SYRACUSE SCIENCE & TECHNOLOGY
LAW REPORTER

VOLUME 23 FALL 2010 ARTICLE , PAGE

The Patent Crisis and How the Courts Can Solve It

By: Dan L. Burk & Mark A. Lemley[1]

Citation: BURK & LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT, (The University of Chicago Press) (2009).[2]

Reviewed by: Victoria E. Munian[3]

Relevant Legal and Academic Areas: Patents, Legal and Policy Reform,

Summary: The patent system is in a crisis. Bad patents being passed and patents being abused in court have currently made patents become ineffective. Congress has tried to find a unitary system for patents, but because different industries need patents for certain needs, this unitary system is ineffective. Burk and Lemley propose that the system needs to address each individual industry in order for the system to be more effective. The authors also propose that courts should take matters into their own hands and judge on a case-by-case basis. By doing so, each industry will fully benefit from patent systems. Issues that arise from this new approach include the courts' role, how courts can begin to change the process through using certain policy levers and the issues of seemingly judicial activism.

About the Authors: Dan L. Burk is Chancellor's Professor at the University of California, Irvine, where is he a founding member of the law faculty. He is internationally recognized for his scholarship on intellectual property, cyber law, and biotechnology law.

Mark A. Lemley is the William H. Neukom Professor at Stanford Law School and director of Stanford's Program in Law, Science, and Technology. He is of counsel to the law firm of Keker & Van Nest and the author of six books and more than ninety articles on intellectual property and antitrust law.

PART ONE: THE PROBLEM Chapter 1: The Gathering Storm

Summary: An explanation of the two different types of patent systems and problems industries encounter with patents.

[1] BURK & LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT, (The University of Chicago Press) (2009).

[2] *Id.* at 3.

[3] J.D. Candidate 2011, Syracuse University College of Law.

Discussion: There are two different patent systems: one where silly patents granted cause people to gain control over a much larger product than needed and one where patents serve a critical role in innovation in industries like pharmaceuticals, medical devices, and chemistry.[4] The pharmaceutical industry complains that patents are not strong enough, don't account for FDA delays, and don't provide enough protection for their investment.[5] While the biotechnology industry sees patents as critical to their survival, the information technology (IT) industry lies at the opposite end of the spectrum.[6]

This book hopes to show readers that the current system clashes with today's industries, and the courts tailoring the unitary patent rule on a case-by-case basis holds the solution. The book also provides policy levers that the courts can use and a detailed example of how to apply these policy levers to two existing industries.

Chapter 2: Functions of Patent Systems

Summary: The authors start with the claim "if you know what the four terms anticipation, involvement, prior art and interference mean, skip this chapter. If you don't know what they mean in the world of patens, read on."[7] For the layman patent reader, this chapter serves as an overview of why we have patents, different types of patent, and components of patents.

Discussion: Patents specifically address useful creations unlike other intellectual property rights.[8] Utility patents, a class created by Congress, cover any new or improved machine, article of manufacture, composition of matter, or process, as long as the subject of the patent meets

[4] BURK & LEMLEY, *supra* note 1, at 3

[5] *Id*. at 4.

[6] *Id*. at 4.

[7] *Id*. at 2.

[8] *Id*. at 8.

certain statutory criteria for novelty, nonobviousness and utility and the inventor has adequately disclosed the invention. [9]

The Patent Trademark Office reviews patent applications.[10] A patent consists of a cover page with a variety of classifying and indexing data as well as at least one or more drawings illustrating the invention.[11] The "background" section describes the prior art (technology up to the development of the invention claimed in the patent) and limitations of prior art.[12] A description of the invention follows, as well as a description of how someone of ordinary skill can make the invention.[13] Because claims show the outer boundaries of the product being patented, the claims portion serves as the focal point of the application.[14] The patentee truly owns what they claim, not what they actually built or described.[15]

Upon receipt, an examiner reviews the application, and, to pass, the invention must fall within the subject matter of patentability, must be useful, and must be novel.[16] Examiners conduct searches of "prior art" (previous patents and publications that may be identical or similar to the invention defined in the claims).[17] Eventually the examiner will issue a final decision, but

[9] BURK & LEMLEY, supra note 1, at 8-9.

