



Intellectual Property Policies

for the Twenty-First Century:

The Japanese Experience in Wealth Creation

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POLICY ADVISORY COMMISSION  
OF THE WORLD INTELLECTUAL PROPERTY ORGANIZATION





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# Table of Contents

Foreward	7
Introduction	9
<i>Chapter 1</i>	
Evolving Patent Rule: The Patent Y2K Problem	11
<i>Chapter 2</i>	
Patents and the Intellectual Creation Cycle	15
<i>Chapter 3</i>	
The Undermining of the Patent System: When Companies Shop Around	25
<i>Chapter 4</i>	
Corporate Patent Strategy	33
<i>Chapter 5</i>	
University Research as a Hotbed of Basic Technology Patents	55
<i>Chapter 6</i>	
A Global Patent Scenario	59
<i>Chapter 7</i>	
The Patent Information Highway	67
<i>Chapter 8</i>	
Broader and Stronger Protection for Intellectual Property Rights	73
<i>Chapter 9</i>	
Creating a Patent Market	79
<i>Chapter 10</i>	
Intellectual Property Law in the 21 <sup>st</sup> Century	85
<i>Chapter 11</i>	
The Outlook for Patent Attorneys	93
<i>Chapter 12</i>	
Reforming Patent Administration	97
Epilogue	101
About the Author	107

## Acronyms used in this book

CAFC	Court of Appeals for the Federal Circuit
CVCC	Compound Vortex Controlled Combustion
EPO	European Patent Office
GII	Global Information Infrastructure
IMF	International Monetary Fund
ISDN	Integrated Service Digital Network
ITC	International Trade Commission
JPO	Japanese Patent Office
MIPAS	Mitsubishi Patent Administration System
OECD	Organization for Economic Cooperation and Development
OHIM	Office for Harmonization in Internal Markets
OTC	over-the-counter
RCAST	Research Center for Advanced Science and Technology
SCIT	Standing Committee on Information Technology
SME	Small and Medium Enterprises
TLO	Technology Licensing Office
TRIPs	Trade-Related Aspects of Intellectual Property Rights
USPTO	U.S. Patent and Trademark Office
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

## Foreword

The author of this book, Mr. Hisamitsu Arai, Vice-Minister for International Affairs, Ministry of International Trade and Industry of Japan, is one of the leading thinkers working in intellectual property issues today. He has had a great deal of experience as an administrator, having been involved in a large number of international trade negotiations, including the World Trade Organization/Uruguay Round and the preparation of draft policies in the high-technology manufacturing industry. In recent years, as the Commissioner of the Japanese Patent Office, he has been responsible for the domestic reform of patent administration, and has offered a great number of suggestions on the new role that the World Intellectual Property Organization (WIPO) should play in this era of globalization and rapidly-advancing information technology. Following my inauguration as Director General of WIPO, a Policy Advisory Commission was established as one of the advisory bodies that provides expert opinions on WIPO's intellectual property policies. Mr. Arai was one of the founding members of this Commission.

This book covers a wide range of topics, describing how Japan introduced the patent system over a century ago, and used the system as a major tool in the development of its economy. It also discusses how patent strategy has changed in companies in recent years, and what kind of patent administration should be implemented in the future. While this book offers Mr. Arai's suggestions on intellectual property policy to the world, it also acts as an important source of reference on intellectual property policies in various countries. Unfortunately, not many books have been written on intellectual property policy. I believe that the timing of the publication of this book is auspicious, coming during a period of considerable economic change.

With this perspective in mind, Mr. Arai's book has been published as one of a series of studies conceived and initiated by the Policy Advisory Commission.

I truly hope that this book will be widely read and become a source of discussion on intellectual property policy in the 21<sup>st</sup> century.

Dr. Kamil Idris,  
Director General, WIPO



# Introduction

As Sony co-founder Masaru Ibuka remarked upon being awarded the Japanese Order of Culture, “Inventions are the fount of culture. They are essential to any culture’s development. There have been many significant inventions throughout the course of history - among them the ancient inventions of the water clock and paper-making, the invention of the printing press in the Middle Ages and, more recently, Edison’s phonograph and the steam engine, which powered the industrial revolution. All of these inventions have had a profound impact on the course of human civilization and sparked great cultural development.”

