

# Theoretical Justification for Exceptions and Limitations to Patent Rights

Dr. Saleena KB\*

Assistant Professor, Jazan University, KSA

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\*Corresponding author: Dr. Saleena KB

## Abstract

The paper explores theoretical justifications for granting patent monopolies in order to clarify the implications of existing patent doctrine and to have a theory for limitations to those patent rights.

**Keywords:** Patent, Limitations and exceptions, Theories of innovation.

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## INTRODCUTION

As stated by Antoine-Augustin Renouard, the French philosopher, patent rights are based on two propositions that must be reconciled: Therefore, here are two propositions, both of which are incontestable: one, is that the legitimate rights of the inventor oppose the exploration of the discovery made by his genius with complete freedom of competition by whoever can understand it; the other, is that each member of the human species has the right to freely use his thought, regardless of where it comes from, and to impress on any part of matter that he masters the form of the invention which he has understood with his intellect and identified with his thought<sup>[1]</sup>.

For Renouard, these propositions were reconciled by a system of payment, whereby a temporary, exclusive privilege is granted to the inventor. The consequence of a temporary monopoly, according to Renouard, is freedom from competition, which will "have the effect of rising the average price at which the products will be delivered to consumers" whereby "one is reduced to so feeble an objection as the delay that the temporary monopoly could bring to reducing the price of the products of the invention." The temporary exclusive right of an inventor, therefore, should protect his freedom to profit or otherwise exclude others from benefiting by his invention. However, the benefit of his invention should not include the right to exclude discovery of the manner in

which it operates or to improve upon it. Such a right would limit the public's source of thought and the consequent ability of the public to master "the form of the invention which he has understood with his intellect and identified with his thought [<sup>2</sup>]."

Thus patent is a time-limited, exclusive right granted for an invention. This invention may be a new product or process and the patent protects the owner or inventor from others who may attempt to make, use, distribute or sell the invention without the patent owners consent [<sup>3</sup>]. Patents have the primary function of serving as metering devices for society to measure an invention's value, thus allowing patentees to stipulate competitive prices for inventions and, consequently, on the products and services that embody them. Patents therefore are neutral social mechanisms that contribute to an adequate allocation of private resources to the creation of technology [<sup>4</sup>].

As Abraham Lincoln once put it "The Patent System added the fuel of interest to the fire of genius [<sup>5</sup>]." A Patent statute confers the exclusive right to

<sup>2</sup> Id at p.675.

<sup>3</sup> Robert P. Merges, As Many As Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform, 14 Berkeley Tech. L.J. 577, 587 (1999)

<sup>4</sup> "TRIPs Regime of Patent Rights", Nuno Pires De Carvalho, Kluwer Law International, London, 2002, p.1.

<sup>5</sup> <http://www.ladas.com/Patents/USPatentHistory.html>

<sup>1</sup> "The Nature of a Patent Right", Thomas Reed Powell, *Columbia Law Review*, Vol. 17, No. 8. (Dec., 1917), pp. 663-686.

make, use, and sell the invention set forth in the patent claims for a limited period. During the term of the patent the patent holder has the right to stop anyone from using the invention- even an innocent infringer who develops the same invention independently. Patent holders need not exploit their exclusive rights themselves, but may sell or license them to others in exchange for royalties, or even use their patents to suppress the underlying inventions entirely. In exchange for these exclusive rights, the patent statute requires the inventor to disclose the invention in the patent application in terms sufficient to enable others who are "skilled in the art" to make and use it [6]. This enabling disclosure becomes freely available to the public as soon as the patent issues; the patent holder may not thereafter monitor or control access to it. This enabling disclosure in the patent is characterized as the "quid pro quo" of the patent monopoly. In order to obtain a patent, the applicant must first contribute "a measure of worthwhile knowledge to the public storehouse. Although the patent statute on its face grants the patent holder the unqualified right to exclude others from using the invention until after the patent expires, the timing of the disclosure requirement suggests that there are limits to the patent holder's exclusive rights even during the patent term[7]. If the public had absolutely no right to use the disclosure without the patent holder's consent until after the patent expired, it would make little sense to require that the disclosure be made freely available to the public at the outset of the patent term.

