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LAS PATENTES Y EL DESARROLLO ECONOMICO

OR

PATENTS, PROGRESS, PROSPERITY

I. INTRODUCTION

National patent systems are continuously molded by the economic, political and social forces that prevail in nations. In modern times national systems are established and maintained to provide an incentive to innovation in technology. Appropriately, these systems not only promote innovation but also serve to recognize and honor innovations and innovators. The system of the granting of patents by the state has a very long history, and today's national and international patent structures and infrastructures have formed from centuries of evolution and debate. The grant of "monopoly" power has always been and probably always will be a controversial subject.

The system of patents for inventions did not really flourish until the advent of the industrial revolution and even then their number was very limited.

The growth in the numbers of patents made the grant of patents by special acts of the legislatures impractical and the nineteenth century saw the development of formalized national legal systems for the administrative issuance of patents. A disclosure of the invention with subsequent publication thereof became standard. National

patent offices were established and the procedures for obtaining patents in the industrialized countries developed into formal rules centering on what was and what was not patentable. Patent offices became the most complete repositories of literature on technology existing throughout the world.

The need for some international coordination of national patent laws and comity of nations in this field became a pressing problem as trade among nations became freer and international investments in technology expanded. In 1883, 10 nations signed the Paris Convention which after exactly one hundred years still serves as the fundamental instrument for controlling the rights to patent protection in member countries for non-nationals. Over the ensuing years other nations proceeded to establish systems for patents on inventions and to join the Paris Convention and today about 90 nations adhere to that Convention. Established patent systems continued to be refined in many countries.

By the beginning of the twentieth century, the modern world patent system was basically in place. But it really wasn't until after World War II that reform and change in national and international systems became major social, economic and political issues. There was an explosion in research and development followed by a corresponding explosion in technical literature. Technology transfer between nations played an increasingly larger role in world-wide technology development.

II. THE U.S. PATENT SYSTEM AND ITS REAPPRAISALS

As is well-known, the United States instituted a strong patent system in 1790, which was shortly after the foundation of the nation. The modern United States Patent System, which was established by Congress in 1836, has remained a fairly stable system since that time. It has served as the model for patent systems of many countries. Its principles have been sustained up to the present time despite numerous attacks by its critics. It has developed mostly in the application of those principles in the changing economic and social times of the United States mainly through judicial decisions rather than legislative enactments. The 1953 revision of the United States Patent Law represented primarily an update and re-affirmance by Congress of old principles in the law.

The United States was the leader in this technology explosion and in technology transfer to other nations, but few outside of industry and the patent bar attributed any major supportive role to the patent system in the success of the United States in achieving this technological pre-eminence in the world. Liberal economists, with their innate aversion to monopoly, continued to question the theory of the system in creating incentive for industrial growth. Antitrust critics still misapprehended the distinction between the patent privilege or property that added something new to a nation's commerce and true monoplies, which took something away from a nation's trade and commerce.

By the middle 1960's many were saying that the system is failing and unworkable in a modern, industrial society. A Presidential Commission on the Patent System was appointed by President Johnson in 1966 to determine what is the basic worth of the Patent System in the context of present day conditions. The Commission undertook an extensive analysis of the United States Patent System and foreign patent systems and concluded that "a patent system today is capable of continuing to provide an incentive to research, development, and innovation. They (the Commission) have discovered no practical substitute for the unique service it renders." More particularly, they held:

> "First, a patent system provides an incentive to invent by offering the possibility of reward to the inventor and to those who support him. This prospect encourages the expenditure of time and private risk capital in research and development efforts.
>
> Second, and complementary to the first, a patent system stimulates the investment of additional capital needed for the further development and marketing of the invention. In return, the patent owner is given the right, for a limited period, to exclude others from making, using or selling the invented product or process.
>
> Third, by affording protection, a patent system encourages early public disclosure of technological information, some of which might otherwise be kept secret. Early disclosure reduces the likelihood of duplication of effort by others and provides a basis for further advances in the technology involved.
>
> Fourth, a patent system promotes the beneficial exchange of products, services, and technological information across national boundaries by providing protection for industrial property of foreign nationals."