[10] *Id*. at 9.

[11] *Id.* at 9.

[12] *Id.* at 10.

[13] *Id*. at 10-11.

[14] BURK & LEMLEY, *supra* note 1, at 11.

[15] *Id*. at 12.

[16] *Id*. at 13.

[17] *Id*. at 14.

because patentees can file "continuation" applications as many times as they wish, the final decision is not permanent.

Chapter 3: Cracks in the Foundation

Summary: This chapter sets up why the patent system seems to be in a crisis at the moment, including patent flooding in the system.

Discussion: The 200 year old patent system still invokes great debate.[18] Some proponents claim there is serious need of patent reform while others say there is no problem.[19] So how is the patent system in a crisis? One of the problems includes patent flooding where the PTO issues over 450,000 patents a year.[20] With rampant patent passing and by passing patents people have not really invented, the PTO risks being discredited. [21]

Today patent applications overburden the PTO, so getting a patent passed is easy.[22] Examiners go through a long and extensive process to approve patents, especially since they have so many patent applications to review. Thus, examiners may pay less attention to applications they review.[23] It typically takes 2-3 years for a patent application to be either approved or denied; however, examiners typically spend 18 hours in reviewing an individual application.[24] The short amount of review time coupled with inventors having the right to file

[18] BURK & LEMLEY, *supra* note 1, at 21.

[19] *Id*. at 21.

[20] *Id*. at 22.

[21] *Id*.

[22] *Id*.

[23] BURK & LEMLEY, *supra* note 1, at 22-24.

[24] *Id*. at 23.

unlimited continuation applications can lead to bad patents being passed.[25] The uncertainty that follows when other companies do not know whether their invention will lead to patent litigation also presents a problem.[26]

The forms of relief available to patentees run the risk of providing patent owners with more discretion over their inventions than they are entitled; thus, they enter into litigation to gain any kind of reward.[27] Problems with inventors abusing litigation include injunctive relief being granted and pulling popular products out of the market because the product contains one small patented component. Another problem includes royalty stacking where a single product potentially infringes on many patents and, as a result, is obligated to pay the royalties on them.[28]

With all of the problems in the patent system, companies may not be deterred from inventing new products, even if the new product already includes other patents.[29] Researching about patents beforehand serves as a disadvantage for inventors because it may make the inventor a willful infringer.[30] All of these problems make stronger patent protection necessary.[31]

PART TWO: THE DIAGNOSIS **Chapter 4: The Diversity of Information**

Summary: Each industry wishing to acquire patents innovates differently. There are a number of incentives as well as risks that go hand-in-hand with innovation.

---

[25] BURK & LEMLEY, *supra* note 1, at 24-25.

[26] *Id*. at 27-28.

[27] *Id*. at 26-27.

[28] *Id.* at 29.

[29] *Id.* at 31.

[30] BURK & LEMLEY, *supra* note 1, at 32.

[31] *Id*. at 33.

Discussion: A consensus agrees that there needs to be a system of patent protection; however, the different needs of each industry must be addressed. [32] The pharmaceutical and semiconductor industries cost the most to invent while the software and biotechnology industries cost the least.[33] The higher cost of investment leads to a greater need for patents.[34] The pharmaceutical and semiconductor industries spend the most money on research and development while the software and biotechnology industries spend smaller amounts on research and development.[35]

In addition to the cost of research and development, the ability of the inventor to appropriate returns on her invention plays an important role in the need for stronger patent protection.[36] Appropriability of return is a combination of a complex set of variables which are industry specific.[37] One variable is cost and speed of imitation. For example, inventions that show on their face how they are made are more susceptible to being imitated, while inventions that have more components may not be so easy to imitate.[38] Even if imitation is possible, inventors who are first to invent have a 'first-mover advantage' where innovators who are first to market often enjoy substantial advantages over later imitators, even if access is not restricted.[39]

---

[32] BURK & LEMLEY, *supra* note 1, at 38.

[33] *Id*. at 39-41.

[34] *Id.* at 39.

[35] *Id.*

[36] *Id.* at 42.

[37] BURK & LEMLEY, *supra* note 1, at 42.