Thus the patent statutes facilitate certain unauthorized uses of the invention while the patent is in effect for furthering the larger public interest which may vary with the changing time and technology [8]. Exclusive rights that are granted to inventors in exchange for disclosure to the public of useful inventions are calculated to provide an incentive to the population as a whole and to reward inventors for their discoveries. The period and scope of exclusivity are limited in order to permit society to fully exploit an inventor's contribution once the inventor has been given a reasonable opportunity to profit from the invention without competition[9]. We can see that through out the patent history of the last 500 years, there has been a continuous tension and an ever-shifting balance between the public interest in having access to the

benefits of inventions and the private interests of patent owners in fully exploiting the exclusive rights afforded them within the patent system[10].

To reconcile these competing interests, the patent regimes have in course of time developed a series of mechanisms like defining the subject matter and standards of patentability, restricting the duration of monopoly and also by limiting the monopoly privilege after the grant by strategies like research exemption, parallel importing and compulsory licenses[11].

On analyzing the history of patent grant, it is clear that patent grants are made with the vested interest of the sovereign of each particular period and place to serve the political and economic hegemony of his kingdom[12]. There was no single grant which showed the anxiety to reward the inventive genius of the patentee [13]. The theoretical justification of patent grants also substantiates that patent grants were always for the purpose of promoting and fostering innovation and inventiveness; though they supported individual monopoly.

### Theoretical justification of the Patent system

In analyzing how patents promote public purpose, especially scientific progress, traditionally two mechanisms are emphasized: first, the prospect of obtaining a patent monopoly provides an incentive to invest in research to make new inventions; and second, the patent system promotes disclosure of new inventions and thereby enlarges the public storehouse of knowledge. In addition to these traditional theories of patent grant recently, post patent grant monopolies are justified by the prospect theory of Edmund Kitch and monopoly theory of Joseph Schumpeter[14].

### Incentive to Invent

The incentive to invent theory holds that too few inventions will be made in the absence of patent protection because inventions once made are easily appropriated by competitors of the original inventor who have not shared in the costs of invention [15]. If successful inventions are quickly imitated by free

<sup>6</sup> Simon A. Rose, "Patent Monopolyphobia: A Means Of Extinguishing The Fountain Head", IPLR, 2000, 32, 3-51.

<sup>7</sup> Janusz A. Ordover, "A Patent System For Both Diffusion And Exclusion", 5 J.Econ.Persp.( 1991) at43.

<sup>8</sup> Gerald T. Welch, "Patent Laws Ephemeral Experimental Use Doctrine: Judicial Lip Service To Judicial Misnomer Or The Experimental Stage Doctrine", 13 IPLR 1981, 235-262.

<sup>9</sup> Yoram Barzel, "Optimal Timing of Innovation", 50 Rev.Econ.Stat.348 (1968).

<sup>10</sup> Kenneth W. Dam, " The Economic Underpinnings Of Patent Law" 27 IPLR 1995, 3-28

<sup>11</sup> William F Baxter, "Legal Restrictions On The Exploitation of Patent Monopoly: An Economic Analysis", L.Q.R 1911, Vol.27, p.60-74.

<sup>12</sup> Walton Hamilton, "Patents and Free enterprise", 16 J.PAT.OFF.SOCY, 35.

<sup>13</sup> Walton Hamilton, "Colonial Monopolies and Patents" 18 J.PAT.OFF.SOCY, 85.

<sup>14</sup> William W. Fisher 111, Property and Contract on the Internet, 73 Chi.-Kent L. Rev. 1203, 1212-15 (1998)

<sup>15</sup> Carlos A. Primo Braga & Carsten Fink, The Economic Justification for the Grant of Intellectual Property Rights: Patterns of Convergence and Conflict, 72 Chi.-Kent L. Rev. 439, 440 (1996)

riders, competition will drive prices down to a point where the inventor receives no return on the original investment in research and development. As a result, the original inventor may be unable to appropriate enough of the social value of the invention to justify the initial research and development expenditure [16]. The high risk involved in research compounds the likelihood of underinvestment in invention. Thus inventions with potentially great social benefits might never come about, or at least might be significantly delayed, unless private returns to invention were increased above their free market levels[17]. Patents serve to bring the private benefits of inventions in line with their social value by allowing inventors to use their monopoly positions to extract a price that more closely approaches the value that users receive from invention[18].