Although legislation was introduced in the U.S. Congress as early as the middle 1960's to implement needed reforms in the Patent System, it wasn't until 1980 after much national debate and, more importantly, after public recognition of a decline in industrial innovation in the United States, that real legislative action was considered to strengthen the system. This decline in industrial innovation brought about a renewed public and political interest in the late 1970's in the American Patent System. There appeared to be a correlation between the decline in innovation and the level of patent activity by American inventors. The Patent System suddenly found more popular support in many circles in and out of government as an important incentive to industrial innovation and growth.

A second Presidential Commission was appointed in 1978 to study this decline, and this time it no longer questioned the role of the Patent System in supporting industrial innovation. Rather, it concluded that no major overhaul of the system was needed and merely voiced its concern about certain shortcomings.

III. ECONOMIC EVALUATION OF PATENTS

Shortly after I entered the patent field in 1957, the famous (infamous?) "Melman Report" came out and I became concerned about the future of a patent career. Professor Melman had reviewed the Patent System for the U.S. Congress as had Professor Machlup and both came down hard on the Patent System, to say the least.

Professor Melman answered the question whether the Patent System still fulfilled the Constitutional purpose of promoting science and the useful arts, in the negative and added that in the future "the main impetus for promotion of science and the useful arts will come, not from the patent system, but from forces and factors that lie outside that system." (S. Melman, "The Impact of the Patent System on Research", U.S. Senate Study No. 11, Washington, Government Printing Office (1958) p. 62)

And Professor Machlup's oft-quoted conclusion:

> "If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it." (F. Machlup, "An Economic Review of the Patent System," U.S. Senate Study No. 15 Washington, Government Printing Office (1958) p. 80.)

But the Patent System has survived Professors Melman and Machlup and other like-minded critics and is going strong indeed. Criticism of the Patent System, certainly from economists' quarters in industralized countries, has become much less strident and acrimonious though it has not completely subsided.

Studies of and proposals for alternatives to patents as incentives were made time and again but again the Patent System survived them as, in the final analysis, the very best and most viable time-honored alternative itself. For instance, another Congressional Study (Gilfillan, "Invention and the Patent System", Joint Economic Committee, Washington, Government Printing Office, 1964) which the author ambitiously called a "first appraisal" of the Patent System, identified "15 or so rival institutions" and proposed additional ones, in particular a "new institution" which

> "would avoid almost all the shortcomings of the existing systems, and support invention much better than ever before, with unlimited funds, and guidance for social welfare, yet with direction by businessmen, through licensed, nonmonopolistic, semi-public trade associations, which would acquire universal membership through gaining control of all good patents, through being granted them on better terms than to non-cooperating inventors." (P. 9)

But it is noteworthy that even this proposed "new institution" is based on patents and involves patent pools.

Mr. George Frost also scrutinized the various alternatives and finding them wanting concluded that it is "exceedingly doubtful that... intense research and new product competition would continue in the absence of a patent system" and that "patent system incentives will have an important place in stimulating business enterprise to create technology and - perhaps more important - to apply it." ("Patents & Progress", Richard D. Irwin, Inc., Homewood, Illinois, 1965, p.84) Incidentally, Frost had previously authored Senate Study No. 2 on "The Patent System and the Modern Economy" (Washington, Government Printing Office, 1957) and in it he stated - which is as valid today as it was then - that

> "It ought not to be necessary endlessly to defend the patent system against the stigma of 'monopoly,' when it is in fact a source of competition. It should not be assumed that every time an excuse is found to invalidate a patent, competition somehow necessarily benefits. It ought not to be necessary to indulge in endless argument over whether the patent laws or the antitrust laws ought to prevail when both serve the same end of maintaining competition and we should be looking for ways to make both more effective."