[38] *Id.* at 42.

[39] *Id.* at 43.

The combination of incentives and patent protection leads to continuing innovation and also gives rise to "spillovers", where innovation in one firm will be leaked out and naturally subsidize the productivity of other firms.[40] Some argue that this discourages innovation, but spillovers drive innovation because inventors gain sufficient returns to justify the investment in their innovation.

With the benefits of innovations also comes risk. High costs that may slow productivity. Also, more innovation may not be a good thing because it may divert investments in research and development another industry may need.

Chapter 5: The Industry-Specific nature of the patent System

Summary: An overview of how the prosecution of patents in each industry varies. A discussion on which industries are most likely to seek patents, the patent prosecution process, the scope of patents in each industry, the importance of patent portfolios to industries, and the use and enforcement of patents by industry.

Discussion: Deciding to seek patent protection varies by industry.[41] The pharmaceutical company seeks the most patents while the biotechnology industry spends the most money obtaining patents.[42] The high costs in research and development and invention cause these industries to seek patent protection while the importance of building patent portfolios in the IT industry drives the need for patent protection.[43]

[40] BURK & LEMLEY, *supra* note 1, at 46-47.

[41] *Id.* at 49.

[42] *Id.* at 49-50.

[43] *Id.* at 50.

When a firm decides to obtain a patent, the process it takes depends on the invention's industry, as some examiners may require more claims for one industry over another. [44] Also, the difference in that need may make it more difficult to obtain a patent in some industries than others.[45] Some companies may go the extra distance to secure their patents by drafting more claims and prior art claims, fighting broader claims, or requesting more continuation applications in order to "bulletproof" important patent applications.[46]

Another important issue that varies by industry is the scope of patents.[47] Originally there was a one-to-one correspondence of product to patent where one patent covered a single product; however, this concept has become a rarity since products have become so complex.[48] The chemistry and pharmaceutical industries are more likely to have one-to-one patents for a new chemical or new product while industries, like semiconductors, have complex products which require many patents to cover all components of the final product. The dissimilarities between industries do not provide a way to apply remedy rules or damages evenly across the board to all.[49]

Patent portfolios, large blocks of patents surrounding a particular technology, make correspondence between products and patents more complicated.[50] These portfolios have a greater value than the sum of individual patents because they narrow the scope and protect

[44] BURK & LEMLEY, *supra* note 1, at 50-51.

[45] *Id.* at 51-52.

[46] *Id.* at 53.

[47] *Id.* at 53.

[48] BURK & LEMLEY, *supra* note 1, at 53.

[49] *Id.* at 54.

[50] *Id.*

against risks of invalidity claims since it is hard to show invalidity for hundreds of patents in oppose to one.[51] Portfolios mostly exist in companies and select industries like semiconductor and computer industries as it is rare to have a patent portfolio for a one-to-one correspondent product.[52]

When cases do make it to judgment, the law treats patents in different industries differently.[53] The reasoning is that the application process for the industry is different, so applying one to all would change the law.[54]

Chapter 6: Heterogeneity in Patent Theory: Why We Can't Agree Why We Patent

Summary: An explanation of the different types of patent theories that exist, their problems, and how scholars in these fields potentially solve them.

Discussion: We grant patent laws to encourage innovation, and they help to provide a greater good for everyone.[55] Different theories of patent law make predictions about the effect of patents on innovation and dictate different and conflicting prescription about the parameters of patent law.[56] The theories include the classic theory (where goods are made for the good of everyone and the inventor is entitled to protection), prospect theory, competitive innovation theory, cumulative theory, and the anticommons theory.[57]

---

[51] BURK & LEMLEY, *supra* note 1, at 54.

[52] *Id.* at 55.

[53] *Id* at 58.

[54] *Id* at 65.

[55] *Id.* at 67.

[56] BURK & LEMLEY, *supra* note 1, at 68.

[57] *Id.* at 68-78.