### Incentive to Disclose

The incentive to disclose argument rests on the premise that in the absence of patent protection inventors would keep their inventions secret in order to prevent competitors from exploiting them. Secrecy prevents the public from gaining the full benefit of new knowledge and leads to wasteful duplicative research [19]. As per this theory patents are not necessary to induce innovation. However patents encourage and provide a vehicle for disclosure and more generally generate quick and wide diffusion of the technical information underlying new inventions [20].

This theory focuses on commercially oriented inventions, and assumes that they can appropriate some returns from a new process or product simply by using or producing it, while keeping the relevant information secret to prevent rapid imitation. The possibility of patenting the invention however lures the inventor into making the information public [21]. In earlier years the argument was couched in terms of society's access to

the technology after the inventor had died. However in the modern world were companies rather than individuals are largely the custodians of invention-specific technological knowledge, the issue must be clearly posed more generally in terms of the speed, breadth, and completeness of the information disclosure or leakage. It is assumed that the inventor by him or herself cannot exploit all possible uses of the invention. Then to the extent that publication of a patent attracts the attention of parties who can make use of the invention, the patenting can increase use. Thus this theory emphasizes the 'advertising value' of patents [22].

### Incentive to Innovate and the Prospect Theory

This theory holds that a patent monopoly is necessary to induce firms to invest in "innovation"- i.e., putting existing inventions to practical use. Even after an invention has been made, considerable further investment is often necessary before it is ready for commercial exploitation. Further research and development may be needed to establish the commercial feasibility of the invention and to bring it into large scale production. Use of the invention may call for the construction of new plant and equipment. A new product invention may require further refinements to suit the tastes of consumers, as well as promotion and advertising expenditures to persuade consumers to buy it[23]. These additional investments may dwarf the initial research expenditures in making the invention. The protection of a patent monopoly enhances the likelihood that a firm will be willing to undertake these investments [24]. Like the incentive to invent and incentive to disclose theories, the incentive to innovate theory holds that the patent system achieves its objectives by offering monopoly profits as a lure to promote desired behavior. But it differs from these other theories with respect to the time frame in which the incentive matters. The incentive to invent and incentive to disclose theories are concerned with incentives that operate before patent issues [25]. These theories assume that the patent monopoly has already served its social function of promoting invention and disclosure as soon as the patent issues, and that enforcement of the patent thereafter is simply the regrettable price that society must pay in order to live up to its end of the bargain. Reducing the strength of existing patents would thus presumably offer short run

<sup>16</sup> Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 Tex. L. Rev. 989, 994-96 (1997)

<sup>17</sup> Steven J. Grossman, *Experimental Use or Fair Use as A Defense to Patent Infringement*, 30 IDEA 243, 255 (1990)

<sup>18</sup> Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. Legal Stud. 247, 253-54 (1994)

<sup>19</sup> Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 Colum. L. Rev. 1600, 1614 (1982)

<sup>20</sup> Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 Colum. L. Rev. 839, 854 (1990)

<sup>21</sup> Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 Tenn. L. Rev. 75, 89 (1994)

<sup>22</sup> Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 Yale L.J. 177, 220-26 (1987)

<sup>23</sup> Clarisa Long, "Patent Signals", 69 U. CHI. L. REV. 625, 628-35 (2002).

<sup>24</sup> Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. Chi. L. Rev. 1017, 1023 (1989)

<sup>25</sup> Charles Ever Bridge, "Is the Patent Misuse Doctrine Obsolete?" 110 Ham. L. Rev. 1922, 1927-28 (1997)

social benefits by increasing the use of already patented inventions, although in the long run it would reduce incentives to make and disclose new inventions<sup>[26]</sup>. By contrast, the incentive to innovate theory gives existing patents an ongoing role in preserving the incentives of patent holders to invest in development during the patent term. Reducing the strength of existing patent monopolies might thus have the effect of undermining incentives to put existing technologies into use<sup>[27]</sup>.

We can see that this post innovation theory is further supported by the monopoly theory of Joseph Schumpeter and the prospect theory of Edmund Kitch.