Most recently, Prof. Dr. Carlos Fernández Novoa of Santiago de Compostela, in the book "Hacia Un Nuevo Sistema de Patentes" (Editorial Montecorvo, S.A. 1982) has dealt with and rejected alternative systems, notably a governmental monetary award system. "... el Sistema de Patentes es el único sistema de incentivar la investigación technológica que es conciliable con el sistema de economía de mercado." (P. 32)

In addition to considerable criticism of the Patent System on the part of economists, complaints were the order of the day that the Patent System had really never been studied in depth to answer such questions as to whether the economic benefits derived from the Patent System outweighed its costs. However, in more recent times empirical studies and mathematical models have been made and have provided previously-absent evidence regarding the economic value of patents.

A very fresh double issue of the Quarterly Journal of the American Patent Law Association on the "Economics and the Patent System" (Vol. 10, Nos. 1 and 2, 1982) is "must reading" in this respect, according to its Editor. It includes articles by two distinguished economists, i.e. Prof. E. Mansfield ("Patents, Innovation and US Technology Policy") and Prof. F.M. Scherer ("Research and Development Expenditures and Patenting"). Additionally, it deals with such topics as "Does the Patent System Have Measurable Economic Value?", "The Patent System - An Underused Weapon in the Economic Arsenal", "The Worth of Patents...(in) the Electronic Industry", "Patents in the Petroleum Industry" and "Drug Innovation and Patents". The last-mentioned article was contributed by Dr. E. M. Jucker of Basle, Switzerland, who of course is the well-known apologist and defender of drug patents and author of the "Patents - Why?" booklet, both of which contain a plenitude of concrete and detailed charts

and data on the economic function of patents in the pharmaceutical field. In the light of his exposition and presentation, I subscribe whole-heartedly to his conclusion that

> "drug innovations take place mainly or only in countries with strong patent protection, and it is, therefore, an illusion to expect that erosion of the patent system would improve in one way or another the drug supply to the masses. Health for all depends on therapeutic possibilities, and therapy is based on new, life-saving drugs. Production and availability of these drugs is intimately linked with patents and it would be much wiser to improve the patent sytem than to weaken it." (Quarterly Journal, p. 96)

In fact to the extent it is conceptually possible I would like this booklet to be incorporated herein or appended hereto and this goes also for the APLA Quarterly Journal.

IV. KEY ELEMENTS OF A STRONG PATENT SYSTEM

What kind of patent protection will provide the greatest incentives for

a) domestic research and development with the aim to achieve useful innovations;

b) productive investments and thus economic progress;

c) international technology transfer often coupled with investment ventures? I submit that it will not be a patent system which is overly restrictive in terms of patentable subject matter and patent duration, on the one hand, and overly liberal in terms of compulsory licenses, forfeiture, and other sanctions for non-working, on the other hand. Rather, it will be a patent system that provides patent protection for the widest scope of subject matter categories, including in particular in the field of chemistry, and more particularly also in the fields of agricultural and medicinal chemistry and microbiology, not only manufacturing processes but also uses and applications, compositions and formulations, living organisms and, most importantly, chemical substances or compounds per se. Patent protection for processes of manufacturing chemicals is inadequate even with the legal safeguard of the reversal of the burden of proof because it is so easily circumvented and because it places emphasis on the development of new processes to make known products rather than synthesis of new substances.

It will also be a patent law that does not envisage sanctions for non-working in any form or only under very special circumstances. Provisions for compulsory exclusive licenses and for premature forfeiture or revocation as remedies for non-working as per recent proposals for revision of the Paris Convention are especially abhorrent and repugnant and counterproductive. Such a patent law will also countenance effective and prompt enforcement of patent rights against infringement including also contributory infringement.

Furthermore, a patent system that provides adequate incentives for research and development, investments and technology transfer, is one that is not niggardly when it comes to the duration or life of a patent, that is to say, one that will provide more, or ideally much more, than fifteen years, rather than less. Five-year terms as exist now in some national laws are completely inadequate as an incentive mechanism even if they are extendible for another five-year period because extension possibilities are narrowly circumscribed. And wasn't there a recent enactment of a one-year patent term in Costa Rica?!

As regards patent term, I personally feel that a 25-year patent life would be "more like it". In fact, a legislative proposal for such a term across the board is now being readied for introduction in the U.S. Congress. This is apart from or in addition to pending "Patent Term Restoration" bills which would extend the term of a patent for up to seven years to compensate for the delay caused by governmental premarketing and regulatory review requirements which is a serious problem in the pharmaceutical and pesticide industries.