Sakichi Toyoda, widely acknowledged as one of Japan’s top ten inventors of all time for his invention of the world’s best automatic looms, was very offended by American policies to exclude Japanese in the early decades of the 20<sup>th</sup> century. Commenting on these anti-Japanese policies, he said ruefully, “What have the Japanese contributed to the building of modern civilization? The Chinese invented the compass, but the Japanese have invented nothing. That is why the Americans see Japan only as a copycat nation.” Believing that Japan had to produce outstanding inventions, to demonstrate to the United States that the Japanese also possessed very capable intellects, he donated large sums of money to the Japan Institute of Invention and Innovation to promote the invention of efficient storage batteries. Indeed, it was his belief that inventing useful technologies and obtaining good patents contributed to the advance of civilization – and that patents are thus the foundation of civilization.





# 1

## Evolving Patent Rule: the Y2K Patent Problem

Everyone knows about the Y2K problem as it affects computers and information technology. When the last two digits of the year change from 99 to 00, some computer systems will interpret this as 1900, and not as 2000. This could cause major disruptions in airline flight control, in financial and accounting systems, and throughout the whole of society. The year 2000 will also be crucial for the patent system, but for different reasons.

### 1.1 TRIPs

The Y2K patent problem is not a computer problem. Rather, it is an issue linked to the conclusion of the TRIPs (Trade-Related Aspects of Intellectual Property Rights) Agreement, under the Uruguay Round of multilateral trade negotiations, and the establishment of the World Trade Organization (WTO).

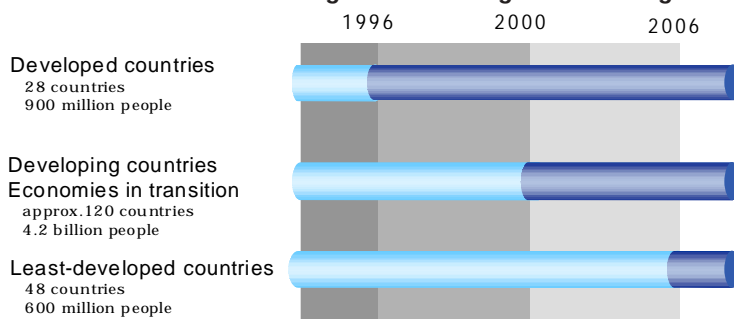
As the name implies, the TRIPs Agreement is an international protocol on the treatment of intellectual property rights and provides for the exclusion of countries from the global free trade system if they do not respect patent rights. Seeking to further develop the global economy, nations have agreed to lower their tariff rates, ease import restrictions, and otherwise facilitate the trade in goods. At the same time, progress has been made in liberalizing the trade in financial and other services, and minimum rules agreed upon for the protection of patents and other intellectual property rights.

The TRIPs Agreement also sets a schedule for implementation. Under this schedule, Japan and the other developed countries have agreed to afford full patent protection as of January 1996. These countries - the members of the Organization for Economic Cooperation and Development (OECD) - have a total population of about 900 million, and these 900 million people have been at the heart of the worldwide patent system to date.

Yet starting in the year 2000, much of the rest of the world - the 120 countries and their 4.2 billion people that are the emerging markets, developing countries, and economies in transition - will also be expected to provide patent protection. Thus, even countries such as Russia and China, which are not yet WTO members, are doing their utmost to put their patent systems in order and to modernize their examination infrastructures, so that they will be able to meet their obligations starting in 2000.

The next group of countries will be the least-developed countries, which will be expected to offer full patent protection starting in the year 2006. These 48 countries have a total population of about 600 million. (Chart 1.1)

**Chart 1.1 Schedule for Phasing in the TRIPs Agreement Obligations**



Given a total world population of about 6 billion, this means that the patent system, as implemented so far by the industrial 15%, will be extended to 90% of the world in 2000. This is a giant step for the global patent system - a step with major significance - for it tells all countries that want to trade with the rest of the world that they will have to provide patent protection. Even countries that used to see patents as public assets, to be drawn upon as much as possible, will now have to provide patent protection. Patents will be protected worldwide, and efforts are being made throughout the world to put the necessary legal infrastructure in place.