Prospect theory is rooted in classic theory but focuses on the "tragedy of the commons" and the hypothetical Coasean world without transactions costs.[58] The tragedy of the commons defines the economic story where people who access common property overuse it because each individual reaps the benefits for his personal use but shares only a small portion of the costs.[59] Assigning a small portion to everyone so that anyone who takes advantage will feel the full consequences solves the tragedy of the commons problem.[60] Edmund Kitch applies this theory to IP and argues that the patent system operates not as an incentive-by-reward system but as a prospect system analogous to mineral claims.[61] The patent system wants to encourage further commercialization and efficient use of unrealized ideas by patenting them.[62]

Kenneth Arrow argues that the competitive innovation theory encourages innovation the best because the companies in competitive marketplaces innovate in order to avoid losing to a competitor while lazy monopolists fear that new inventions will steal their markets.[63] With this theory, no tragedy of the commons problem exists because one person's use of the information does not deprive others of the ability to use it.[64]

Cumulative innovation is when a final product results not only from an initial invention but from one or more improvements to that invention.[65] Where innovation is cumulative, patent

---

[58] BURK & LEMLEY, *supra* note 1, at 69.

[59] *Id.* at 69.

[60] *Id.* at 69.

[61] *Id.*

[62] *Id.* at 69-70.

[63] BURK & LEMLEY, *supra* note 1, at 72.

[64] *Id.*

[65] *Id.* at73.

law has to decide how to allocate the rights between initial inventors and improvers, and one way to do so involves giving all of the rights of the initial inventor as prospect theory would do or to try to allocate rights through "tailored incentives."[66] Granting rights to both initial inventors and improvers will balance the incentive to invent and improvers can still be protected from liability.[67]

Michael Heller describes the anticommons theory as scenarios where every piece of invention is privately owned and a problem arises with transactions costs and behavior that may prevent the aggregation of needed rights.[68] The anticommons theory is characterized by fragmented property rights that are needed to make effective use of the final product.[69] But aggregating requires negotiating and some companies may "holdout" and refuse to license, thereby driving up the costs.[70] This usually happens with real property in the market.[71] There are horizontal and vertical anticommon problems: horizontal problems occur when two different companies hold rights at the same level of distribution while vertical problems occur if a product must be passed through a chain of independent companies or if patents on research must be integrated to make a finished product.[72] Two ways to solve the anticommons problem are to either consolidate ownership of rights among few companies or grant fewer patents.[73]

---

[66] BURK & LEMLEY, *supra* note 1.

[67] *Id.* at 75.

[68] *Id.* at 76.

[69] *Id*. at 76.

[70] *Id.*

[71] BURK & LEMLEY, *supra* note 1.

[72] *Id*. at 77.

[73] *Id.* at 77.

Related to the problem of complements and anticommons is patent thickets, where horizontal overlap exists between patents because the patent claims are broader than the products invented.[74] These patent thickets make it difficult for new items to come into the market because new inventions need patent permission for each patented product.[75]

Chapter 7: Parts of the Elephant: How Industry Perspective Drives Patent Theory

Summary: A discussion of the different patent theories which ones suit which industry.

Discussion: The key to understanding patents opens our eyes to see that different industries have different contexts in which patents exist.[76] First, the prospect theory, where the pharmaceutical industry fits, is based on the theory that strong rights should be given to the first inventor and that there is a single inventor because of the initial costs.[77] The research and development process is expensive, and there is potential for further innovations.[78] Also, if patent protection did not exist, innovation would drop because there would not be protection from potential imitators; thus, the prospect theory matches with the pharmaceutical industry.[79]

Competitive innovation focuses on the incentives companies have to innovate even if they do not hold a monopoly position.[80] Industries that have substantial innovation and small

[74] BURK & LEMLEY, *supra* note 1, at 77-78.

[75] *Id.* at 78.

[76] *Id.* at 79.

[77] *Id.* at 80.

[78] *Id.*

[79] BURK & LEMLEY, *supra* note 1, at 81.

