overlapping patents.”¹³³ So although the DOJ is reassured by the presence of an independent licensing body, this may not be an indispensable element of a

¹²⁸ Id.

¹²⁹ Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

¹³⁰ See The Thomas A. Edison Papers, an editing project of Rutgers University, available at <http://edison.rutgers.edu/>

¹³¹ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

¹³² Cooper, Grace Rogers, (1976), *The Sewing Machine: It’s Invention and Development*, Smithsonian Institution Press. Available at http://www.sil.si.edu/digitalcollections/hst/cooper/CF/page_display_02.cfm?start=7

¹³³ See *United States v. Motion Picture Patents Co. et al.*, (1915), 225 F. 800.

successful and pro-competitive pool. Attorney James J. Kulbaski, testifying before the Federal Trade Commission on hearings regarding competition and intellectual property, stated that while factors such as a third party licensing authority were certainly highly desirable in a patent pool, the absence of such an element “does not necessarily mean that the patent pool is anticompetitive or in violation of anti-trust laws. It merely...will need to be more carefully scrutinized.”¹³⁴

In examining other patent pool elements that may influence competition and innovation, both the MPEG and DVD technology pools, when scored using Professor Gilbert’s “Competitive Hazard” system, demonstrate no competitive harm factors and appropriately score “0” on the scale. Of the historic patent pools examined in this paper, the Sewing Machine Combination showed an approximate score of “2” and the MPPC a score of “6.” The pools may therefore be categorized based on the factors possessed and comparison to other analyzed patent pools as: pro-competitive (MPEG and DVD), pro-competitive to mildly anti-competitive (Sewing Machine), and anti-competitive (MPPC). As anti-competitive factors in a pool increase, restrictions upon innovation may also increase. Yet intense restrictions in a pool, such as those seen in the MPPC, may conversely spur innovation, as evidenced by the actions of the “West Coast Independents.”

Attorney Kulbaski, also in his testimony before the Federal Trade Commission, believed a well-defined standard body, such as those seen in the MPEG and DVD technologies, are fully appropriate subjects for the formation of a patent pool, and have little to no effect on innovation. He pointed out that companies have not stopped developing new technology because of the MPEG and DVD pools, in fact these “companies have and continue to develop new digital video standards such as MPEG-4 and MPEG-7” and “new and better DVD standards.”¹³⁵ Assistant Attorney General Delrahim reiterated this view of standard setting bodies in his recent comments before an April 2018 LeadershipIP Conference, where he advocated for “standard setting bodies [patent pools] to be industry-led” and “encouraged to experiment, to compete with one another, and to be creative” as way to support the interconnectedness of the world.¹³⁶

Another opinion, that of Dr. Frank M. Washko published in the *Georgetown Journal of Legal Ethics*, regards the patent pool as a potentially creative way to extend patent rights “beyond the invented technology.”¹³⁷ Washko suggests that patent pools, as well as blanket licensing agreements, may deter innovation by forming oligopolies and removing the impetus to develop new and better products. Such agreements may “simultaneously increase the barriers to market entry while decreasing competition in [the respective] technology area.”¹³⁸ Dr. Washko’s comments do not relate directly to standard-setting technologies, however, and even Mr. Kulbaski’s strong support of patent pools wavers slightly with regard to undefined technology. “When there are...patents that are not truly blocking and a standard is not involved, a patent pooling arrangement should undergo more careful scrutiny,” testifies Kulbaski, before the Commission. When a technology may be readily implemented with licenses between a few companies, Kulbaski states, there may be “little incentive to innovate and improve upon the

¹³⁴ See “Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property,” by James J. Kulbaski, Esq. (January, 2002).

¹³⁵ See “Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property,” by James J. Kulbaski, Esq. (January, 2002).

¹³⁶ See “Keynote Address at the LeadershipIP Conference on IP, Antitrust, and Innovation Policy,” by Assistant Attorney General Makan Delrahim, (April, 2018), available at <https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-keynote-address-leadership-conference>.

¹³⁷ Washko, Frank M., (2006), “Should Ethics Play a Special Role in Patent Law?”, 19 *Geo. J. Legal Ethics* 1027.

¹³⁸ *Id.*

safety or efficiency of the technology.”¹³⁹

CONCLUSION

There is evidence from both modern and historic patent pools that a well-defined standard appears to be the modern hallmark of a patent pool that promotes competition and innovation. While the historic pools examined lacked a true technological standard, at least one, the Sewing Machine Combination, appears to possess features of approved modern pools, and may be thought of as encouraging both competition and innovative efforts. Anecdotal writings by historians do not support the Combination strongly in either direction as far as its effect on innovation is concerned, yet the record within the patent office conversely does: hundreds of sewing machine and improvement patents were issued in the twenty years of the pool’s operation. Dozens of sewing machine manufacturers and producers churned out new and improved products, and these advances were either complementary or competitive with the products of the Combination. Non-exclusive licensing by the Combination encouraged both the manufacture of the patent pool’s machines and the design of improvements. Distinct, valid, and well-described patents in the pool minimized infringement and provided guidance to “design-around” efforts. The Sewing Machine Combination clearly moved the sewing industry forward and established, as the very first patent pool, a consortium defined by the “proper intent to protect patent rights” as described by Judge Dickinson in 1915.