According to the May 1983 issue of Intellectual Property Notes "some inventor groups are interested in enlarging the period of patent protection to 25 years" because "nearly everyone possessing rights under patents is experiencing difficulties in commercializing an invention." Industry spokesmen also have started advocating 25-year terms. For instance, at the LES International Conference in San Francisco last October, Fred Hartley, Chairman of Union Oil Company, made the following plea:

> "... I would like to present you with an important challenge which deserves the support of your organization. Many of you are familiar with the efforts of the drug industry, supported by other groups as well, to obtain passage of the Patent Term Restoration Act, H.R. 6444, that seeks to extend the term of patents whose use is delayed by regulatory body approvals. The time has come to seek longer life on patents that protect massive, long lead-time investments in all industries.
>
> We see today in refining and petrochemical plant projects delays of up to five years and more for environmental permits, construction lead times of three to five years and commitment delays caused by patent interferences. Those factors can be beyond our control and can easily consume half or more of a patent's useful life.
>
> Corporate industrial research already is impaired and will suffer further serious reverses unless management can see better returns on high-cost creativity. I urge all of you LES members, therefore, to take the leadership in restoring an appropriate value and an appropriate life to hard-earned United States patents." (LES Nouvelles, March 1983, p. 27)

In his oral presentation, as I recall it, he suggested "for starters" an increase from "17 to 25 years".

In fact, it is interesting that voices are starting to be heard that the life of a patent actually should endure for at least fifty years. See W. Schickedanz, "Are 20 Years of Patent Protection Enough?", GRUR, Sept. 1980, p. 828; T. Haffner, "The Short Patent Life - An Injustice and Block to Innovation...", PERFORMING ARTS REVIEW 9, 1979 p. 389 and M. Elphick, "Patent Laws Are Behind the Times", ELECTRONIC DESIGN 6, March 15, 1979, p. 75. Their arguments, in brief, are that many inventions, especially pioneering inventions, are ahead of their time and become commercial only after patent expiration and the distinctions between artistic creation and scientific invention are becoming blurred and hence inventors are being discriminated against vis-a-vis authors.

If the industrial working of a patented invention is feasible and comtemplated in a given country, an inevitable prerequisite for entering into often risky investments and technological cooperation is the building-up of a market under the umbrella of an issued patent. Absence of protection, excessive shortening of patent terms or immunity for infringing imports would thus be damaging. Full protection from grant to expiration of the patent is consequently a prerequisite for the acquisition and working of technology and supplementary know-how.

In this connection, a statement made by Dr. G. Gansser of CIBA-GEIGY Basle at the 1977 WIPO Symposium in Colombo is worth repeating:

> "Admittedly, the effect of patent exclusivity is a cost element in a system providing for a contribution to a return on present or future investments in research and manufacture; but in most cases competition by substitution of equivalent products from sources not controlled by patents is possible, as patent claims provide only temporary cover for specific products and/or processes. The incorporation of price policies in patent laws has, in practice, turned out to be an incomplete and inefficient measure in any case. It is therefore inconsistent and incompatible to allow patents as a vehicle for industrialization and, simultaneously, to undermine their effect, in order to generate more price competition, by freedom for imports or by mandatory import licenses."

V. JAPAN AND CANADA - A REVEALING CONTRAST

According to a booklet entitled "The Story of the United States Patent Office" (1972), published by the U.S. Department of Commerce, K. Takahashi, the founder of the Japanese patent system, during a visit to Washington, D.C. to study the American patent system in or around 1900, stated:

> "We (Japan) have looked about us to see what nations are the greatest, so that we can be like them.... We said, "What is it that makes the United States such a great nation?" and we investigated and found that it was patents, and we will have patents."

Indeed, the reception of foreign technology and the development of domestic industry in Japan coincide with the establishment of the patent system through a series of enactments and amendments to model the law after the systems of developed countries. The year of 1899 is particularly important since it was in this year that the foundation of the present patent system was laid and Japan joined the Paris Convention for the Protection of Industrial Property.