[80] *Id.* at 81-82.

research and development costs in the absence of patent protection are well suited with this theory.[81]

Cumulative innovation is an ongoing process which requires contributions of many different inventors, each building on the works of others; however, the law has to divide property entitlements in order to provide incentives to improvers.[82] Cumulative innovation is very compatible with the modern software industry because there is an incremental improvement process of products, it responds to the hardware-based constraints of the software industry, and improvement helps preserve interoperability.[83]

The anticommons theory, compatible with DNA sequence patents in the biotechnology industry, emphasizes problems of divided entitlement among complements.[84] There is a long development and testing time and there are also other types of generic producers trying to infringe on the initial inventor.[85] There is a lot of horizontal and vertical overlap in this industry and, thus, a risk of bargaining breakdown previously discussed in chapter six.[86]

Patent thickets, related to the anticommon aggregate theory, are a problem most apparent in the semiconductor industry.[87] The theory here emphasizes the issuance and scope of overlapping because of the substantial time and resources put into inventing the product.[88]

---

[81] BURK & LEMLEY, *supra* note 1, 82-83.

[82] *Id*. at 83.

[83] *Id.* at 83-84.

[84] *Id.* at 86.

[85] *Id.* at 86.

[86] BURK & LEMLEY, *supra* note 1, at 87-89.

[87] *Id.* at 89-90.

[88] *Id.* at 90-91.

Chapter 8: Why Courts and Not Congress Offer a Way Out of the Crisis

Summary: A discussion of how Congress is unable to pass laws that are appropriate for all industries to use. In addition, a proposal of how the courts can use the existing law and policy levers to help each industry.

Discussion: The previous chapters show that a unitary system cannot provide the same benefits in every industry.[89] Instead, the unitary patent statutes that already exists gives courts enough discretion to build policies into discussions to help each industry.[90] These "policy levers" help patent law, taking into account the technology-specific nature of the patent system without inviting the trouble that specialized statutes would bring.[91]

Congress has been making more industry specific patent laws ranging from pharmaceuticals, medical procedures, and genetically modified humans to the obviousness standard for biotechnology processes and new defenses against business method patents; however, these new statutes do not help all industries.[92] Making patent laws specific for each industry violates the Trade-Related Aspects of Intellectual Property Rights, makes it hard to translate the law into other industries, has high costs, and causes overlap in industries with products; therefore, line drawing in legislation would be very difficult.[93]

Patent reform in Congress has been attempted, but what has been learned is that each industry is different and policy provisions in place are making patent protection worse; however,

[89] BURK & LEMLEY, *supra* note 1, at 95.

[90] *Id.*

[91] *Id*.

[92] *Id.* at 95-96.

[93] *Id.* at 97-99.

when policy levers are used, protection is better.[94] What needs to occur is a flexible common law principle where judicial oversight is best for each technological field. The Federal Rules of Civil Procedure allows judges to appoint experts to advise them, which may help in complicated litigation.[95] Also, money spent on litigation would subsidize the costs of rewriting statutes.[96]

Skeptics say that litigation costs money, judicial expertise is limited and appellate courts are not immune to public choice, but proponents respond that with the statutes already in place, revisions would be very hard.[97] Also, even though legislatures have better recourses to investigate and develop factual evidence, the courts can hear numerous cases and adapt to the IP policy within a reasonable life frame and cost.[98] Courts are the way to fill in gaps between the statutes and industries. Also, using courts would avoid the lobbying concern.[99]

Administrative agencies are another way for upkeep because, like the legislature, they have greater expertise and investigatory resources, but, most importantly, they are not susceptible to interest seeking people since they are not controlled by the public.[100]

Some argue that allowing the courts to do this type of policy analysis is judicial activism, but because the court continues to fill the gaps the legislature has left in the law, it is not.[101] If judicial activism means that the speaker disagrees with the court's decision, then it refers to the

---

[94] BURK & LEMLEY, *supra* note 1, at 101-02.

[95] *Id.* at 104-05.

[96] *Id.*

[97] *Id.* at 105.

[98] *Id.*

[99] BURK & LEMLEY, *supra* note 1, at 105-06.

[100] *Id.* at 106-07.

[101] *Id.* at 107-08.

court usurping the role of Congress.[102] What happens here is different: when courts do not have proper guidance, they take into account the realities of the modern patent system. .[103]

Chapter 9: Policy Levers in Existing Patent Cases.

Summary: An explanation of policy levers in the categories of ones that affect whether someone can obtain a patent at all, and, if so, whether it is valid; ones that affect the scope of the resulting patent; and, those that affect the remedies for patent infringement.