## 1.2 Being more Patent-Minded

Part of this involves making people more patent-minded. In the past, there were people in the developing countries who argued that the industrial countries should supply them with environmental protection technologies free of charge.

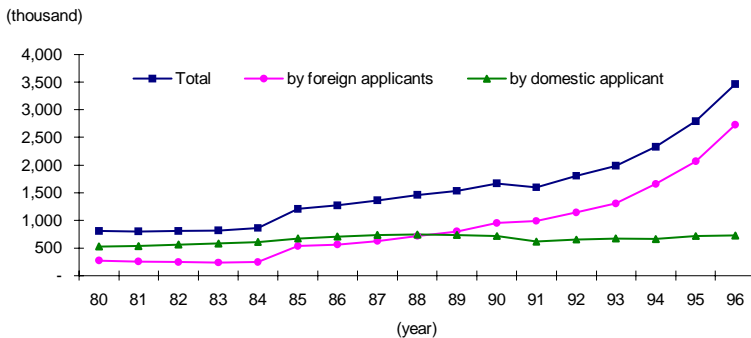
But now, people understand that they will not have any access at all to foreign technology if they do not respect patent rights.

Executives at a leading Chinese environmental research institute, for example, have remarked that, "China welcomes foreign firms as active participants in the Chinese environmental business sector, including measures to prevent air pollution and to provide for the safe disposal of urban waste. Yet there are many problems that China must resolve before we can expect strong foreign participation. Among them, it is essential that we develop a better understanding of intellectual property rights, including the need not to infringe on foreign firms' patents."

With the globalization of business, there has also been striking internationalization in the world of patent protection. In 1985, there were 1.2 million patent applications filed worldwide. By 1995 this was 2.79 million. The number of patent applications had more than doubled in only a decade.

Domestic patent applicants – where Japanese are applying for Japanese patents or Americans applying for U.S. patents, for example - stayed relatively stable at about 0.72 million over the course of the decade. By contrast, applications by foreign inventors rose fourfold in the same decade, from 0.5 million in 1985 to 2.07 million in 1995. (*Chart 1.2*)

**Chart 1.2 Patent Applications**

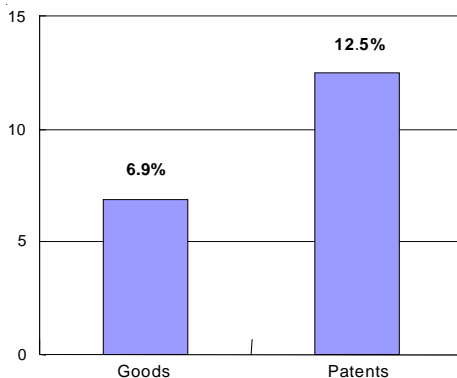


Source: *Statistics of WIPO*

International Monetary Fund (IMF) data include statistics on both the trade in goods and the trade in patents. Looking at these statistics shows that the trade in goods - which includes imports and exports of automobiles, color televi-

sion sets, and other “things” - enjoyed average per-annum growth of 6.9%. By contrast, the trade in patents grew an average of 12.5% per annum, or nearly twice as fast. (Chart 1.3)

**Chart 1.3 Growth of Trade in Patents and Goods**



Source: *Balance of Payments Statistics, International Monetary Fund*

Note: Figures are average per-annum growth for 1988-96

In monetary terms, the trade in goods was worth about 4.6 trillion dollars and the trade in patents worth about 50 billion dollars in 1996, or only about 1% of the goods trade. But if the average patent royalty is calculated at 5%, this would mean that patent trading actually accounted for 20 times the patent amount - or a total of 1 trillion dollars by value. Although it is largely invisible, the international patent trade is clearly crucial to the world economy.

How will the worldwide patent situation change in the year 2000?