### The Schumpeterian Theory

The thesis that monopolies are conducive to innovation is generally associated with the work of Joseph Schumpeter on economic development<sup>[28]</sup>. While Schumpeter does not focus exclusively on either technological innovations or the patent system, his analysis suggests how patent monopolies might promote technological innovation. He distinguishes innovation from invention, noting that invention itself produces "no economically relevant effect at all. Innovation, on the other hand, brings about incessant revolutionary changes in the economic system through what Schumpeter calls "a process of creative destruction. In this process, new firms continually arise to carry out new innovations, driving out old firms that provide obsolete goods and services. Competition from new commodities and new technologies is far more significant in this model than price competition among firms offering similar goods and services<sup>[29]</sup>. Schumpeter argues that in a dynamic model of the capitalist system, monopoly conditions may promote innovation and growth more effectively than competition. He bases this view primarily on "the tritest common sense," although he also notes as a matter of casual observation that economic advances are more frequently traced to big business than to firms in atomistically competitive industries. He reasons that in the rapidly changing conditions of a capitalist economy, investment in innovation requires some sort of hedge against losses. Protection from competition also allows firms "to gain the time and space for further

development<sup>[30]</sup>". Finally, and perhaps most important, the prospect of earning more than an ordinary return permits innovators to secure the financial backing of capitalists and to bid productive resources away from their current use<sup>[31]</sup>. A monopoly position secured through patent protection thus may increase rather than restrict the use of known technologies by facilitating the commercial introduction of such technologies by innovating firms. The Schumpeterian theory, while supplying a basis for believing that patents serve some ongoing function even after inventions have been made, nonetheless offers little guidance in assessing the proper role of patents in subsequent research<sup>[32]</sup>.

### The Prospect Theory

Edmund Kitch offers a more elaborate analysis of the role of patents in post-invention innovation in what he calls the "prospect theory" of patent protection<sup>[33]</sup>. According to this theory, the patent system promotes efficiency in the allocation of resources to the development of existing inventions by awarding exclusive, publicly recorded ownership in new technological "prospects" shortly after their discovery<sup>[34]</sup>. Kitch contends that patents promote efficiency in the use of resources to develop patented inventions in part by putting patent owners in a position to coordinate subsequent research and development efforts. Since the owner of a patent has the exclusive right to exploit the technology defined in the patent claims, no one else is likely to invest in developing this technology without first making arrangements with the patent owner; otherwise, the subsequent researchers might ultimately be unable to benefit from their own investment in development for lack of a license to the underlying patented technology. The patent owner is thus in a position to cause researchers to share information and thereby avoid duplicative research efforts. In the absence of a patent, different investigators might try independently to develop the same invention in secrecy, each working without the benefit of the knowledge gained through the efforts of the others. Exclusive rights in technological prospects thus promote efficiency in research after the patent

<sup>26</sup> Powell, "Nature of Patent Right", 17 COLUM. L.REV.663(1917).

<sup>27</sup> Robert P. Merges, "Of Property Rules, Coase, and Intellectual Property", 94 Colum. L. Rev. 2655, 2662-63 (1994)

<sup>28</sup> Joseph Schumpeter, *Capitalism, Socialism and Democracy*, Harper and Row, London 3<sup>rd</sup> ed, 1950, p. 81-110.

<sup>29</sup> Carolyn. S. Solo, "Innovation in the Capitalist Process", A Critique of Schumpeterian Theory", 65 Q.J.Econ 417 (1951).

<sup>30</sup> F. Granville Munson, "Control of Patented and Copyrighted Articles after Sale", The Yale Law Journal, Vol. 26, No. 4. (Feb., 1917), pp. 270-290.

<sup>31</sup> Donald S. Chisum, The Patentability of Algorithms, 47 U. Pitt. L. Rev. 959, 1017 (1986)

<sup>32</sup> Michael P. Ryan, the Function-Specific and Linkage-Bargain Diplomacy of International Intellectual Property Lawmaking, 19 U. Pa. J. Int'l Econ. L. 535, 565 (1998)

<sup>33</sup> Edmund W. Kitch, "The Nature And Function Of Patent System", 20 J.L & Econ 265-278 (1977).

<sup>34</sup> Michael P. Ryan, the Function-Specific and Linkage-Bargain Diplomacy of International Intellectual Property Lawmaking, 19 U. Pa. J. Int'l Econ. L. 535, 565 (1998)



issues by putting the patent holder in a position to monitor and control such research [<sup>35</sup>].