The history of the patent law in Japan can be used to show that limiting patent protection to the processes for producing chemicals and pharmaceuticals may be inadequate to encourage the transfer of foreign technology. The first patent law in Japan was passed in 1885, and it provided that any new and useful process or product could be patented. In 1888, the Government of Japan acted to prepare a better law, and many improvements in

the law were made; however, food and drinks and methods of preparing medicines and drugs were excluded from the scope of patent protection. In 1899, additional amendments and changes were made to the patent law, and the Patent Law of 1899 (Law No. 36) has remained the basis for the patent system in Japan up to the present time. By subsequent amendments to the law, chemical compounds per se were excluded from patentability, but a method of using a chemical compound per se or a chemical formulation was retained. Finally, in 1975, Japan amended its patent laws again to permit the patentability of chemical substances as such.

The patent protection given to the chemical arts resulted in the rapid progress of technology and the development of the Japanese economy in the chemical industry, particularly in the period following the end of World War II. Although chemical compounds per se were initially patentable, those were excluded from patentability with the amendment of 1921 to the patent law for fear that such broad protection for foreign inventions would result in domination of the chemical industry in Japan. Methods of use, however, which were relatively easy to examine, were permitted to encourage the importation of chemical technology from overseas companies, since it was also feared that providing inadequate chemical patent protection would not attract such

technology. Over the years, the law was interpreted in such a way that by 1975, almost equivalent protection was provided in many cases as would be obtained from granting patents on chemicals per se. Hence, the legislative amendments to the law in 1975 permitting the patentability of chemicals per se were not a radical change in the scope of protection provided by the law.

Thus, the development of the chemical industry in Japan, compared to the development of the chemical industry in many other developing countries over the last 75 years, can be attributed to the scope of protection given to the chemical arts by granting patents on method of using chemical compounds and chemical formulations, in addition to granting patents on methods of preparing chemicals.

Under the old patent law (before 1976), many researchers and industrial firms concentrated their creative efforts upon the discovery of new processes for which they could obtain patent protection, as well as devoting their endeavours to finding new chemical and pharmaceutical compounds.

However, the case was a little different in the field of processes of producing antibiotics by using miccroorganisms. That is to say, the Japanese Patent Office, in granting a patent for a process invention in this field, had a choice between granting broad "genus" coverage and granting narrow "species" coverage with regard to microorganisms to be used in the process.

After due deliberation, the Japanese Patent Office decided to grant process patents with broad coverage. This resulted in bringing about an incentive to activities of researchers expecting extensive and considerable patent protection which was substantially equivalent to product protection.

As is well known, in Japan, many new antibiotics, such as Kanamycin, Fradiomycin, Trichomycin, Leucomycin, Sarkomycin and Mitomycin were discovered, and even more, the technical level in the technology of fermentation in Japan increased rapidly and significantly.

In recent years, various derivatives of penicillin and cephalosporin which are very efficient were discovered in Japan, some of which have been exported to foreign countries, either as products or as technology or know-how. As a result, those products made an appreciable contribution to the economy of Japan.

The discovery of many new and useful antibiotics in Japan is to be attributed chiefly to patent incentives and our Japanese friends in the Pacific Industrial Property Association believe that this example from the antibiotics field is proof positive that the creation of inventions is stimulated in a situation where patent protection is strong and adequate.

Looking at it differently, S. Matsui, in an article in the Journal of the Patent Office Society (59 JPOS 612, 622) made the following interesting point:

> "... foreign enterprises could export their superior technology to Japan without worry under the strong protection of the patent law on the one hand and the domestic firms could foster their own technological resources by working such inventions, sometimes under the assistance of the foreign firms on the other hand. The result is that the Japanese now have a basic power to develop high technology on their own in various fields of technology and, in an increasing number of cases, are now able to export their technology to (even) developed countries."

Note also the presentation by Y. Takahashi et al. in the June 1980 LES Nouvelles issue (p. 119) about Japan serving as a model of success for other Asian countries and playing a pivotal role as a motivator of technology transfer in Asia.