# 2

## Patents and the Intellectual Creation Cycle

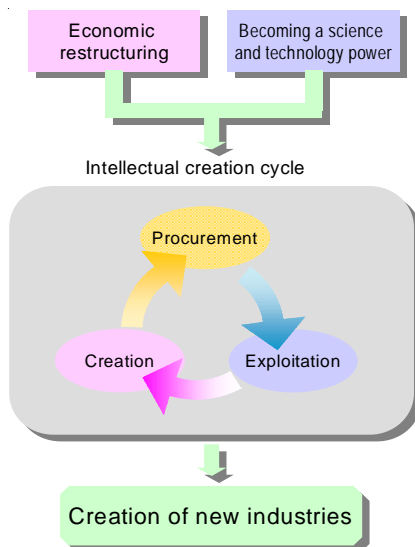
### 2.1 An Age of Intellectual Creation

What will the 21<sup>st</sup> century look like? Most likely it will be an age of intellectual creation, as people use their creative energies to come up with new goods and services. At the same time, it will be an era in which the patent system is used to ensure that the inventors share in these advances and that the concepts involved are made available to society at large.

The Japanese economy is currently in dire straits - mainly because it is mired in the Herculean task of cleaning up after the bursting of the bubble created when people were more interested in real estate investments and other "get-rich" financial wizardry than they were in finding ways to turn out better products at lower cost. Japan thus faces an urgent need to restructure its economy. As part of this, a Science and Technology Basic Law was enacted in 1995 as one step on the way to making Japan a powerhouse in science and technology.

Very simply stated, it is hoped that this law will foster an intellectual creation cycle in which, when someone develops a new technology, patent protection is established for the inventor's rights, these rights are used to make and sell a better product, and the resultant profits help fund research on the next new technology. If this cycle can be established, it will have a snowball effect. Whole new industries will be created and venture businesses, on the American model, will be able to thrive in Japan. Patents are the key to this process. (*Chart 2-1*)

Of course, as with anything else, there are pro-patent people and anti-patent people in Japan. The antis have a dislike of the entire patent concept and do not think that patents accomplish very much good. By contrast, the pro-patent people believe that patents offer important protection and incentives to people who innovate, and thus help to generate a variety of new technological advances. Today, the pro-patent forces are rightly in the ascendancy, worldwide.

**Chart 2.1 Intellectual Creation = New Industries**

## 2.2 The Networked Society

Computers are now commonplace, and everyone seems to be on the Internet. Indeed, we are in the midst of an information revolution comparable to the ancient agrarian revolution and the more recent industrial revolution. This new revolution is not over yet, and everyone expects further advances in information technology. As part of this on-going revolution, all manner of information is being put into digital form and then being uploaded to global computer networks so that anyone, anywhere, can access it almost instantaneously. New information thus becomes a shared resource, worldwide.

Looking ahead, further advances are in store for the social and technological structures used for creating, storing, and sharing information. Computers, for example, are now far more than number-crunchers and have been developed into systems for processing and conveying information.

This information revolution will inevitably impact our patent systems. For one thing, patents will be less concerned with physical "things" and more with intangible "concepts." In genetic engineering, for example, patents have been sought on DNA sequences, in which computer technology has been used to do the sequencing. Science and technology is expanding beyond the realm of physical objects and moving increasingly into the way in which they are used, covering ab-

stract concepts that cannot be seen or held. With this change, the scope of patents has also become more receptive to software and other intangible information concepts. Diagrams that used to be drawn by hand are now computer-generated. Experiments and proofs that used to be painstakingly compiled are now based upon computer simulations.

The second major change is in how patents are handled. The basic process is still that the patent application describing the new scientific or technological advance is filed with the Japanese Patent Office (JPO), the information is opened to the public, and the application is examined.

Yet the greater use of computer technology has fundamentally changed the actual handling. It used to be that the claim was written out on paper and the paper documentation was submitted to the JPO for examination. Today, the application is submitted as computer data. At the same time, an application no longer has to be brought in person or sent in by post. Instead, the applicant can get on-line and upload the application directly to the JPO. In turn, the JPO can contact applicants on-line.