Kitch finds support for the thesis that patent rights play a significant role in the ongoing development of patented inventions in two features of the patent system. First, the patent statute authorizes and promotes patent protection at an early stage in the development of new inventions, making it likely that further research will remain to be done in order to develop an invention during the term of the patent [<sup>36</sup>]. According to Kitch, inventions are commonly patented long before it becomes commercially feasible to exploit them [<sup>37</sup>]. The inventor who delays filing a patent application while continuing to develop the invention may lose the right to patent protection entirely if in the interim the inventor makes a public use of the invention or begins to exploit it commercially in secrecy; or if the invention is described in the literature or used by others, if intervening progress in the field makes the invention obvious or if a competitor files an earlier patent application on the same invention [<sup>38</sup>].

Second, Kitch asserts that the patent monopoly is generally not limited to the primitive version of the invention described in the patent application, but extends to subsequent refinements as well. Subsequent improved versions of the invention falling within the scope of the patent claims and newly discovered uses for the invention, although the product of further research by others will still be subject to the control of the patent holder until the patent expires [<sup>39</sup>]. The patent holder will therefore stand to benefit from subsequent research to improve the invention, while other researchers will have little incentive to pursue further research on a patented invention without first arranging for a license to the underlying patent. Kitch argues that taken together, these features of the patent system tend to promote control over subsequent research on patented inventions by patent holders and their licensees, and that such control promotes efficiency [<sup>40</sup>].

<sup>35</sup> John C. Stedman, "Invention and Public Policy", Law and Contemporary Problems, Vol. 12, No. 4, The Patent System: 1. (Autumn, 1947), pp. 649-679.

<sup>36</sup> Mark A. Lemley, The Economics of Improvement in Intellectual Property Law, 75 TEX. L. REV. 989, 993-95 (1997)

<sup>37</sup> Arthur M. Smith, "Recent Developments in Patent Law", Michigan Law Review, Vol. 44, No. 6. (Jun., 1946), pp. 899-932.

<sup>38</sup> Alfred E. Kahn, "Fundamental Deficiencies of the American Patent Law", The American Economic Review, Vol. 30, No. 3. (Sep., 1940), pp. 475-491.

<sup>39</sup> A. Samuel Oddi, The International Patent System and Third World Development: Reality or Myth? *Duke Law Journal*, Vol. 1987, No. 5. (Nov., 1987), pp. 831-878.

<sup>40</sup> Turner, The Patent System and Competitive Policy. 44 N.Y.U. L. REV. 450, 453-55 (1969);

### Implication for Limitation to Patent Monopoly under These Theories

On analyzing the above theoretical justification for patent rights, it is crystal clear that, they in no way support any kind of limitation to the patent monopoly, either prior to the grant or after the grant. Reducing the strength of patents would reduce incentives to make and disclose new inventions and that; conversely, increasing the strength of patents would increase incentives to make new inventions and to patent them in lieu of protecting them as trade secret [<sup>41</sup>]. To the extent that an experimental use exemption or a similar fair use facilitates the development of alternative technologies to compete with a patented invention or a public purpose without compensating the patent owner, it would shorten the expected duration of the patent holder's effective monopoly, thereby reducing incentives to invest in the commercial development of the existing patented invention [<sup>42</sup>]. Moreover, the loss of royalties that might otherwise be collectible from exploitation of patent right would reduce the value of patent monopolies, thereby weakening incentives to innovate [<sup>43</sup>]. Thus these theories are simply ardent supporters of absolute monopoly.

It is from the criticism developed against these theories that we get a rationale for limitation to absolute monopoly. Challenges to the patent monopoly have taken a variety of forms. The most fundamental objection is that subjecting new inventions to monopoly control restricts their use and thereby reduces the social benefits of patented invention. Another objection to the incentive to invent justification is that patent incentives may distort economic activity in ways that undermine efficiency. For example, competing firms hoping to make patentable inventions ahead of their rivals in order to win lucrative patents may spend too much money trying to develop inventions quickly, when the same result could be achieved at less social cost through a less accelerated research effort [<sup>44</sup>]. The patent system may divert too many resources away from productive activities in which returns are limited by the forces of competition, or it may divert resources from research in fields where patent protection is unavailable to research

<sup>41</sup> Greer, The Case Against Patent Systems in Less-Developed Countries, 8 J. INT'L. & ECON. 223 (1973);

<sup>42</sup> Scherer, "Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions", 55 AM.ECON. REV. 1097 (1965),

<sup>43</sup> Teece, Technology Transfer by Multinational Firms: The Resource Cost of Transferring Technological Know-how, 87 ECON.J. 242, 242 (1977).