Discussion: In order for courts to apply the law to each industry, they should use the policy levers that already exist.[104] There are levers that operate on the macro and micro level: macro level levers expressly treat different industries differently while micro level levers treat different inventions differently, without regard to industry, but in ways that have disproportionate impacts on other industries.[105] The three categories of policy levers discussed here affect whether someone can obtain a patent at all, and if so whether it is valid; ones that affect the scope of the resulting patent; and those that affect the remedies for patent infringement.[106]

In patent acquisition and validity, utility, experimental use, the level of skill art, written descriptions, and secondary considerations of nonobviousness determine whether the patent can qualify as valid.[107] Traditionally, the court had three separate tests for utility but now uses only one test to find whether the invention is morally beneficial to society.[108] Chemistry and

---

[102] BURK & LEMLEY, *supra* note 1, at 107.

[103] *Id*. at 108.

[104] *Id.* at 109.

[105] *Id*. at 109-10.

[106] *Id.* at 110.

[107] BURK & LEMLEY, *supra* note 1, at 115-22.

[108] *Id.* at 110-11.

biotechnology are the only fields with exceptions to the effective elimination of the utility requirement because a chemical must show some concrete and finished application before it can be patented or else it is not complete. This shows that the utility doctrine is a macro policy lever.[109]

In relation to the obviousness standard under the level of skill at, there is the "perspective of the person having ordinary skill in the art" (PHOSITA), a macro policy which states that any person skilled in the art should be able to make and use the claimed invention.[110] PHOSITA shows up in judicially created patents because judges ask how PHOSITA would understand the terms in patents claims or understand the standards for infringement by equivalent.[111] PHOSITA varies by industry with the software industry having a broad interpretation and the biotechnology having a narrow one.[112]

Patent scope has been limited in that abstract ideas cannot be patented, but reasonable interchangeability is not necessarily equivalent.[113] The latter is an alternative to the doctrine of equivalents that asks whether one of ordinary skill in the art would consider the accused element to be reasonably interchangeable with the limitation described in the patent.[114] There is also the micro level of element-by-element analysis in regards to testing the doctrine of equivalents because only if each element is presented in the new device will there be an infringement.[115]

---

[109] BURK & LEMLEY, *supra* note 1, at 111-12.

[110] *Id.* at 115-16.

[111] *Id.*

[112] *Id.*

[113] *Id.* at 122-23.

[114] BURK & LEMLEY, *supra* note 1, at 124.

[115] *Id.* at 125-26.

Patent scope also takes into account the micro policy lever of pioneering patents which gives broad protection to pioneers in case others try to commercialize applications of the patens to find a new scope.[116] Lastly, the micropolicy of reverse doctrine of equivalents, used more radically in other industries like biotechnology, permits an accused to escape literal infringement by showing the device is so far changed in principle from the patented invention that it would be inequitable to hold the infringer liable.[117]

Remedies available include a reasonable royalty where patentees are entitled to damages "adequate to compensate."[118] It is the fallback remedy when the court denies injunctive relief or the injunction occurred after infringement.[119] Courts use the multifactor test to determine royalty rates.[120]

Chapter 10: More We Can Do: Potential New Policy levers

Summary: This chapter includes new policy levers the courts can use with the current statutes in place, including new secondary consideration of non obviousness, a stronger presumption of validity and patent remedies.

Discussion: With the current laws that are in place, the courts can use different components of the laws to enact policy levers. Under patent acquisition and validity, the court can use new secondary considerations of nonobviousness where the courts look at the cost and uncertainty of innovation to approve a patent's validity.[121] Also, the courts can use a lower presumption of

[116] BURK & LEMLEY, *supra* note 1, at 127.

[117] *Id.* at 128.

[118] *Id.* at 128-29.

[119] *Id.*

[120] *Id.* at 129.

[121] BURK & LEMLEY, *supra* note 1, at 131-32.

validity as a macro policy by granting a stronger presumption in some industries than others.[122] The problem with this approach is that there is not enough evidence about the validity and that type of evidence is difficult to find.[123]

Finally the remedy of injunction can be used as either a macro or micro policy lever.[124] Because patents are a property rule, the court could grant an injunction in some industries or could deny on a case by case basis in others.[125]

Chapter 11: Levers in Specific Industry—Biotechnology

Summary: This chapter shows how tailoring the policy levers best suits the biotechnology industry. A sketch of the biotechnology industry, early tailoring, recent tailoring, and a new direction for biotechnology are covered.