In the same way, the public disclosure of patent information no longer has to be done with paper documentation. Instead, the contents can be uploaded to the computer network and made available there. Not only does this vastly simplify the process, it also makes it possible for people to access the information, no matter where in the world they happen to be. Consistent with this broader disclosure, researchers can now run computer searches to locate and download the latest technological information. This is a major impetus for more rapid advances in science and technology.

The advent of computerized networking has had major ramifications for patent administration, patent applicants, would-be patent users, and everyone else with an interest in accessing patent information worldwide.

The third major change on the horizon is that the 21<sup>st</sup> century is likely to be an era of increasing e-commerce. It is expected that the use of computers will vastly facilitate a wide range of transactions and business relationships. At the same time, it will open the way for easier copying and rearranging of data that has been put into digital form, and it will make it easier for anyone to generate and transmit such data. This has been a subject of intense discussion within the World Intellectual Property Organization (WIPO), because it is so important that the underlying technology be patent-protected, if e-commerce is truly to develop. Very rapid advances are being made in e-commerce systems, and patent protection is essential to encouraging such progress. At the same time, the spread of e-commerce means that more and more information will be transmitted worldwide, which underlines the need for greater protection for the intellectual property rights embedded in that information.

## 2.3 Patents Support Venture Start-Ups

The Japanese economy is being transformed. After World War II, Japan developed the ability to turn out top-quality products inexpensively, and became the world's factory. Yet even as Japanese technology improved, currency fluctuations and technological advances enabled other Asian countries to use their abundant labor to produce plentiful manufactures for global export. As a result, Japanese industry became undermined. Color television sets, video-cassette tape decks, automobiles and other products were increasingly being made in other countries.

This is a time of transition for Japanese industry. Looking just at manufacturing, 4.6% of all companies fold every year. By contrast, the rate of new company start-ups is only 3.1%. More firms are closing than are being created, and unemployment is on the rise. Faced with increasingly stiff global competition, major companies are having to restructure with a vengeance. Thus, companies listed on the major stock exchanges are cutting their staffing by 3.1% per annum. By contrast, the newer and nimbler companies in the over-the-counter (OTC) market are expanding their staffing by 3.2%.

What is to be done? In the past, some might have looked for financial answers, but it was the infatuation with financial instruments and wizardry that led to the bubble economy and its disastrous aftermath. It is clearly essential that Japan develops new industries, based upon new technologies, to produce world-class products of unquestioned value. And experience has shown that such new industries can best be created, not by giant companies building upon their established lines, but by university researchers, small and medium enterprises (SMEs), and individual inventors, pooling their creativity to come up with new ideas and new products. Expectations are thus high for Japanese start-up ventures.

### Patents: Linking Technology, People, and Capital

Japan needs to foster greater entrepreneurship and the creation of new industries if it wants to break out of its current malaise and lay the foundations for the new millennium. But what is needed to encourage entrepreneurship and start-up ventures? There are three main factors.

The first thing is the new technology needed to enable the start-up company to produce new products. New technology can be likened to the seeds for new products, and the supply of this vital ingredient is crucial.

Second is the need to bring together outstanding people who share the dream of a better future. It is thus important to encourage greater cooperation between industry and academia and to instill a greater sense of entrepreneurial opportunity in all students.

Third is the need for capital, to ensure that the effort can go smoothly. Because this means procuring capital for projects that are just getting started, and may entail considerable risk, it is essential to attract money from a wide variety of sources and to mobilize all manner of private-sector funding.

It is patents that link these three elements - technology, people, and capital. Once a new technology is patented, it is possible for ordinary investors to assess the technology's merits and its potential. The patented technology is granted protection from knock-off or copycat technologies for 20 years. During this time, new products can be commercialized and the fledgling company can become well established, enabling investors to feel secure in buying the new firm's shares. And in the quest to assemble a strong team, the quality of applicants' patents is an important indication of their potential contribution to the venture. Thus, patents are an important means of linking technology, people, and capital.

Given that, how have patents actually been used in the establishment of start-up ventures in Japan?