<sup>44</sup> Stumpf, Interests and Conflicts of Interest in Technology Transfer-The Role of Patents, 9 INT'L REV. INDUS. PROP. & COPYRIGHT L. 309, 315 (1978).

that is more likely to yield profitable patent monopolies<sup>[45]</sup>. Finally, some writers have argued that the patent system may hinder progress through its effects on the research efforts of persons other than the patent holder. The existence of a patent may undermine the incentives of these other persons to make improvements in patented technologies <sup>[46]</sup>.

Economists have questioned whether patents in fact promote disclosure of inventions that would otherwise be kept secret. Secrecy is not always a practical strategy for protection, and often secret technologies can eventually be uncovered through reverse engineering <sup>[47]</sup>.

Where long term secrecy is feasible, patent protection for a mere seventeen years might not be an attractive alternative. Moreover, any technology that can be exploited in secrecy by its inventor can probably also be exploited in secrecy by an infringer, making a patent on such an invention difficult to enforce <sup>[48]</sup>. Finally, some people have questioned whether patent disclosures in fact convey enough information to be useful to the public. The proposition that patents promote disclosure of new inventions by rewarding those who disclose their inventions in patent applications is thus open to doubt on a number of grounds<sup>[49]</sup>.

## CONCLUSION

Thus we can see that absolute monopoly will in course of time be a social burden, since there are chances of misuse of monopoly, waste of resources and a disincentive to innovation from a larger public out of fear of infringement and costs of licensing. Further the grund norm on which we are granting the monopoly; the “patent disclosure” has also in practical experience found to be inadequate for the purpose of adequate

disclosure of the invention <sup>[50]</sup>. But it is an interesting aspect that, however individualistic or egocentric these theories appears to be; the monopoly they are propagating is for the purpose of promoting inventions and innovations to suit the larger social interest.

Advocates of exemptions to patent rights highlight the adverse effects of patents, which fall into a number of categories: deadweight losses, transaction costs and fundamental uncertainty <sup>[51]</sup>. They contend that the patent system is a necessary evil; not that it should be abandoned, just that its negative effects be attenuated. Exemptions assist in this regard by acting like a subsidy, in that they provide relief from the imposition of monopoly prices <sup>[52]</sup>. Thus in course of time legislators framed patent monopolies with sufficient leeways to suit the larger public interest. First we can look into the various free rider uses to the patent rights <sup>[53]</sup>, before going to the historical evolution and comparative analysis.

<sup>45</sup> Haar, *Revision of the Paris Convention: A Realignment of Private and Public Interests in the International*

*Patent System*, 8 BROOKLYNJ. INT'L L. 77, 91-100 (1982)

<sup>46</sup> Henry, “Multi-national Practice in Determining Provisions in Compulsory Patent Licenses”, 11 J. INT'L. & ECON. 325 (1976).

<sup>47</sup> Robert P. Merges, “Commercial Success and Patent Standards: Economic Perspectives on Innovation”, California Law Review, Vol. 76, No. 4. (Jul., 1988), pp. 803-876

<sup>48</sup> Edmund W. Kitch, “The Law and Economics of Rights in Valuable Information”, The Journal of Legal Studies, Vol. 9, No. 4, The Law and Economics of Privacy. (Dec., 1980), pp. 683-723.

<sup>49</sup> Richard C. Levin, “A New Look at the Patent System”, The American Economic Review, Vol. 76, No. 2., (May, 1986), pp. 199-202.

<sup>50</sup> Partha Dasgupta; Joseph Stiglitz, “Uncertainty, Industrial Structure, and the Speed of R&D”, The Bell Journal of Economics, Vol. 11, No. 1. (Spring, 1980), pp. 1-28

<sup>51</sup> Aditya Nagarsheth, “Experimental Use Exception: An International and Comparative overview with a Possible Answer to The Forthcoming Indian Patent Legislation”, JIPR Vol.9, 2004, p.519.

<sup>52</sup> [http://www.wto.org/english/tratop\\_e/trips\\_e/pharma\\_at\\_o186\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/pharma_at_o186_e.htm)

<sup>53</sup> For a detailed view see, [www.unctad.org/Garrison%20-%20Patent%20Exceptions%20DC%20-%20Blue%2017](http://www.unctad.org/Garrison%20-%20Patent%20Exceptions%20DC%20-%20Blue%2017).