The Motion Picture Patents Company, although flawed by the overwhelmingly collusive nature of the pool, may also be viewed as encouraging innovation—yet in a more limited manner than witnessed by the sewing machine industry. Additionally innovators in the MPPC case experienced hardships in establishing operations over a thousand miles from the consortium, and conducting their own business with great secrecy and stealth—issues that were not factors in the Combination. Yet despite an occasional trip across the U.S.-Mexico border to evade Edison agents, the “independents” made significant uninterrupted strides to innovate within the movie industry. The evolution of the full-length feature film, actor “star power” and the creation of the Hollywood mystique, all may be attributed to the impetus to innovate spawned by the Edison Trust and their strong-arm tactics.

The legal environment in which the historic pools emerged must also be considered as a factor in relation to competitive and innovation effects. The Sewing Machine Combination formed and began operating over fifty years before the court denied a patent pool in the case of *Standard Sanitary v. U.S.* in 1912. And the Sherman Antitrust act did not even become codified until 1890, more than ten years after the Sewing Machine Combination ended. Courts were therefore not really considering the antitrust implications of patent pools during the years of the Combination; it was not until the *Bement v. Harrow* case of 1902 that the subject was raised, and at least in *Bement*, discarded in favor of patentee rights. Additionally the structure of the sewing machine pool strongly suggests it was pro-competitive, as described by Lewton in his history “The Servant in the House,” where sewing manufacturers made machines “by the payment of only one license fee to the Combination, and anyone who had a good machine that was not an offensive imitation of that of some other licensed manufacturer was granted a license” to use the patents in the pool. Lewton also writes “there was no pooling of any other interest in the Combination excepting that of the patents; each company retained the right to make a certain machine and aimed to so improve and perfect its own particular machine that it would be selected instead of others.”¹⁴⁰ The Sewing Machine Combination thereby preserved

¹³⁹ See “Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property,” by James J. Kulbaski, Esq. (January, 2002).

¹⁴⁰ Lewton, Frederick Lewis, (1930), *The Servant in the House: A Brief History of the Sewing Machine*, Government Publications Office, Washington, DC.

competition, and would have likely been viewed favorably by the courts, both modernly and historically. Conversely the MPPC case was decided during the midst of an “about face” by the Supreme Court with regard to antitrust implications of patent pools following their 1912 decision to disband the *Standard Sanitary* consortium. In *Standard Sanitary*, the Court differentiated that decision from the determination in *Bement*: “The agreements [for enameling processes and production in *Standard Sanitary*] clearly, therefore, transcended what was necessary to protect the use of the patent or the monopoly which the law conferred upon it. They passed to the purpose and accomplished a restraint of trade condemned by the Sherman law. It had, therefore, a purpose and accomplished a result not shown in the *Bement* Case.”¹²⁴ The MPPC, like the *Standard Sanitary* pool, was disfavored by the Court due to its narrowing of competition and restrictive licensing, as well as the explicit attempt to control an entire industry. Similar to the attempted elimination, by the Edison factions, of all the film industry jobbers, as well as the intent to control every level of movie production and distribution, the Court noted in *Standard Sanitary* that “before the agreements the manufacturers of enameled ware were independent and competitive. By the agreements they were combined, subjected themselves to certain rules and regulations, among others, not to sell their product to the jobbers except at a price fixed not by trade and competitive conditions, but by the decision of the committee of six of their number, and zones of sales were created. And the jobbers were brought into the combination and made its subjection complete and its purpose successful. Unless they entered the combination they could obtain no enameled ware from any manufacturer who was in the combination, and the condition of entry was not to resell to plumbers except at the prices determined by the manufacturers. The trade was, therefore, practically controlled from producer to consumer, and the potency of the scheme was established by the co-operation of 85 per cent of the manufacturers...”¹⁴¹

The pattern emerging from an examination of the historical and modern legal and economic patent pool environment strongly correlates with particular elements: licensing parameters, breadth of market, extent of infringement litigation, and level and position of industry control. A number of these factors are unique to the time and place of the particular pool, and therefore are difficult to quantify or qualify for inclusion in a testing instrument. The spur to innovate depends upon many of the same incentives that encourage the formation of a patent pool: infringement risk, cost, potential profit. Subsequently the decision to innovate and engage in research and development in the presence of a patent pool depends directly on the nature of the pool under consideration. A restrictive, license-unfriendly, murky and poorly circumscribed pool will discourage innovation; a good example is the lack of innovative effort close to the MPPC pool. Conversely, a pool free of onerous licensing, composed of complementary and valid patents, and clearly delineated—such as the Sewing Machine Combination—will serve to promote innovation, and, not surprisingly, fall well within legal parameters, minimizing antitrust implications.

Therefore whether the subject of a patent pool is radio, sewing machines, or Hollywood movies, care must be taken to ensure that the consortium continues to promote research, development, and invention—the clear hallmarks of innovation. And while the Department of Justice continues to evaluate patent pools on an ex ante enforcement investigation basis, the decision to innovate, or not, will rest largely with pool founders and their personal conception of the incentive to invent.

¹⁴¹ See *Standard Sanitary Manufacturing v. United States*, (1912), 226 U.S. 20.