### **Sakichi Toyoda: Japan's Premier Entrepreneur**

Japan is home to many venture start-ups, but perhaps one of the most successful has been the Toyota Group. It was Sakichi Toyoda who planted the seeds that grew into today's Toyota Group. When the Japanese Patent Office commemorated its 100<sup>th</sup> anniversary in 1985, it drew up a list of Japan's top ten inventors of all time. Sakichi Toyoda led the list. His patent, (JP 1195, B) for an automatic loom, was crucial to Japan's development and provided a major impetus for its industrial revolution.

Sakichi Toyoda was born in 1867. Even as a child, he was very interested in inventing things. When imported machinery was being used widely throughout Japan, he developed a wooden loom powered by human muscle, as part of an effort to enhance the productivity and quality of the looms then in use and to get Japanese textile firms to use Japanese machinery.

In 1886, when he was going to night school, he heard of the new patent system that had been established the previous year. "This," he thought, "is a system designed to protect Japanese inventors. With these new rules, nobody can come along and steal a new invention that you have worked so hard to perfect. This is a system that will allow inventing to flourish in Japan. What a great idea!"

Even before he knew of the patent system, Toyoda had been working on developing his improved loom, but the system inspired him to new heights. He patented his new loom and then, building upon this foundation, began work on developing a machine-driven loom, starting with a machine-driven wooden loom and then moving on to a fully automatic version. This loom was able to hold its

own against the best that the rest of the world had to offer, and it was not long before he started exporting the equipment. Toyoda was one of the first Japanese to earn royalties from his patents.

Eventually, he had 84 patents and 35 utility model registrations. He was one of the first Japanese entrepreneurs to recognize the importance of patents and it is no exaggeration to say that patents changed his life.

### **Konosuke Matsushita and the Matsushita Socket**

Konosuke Matsushita is another outstanding example of Japanese entrepreneurship. Even though he never got beyond elementary school, it was a diligent inventor and smart businessman who founded the Matsushita Group (Panasonic). Starting with his 1917 utility model registration for the Matsushita socket (a screw-in socket adapter that could take two light bulbs), he formed his own company to manufacture sockets. This company grew into Matsushita Electric Industrial and then blossomed into the Matsushita Group. Among Matsushita's many patents - about 100 in all - are the two-bulb screw-in socket, a battery-powered light for bicycles, an automobile headlight, and a square light bulb.

Matsushita had a very difficult youth. At 15, he went to work for Osaka Electric Light, working his way up from the line to become an inspector. It was while he was working as an inspector that he became acutely aware of the extra time and trouble involved in connecting to sockets, and realized the need for improved equipment to boost the factory's productivity. Thus it was that he set to work improving the socket. It was early in the 20<sup>th</sup> century that he learned the importance of patents.

Matsushita drew dozens of diagrams of sockets and produced large numbers of prototypes. It was a long and arduous process of trial and error before he hit upon the idea of a socket in which it was not necessary to wrap the wire around a screw. He took the idea to his superiors at Osaka Electric Light, but they only scoffed at it. So he decided to quit Osaka and set up his own company to manufacture the new sockets. But before he did that, there was one more thing he had to do - he had to file an application with the JPO to show all the world that he was the one who had thought of this improved socket. All too often, after someone has sweated and slaved to come up with a new invention or product, a larger company with greater capital resources moves in and steals the idea. The better the invention, the greater the danger; and the Patent Law is the inventor's only protection against such theft. Even though most people were then unconcerned with such matters, young Matsushita was very aware of this system's importance and promptly set to work drafting his patent application. The application was accepted by the JPO and four months later, in January 1917, Matsushita was notified that his new

patent had been granted. Only then did he quit Osaka Electric Light and devote himself to manufacturing the improved socket.

Even today, Matsushita companies carry on their founder's awareness of the importance of patents, and are active in filing applications and obtaining patents.