Discussion: The biotechnology industry has been directed at human pharmaceuticals and biologics and has been placed in the high-cost, high right innovation, with high delays category.[126] In the early development of the industry, the PHOSITA, for example, was used in different ways.[127] The court encouraged the development of the industry in the beginning by making policy judgments and tweaking the legal doctrines to achieve what the desirable effects.[128]

---

[122] BURK & LEMLEY, *supra* note 1, at 133-34

[123] *Id.* at134.

[124] *Id.* at 137-38.

[125] *Id.* at 137-138.

[126] *Id.* at 143.

[127] BURK & LEMLEY, *supra* note 1, at 146.

[128] *Id.* at 147-48.

Recently the industry has changed and the courts now look at the policy questions surrounding biotechnological patents.[129] There is a need for more protection without deterring innovation.[130] The courts should, then, modify Merger's classic theory where the obviousness threshold is lowered to encourage investment.[131] The case of *KSR* shows that the court may already be moving in this direction.[132] This approach will produce fewer patents and solve the anticommons problem with DNA.[133]

New policy levers may become appropriate as the field grows.[134] An example of how new policy levers may arise may be from the so-called –omics revolution: these new molecules are modifications or improvements on existing patented molecules.[135] Thus, the doctrine of equivalents would be applied for these new developments and how it is to be applied will need to be monitored to ensure that these friends don't gain too much broad control over a patent.[136]

Chapter 12: Levers at Work—the IT industry

Summary: The discussion in this chapter of the IT industry serves as a comparison for the biotechnology industries.

[129] BURK & LEMLEY, *supra* note 1, at 148-50.

[130] *Id.*

[131] *Id.*

[132] *Id.* at 151.

[133] *Id.* at 151-52.

[134] BURK & LEMLEY, *supra* note 1, at 153.

[135] *Id.*

[136] *Id.* at 154-55.

Discussion: The software industry has a very quick and cheap development process.[137] There are many new developments on the systems and the software industry is hurt the most by the patent system.[138] Some critics say that the patent system should be abolished for software because of the speed and turnover for software.[139] Few software patents actually meet the level of validity. The obviousness doctrine needs to be reformed for software patents either by way of a more informed application or the level of skill in the art or new secondary considerations of nonobviousness.[140]

The patent scope on software needs to be limited by stronger disclosure requirements.[141] Also, because software is characterized by cumulative innovation, the industry runs into the problem of holdups and not being able to collect reasonable royalties; however, software may be appropriate for the new policy lever of reverse engineering.[142] This new policy lever will raise infringement problems unique to software.[143]

The semiconductor also requires new incentive tailoring because of patent thickets that exist.[144] Broadening the scope of patents may help the need for increasing patentability in the semiconductor industry; however, a developer does not own broad rights over a device.[145]

---

[137] BURK & LEMLEY, *supra* note 1, at 156.

[138] *Id.* at 157.

[139] *Id.* at 157-158.

[140] *Id.* at 159.

[141] *Id.* at 159-60.

[142] BURK & LEMLEY, *supra* note 1, at 160-61.

[143] *Id.* at 162.

[144] *Id.*

[145] *Id.* at 163.

While the industries discussed here are not static, this has opened the discussion for the tools courts can use to help aid different industries in gaining more patent protection.[146]

Conclusion: New Directions

Innovation and patent law work differently in different industries, and in order for the law to take into account these differences the courts need to use policy levers on Congress' general rules, or the PTO needs to tailor the patent law to different industries; however, the problems of the PTO not being able to handle this task and the PTO not having any policy may be problems for this approach. [147] Secondly, the PTO not only needs to take into account more than validity issues but also potential infringements down the road.[148] Finally, the courts hold the key in solving patent problems.

[146] BURK & LEMLEY, *supra* note 1, at 164-65.

[147] *Id.* at 167-68.

[148] *Id.* at 168.