In this connection it is of interest to recollect comments I made here in Madrid during the last LES Conference when I delivered a paper on "reverse technology transfer" to the effect that "the switch from developing to developed countries which is fast coming about also in Asian/Pacific countries such as Korea, Taiwan, Singapore, is taking place without any resort to such restrictive practices as are prevalent in Latin America" and that, especially with reference to Mexico and Brazil where technology export to other developing countries and even developed countries

has become a significant practice and truly multinational companies have emerged, restrictive patent and technology transfer laws and regulations would come back to haunt them. (See LES Nouvelles, March 1980, p. 25.)

In Canada, by contrast, according to a recent CHEMICAL WEEK issue (May 19, 1983, pp. 3, 45-46), drastic legislation that requires compulsory licensing of drug patents (Section 41) for paltry royalties is "driving out the multinationals".

The controversial legislation was introduced in 1969, following studies by the Canadian government of consumer drug pricing. The studies concluded that pharmaceutical companies had substantial market power and used it to obtain high prices for their products.

Now, Canada's climate for pharmaceutical companies has become so inhospitable that some multinationals are pulling up stakes. American Home Products' subsidiary, Ayerst, McKenna & Harrison, has closed its research laboratory in Montreal, at least in part because of Section 41. Hoffman-La Roche is shutting down Canadian production of pharmaceuticals and will export to Canada from the U.S. and Europe. In the end, Canada could lose as much as $75 million/year (Canadian) that is invested in pharmaceutical research and development.

Editorializes CHEMICAL WEEK:

> "Those moves could well presage a mass exodus of the major pharmaceutical companies from Canada. That would strip the country of any substantial pharmaceutical research effort by the big multinational companies - an effort that should play an important role in Canada's aspirations to expand its scientific industrial base.
>
> Such an exodus would also mean that eventually the country would have to import worthwhile new drugs, and the national drug bill would soar. By causing higher, not lower, drug prices, Section 41 as it now stands may well turn out ultimately to be self-defeating."

There is hope for change, however. The federal Cabinet is now considering modifying this controversial provision of the Canadian Patent Act and other federal departments, less preoccupied with consumerism and more concerned with economic development and scientific research, also have been eager for a change. Now a more recent issue of CHEMICAL WEEK (June 8, 1983, p. 21) confirms that a change in the Act is forthcoming. "The industrial and scientific communities have called for a repeal of the measure, blaming it for the departure of pharmaceutical research and production facilities from Canada. Andre Ouellet, minister of consumer and corporate affairs, says that new measures will be written into the law that will serve to balance the interests of consumers against those of the multinational drug companies."

VI. CONCLUSION

In conclusion, industrial innovation in any country is very dependent upon the integrity of the patent system. Industrial innovation requires risk capital and substantial outlays for research and development. But risk must have its reward. And if the reward is not commensurate to the risk, the risk will not be taken.

No businesspeople worth their salt will make a commitment to research and development without reasonable assurance that they will be able to reap the fruits of what they have sown. A government patent historically has been the mechanism whereby society has provided a measure of protection and some guarantee of reward for technological innovation. Put your money and talent to work, develop something new, and your government will protect your rights in the property you have created. This is the essence of the patent system. Obviously, it is a powerful and necessary incentive to technological growth.

Professor Friedrick-Karl Beier, at a FICPI World Congress in Santiago de Compostela in October 1978, summed it all up in a stately manner as follows:

"...the patent system, in its historically developed and currently practiced form, constitutes a proven, indispensable instrument for technical economic and social progress. It must certainly be constantly adapted to new developments and the current state of the knowledge but there is no need for a basic revision, changing the foundations of the patent system itself.

. . . . . .

Today more than before, all countries, not only the countries of the third or fourth world are dependent upon the transfer of technology. No country, not even the United States or Japan or West Germany, can have the lead in all fields of technology. Without an international division of labor and collaboration in research, development and production, it will not be possible to guarantee technical, economic and social progress in our divided world, and for this progress, patent protection is needed today as much as it was in the past."

Karl F. Jorda

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