### **Masaru Ibuka: Student Inventor**

Masaru Ibuka is famous as a co-founder of Sony. Yet he was also a good inventor, with 50 patents and 53 utility model registrations to his name. When Ibuka was still a student in the Waseda University science department, he was absorbed in research on changing the frequency of light with sound or an external voltage - work that led to the invention of a "running neon light" and a patent for a device to change the frequency of light rays. This neon light was demonstrated at the Paris Exhibition of 1933 and won a prize as one of the most outstanding inventions shown. A student who obtained outstanding patents, Ibuka was famous at the JPO as "the student inventor." In today's terms, his was a prime example of spinning off university research for commercial applications. Yet Ibuka was very much the exception, and there were few students who obtained significant patents at that time.

Following graduation, he planned to go into business for himself and to continue to pursue his technological bent and his interest in developing new ideas and concepts. During the war, he had to work on military research, but the specifications that came down from military headquarters were extremely detailed and left virtually no room for the technical people to exercise their ingenuity. This was a source of great frustration and in 1946, right after the war ended, Ibuka was quick to move - to establish Tokyo Tsushin Kogyo, predecessor to today's Sony.

Ibuka continued inventing for a long time. The next thing he invented and commercialized was an electrical heating unit. This sold very well, but the company later discontinued production, fearing that the lack of proper insulation and a thermostat might make it a dangerous product.

What really attracted global attention was that Ibuka was first in the world to use the transistor in an electrical appliance designed for ordinary household use. At the time, transistor production technology was still primitive, yield rates were very low, and transistors were not commercially produced. Even in the United States, they were only used in military equipment where cost was not a factor. Yet Sony acquired the rights to use the transistor technology. Again, this was very much like Ibuka - wanting to acquire the best technology no matter where it had been invented.

At the time Sony acquired the rights to the transistor, it was generally thought to be unsuitable for consumer products. But Sony applied its creativity and ingenu-

ity to the problem. Ibuka looked at the poor yield figures and decided that the first step was to improve production yields. He clearly had the engineer's mindset, and soon devised the necessary technical improvements to make it possible to use the transistor in general consumer products.

Ibuka produced Japan's first transistor radio, the world's first solid-state television, and numerous other innovative products which Sony then produced and marketed. Another project that took much of his time and energy was the development of the first tape recorder to be made in Japan. In a very real way, Sony was one of Japan's first postwar start-ups, and Ibuka was instrumental in making it a true multinational company. The development of color television technology was particularly arduous. Yet the company's very survival was at stake, and he pushed himself as hard as he pushed the rest of the technical staff, until they finally developed the Trinitron technology.

Even as a student, Ibuka had recognized the importance of patents. He was determined that Sony products should embody Sony technology and that their company would grow into a world-class organization. It is no exaggeration to say that this student inventor built Sony into one of the world's leading corporations. He was a co-founder, imbued with the spirit of the entrepreneur and fascinated by technological innovation. Even after he became president of the company, he declared that curiosity and the thirst for knowledge were the company's most important manufacturing resources. Ibuka wanted to be able to go down to the shop floor at any time, with the result that he always wore work clothes, not only in his office but even when he was meeting people from outside the company. Indeed, this was a tangible representation of his desire to never leave the world of technology, invention and patents.

### **Soichiro Honda: Inventor in the Shop**

It was Soichiro Honda that Ibuka looked up to, as his surrogate older brother. Although Honda was only an elementary school graduate, he was very interested in technology, had a passion for inventing, and developed a number of world-class products. Using his patents as the foundation, he put a small start-up company together and was determined from the very first to make the world his marketplace. Honda is another of postwar Japan's pre-eminent success stories.

Founding his company in 1948, Honda started by putting a small military-surplus engine onto a bicycle. He attached an old metal hot water bottle as a gas tank and was on the way to producing mopeds. From that, he moved up to motorcycles and started to develop the best motorcycles in the world.

Early in his career, Honda set himself the goal of winning the world's most prestigious motorcycle races. At the time, there were about 100 Japanese compa-

nies making motorcycles, and Honda was one of the smaller ones. It was obvious that, if they expected to win, they would have to build better motorcycles. This meant getting complete combustion, to provide greater fuel efficiency. They asked around at universities all over the world, but nobody was studying gasoline combustion.

Pleased to find an opening, Honda set to work on combustion research. They studied spark plugs, valves, air/fuel mixture ratios, and everything else. This was pioneering research, and it contributed significantly to enabling Honda to sweep all five TT races on the Isle of Man in 1966 and to demonstrate Honda's technological supremacy. Honda also did important research and development into the metals used in motorcycles, and he later had the distinction of being the first Japanese to be made a life member of the American Society for Metals.

All the while, he was working on developing a lightweight motorcycle for the consumer market, and the result was the Super-Cub that Honda marketed so successfully. This lightweight motorcycle was very popular, not only in Japan, but also overseas, and it became a worldwide best seller. Spurred by Honda's success, the other motorcycle companies stepped up their research and development efforts until the Japanese industry was the global pacesetter.

Following the company's success with motorcycles, Honda went into passenger cars. In 1966, he took the initiative by becoming the first company to start work on meeting the stiff emission regulations, designed to cut down on air pollution. At the time, the U.S. Big Three automakers and the main Japanese automobile companies were saying that it was technologically impossible to meet the proposed standards. But Honda said, "This is when we should show them what we can do. I want us to be first in the world to meet the standards." Driven by a sense of mission "for mankind's sake," Honda startled the rest of the world when it became the first to develop a compound vortex controlled combustion (CVCC) engine, which provided low emissions and good mileage. When other automakers came to Honda seeking to license the technology, Honda declared that air pollution was not just a Honda problem - it was a global problem - and quickly made the technology available to other companies, to help curb automotive exhaust emissions.

Over the course of his life, Honda was awarded 115 patents and 359 utility model registrations. Among his many famous comments regarding inventing are:

- "Inventing is pure sweat. But thinking of new things is a joy."
- "Man is an animal who evolves and progresses through inventions."
- "Go to the shop floor. Use your hands, your body, and your mind. If you do, wisdom will follow."
- "Doing things yourself: that is crucial to inventing."

- "Patents are a blend of ideas and timing."
- "The world of invention is a world of pain. Yet it is the exquisite pain of achievement."

Even today, Honda's spirit lives on in his company, and the company has continued to grow, through technological innovation and patents, until it now has sales of about 27 billion dollars per annum and employs nearly 29,000 people.

## 2.4 Patents' Asset Value

What is the total asset value of all Japanese patents? The total asset value for all of Japan, measured in terms of national wealth, is estimated at about 29 trillion dollars. Because the asset value of patents is not included in this figure, it has to be calculated from total spending on research and development and other relevant data - which gives a rough value of 872 billion dollars. This is equivalent to about 3% of national wealth.

In the past, national wealth was generally said to be largely the total value of land, but people no longer believe that land prices will go up forever and Japan has gone off what might be called the land standard. It is thus crucial for Japan that it further enhances the value of its patent assets.

# 3

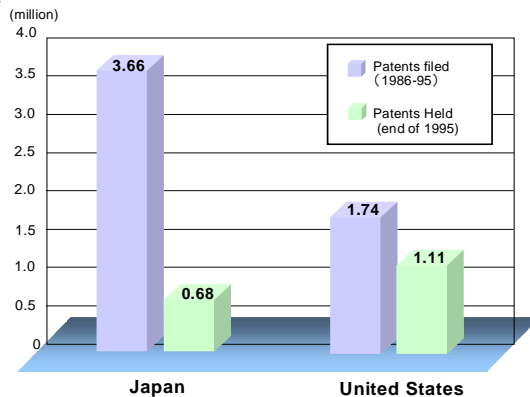
## The Undermining of the Patent System: When Companies Shop Around

### 3.1 Patent Undermining

Japan has so far been considered a “great power,” in patents, but there are definite fears that this position is being undermined. Given that patents will become increasingly important in the new century, this is a grave concern.

In the decade 1986-95, the Japanese filed approximately 3.66 million patent applications - more than twice the 1.74 million applications filed by Americans. Japan was truly a “filing great power.” Of course, not all patent applications are granted and some are abandoned as unnecessary, even after they are granted. Looking therefore at the total number of active patents, at the end of 1995 the figures were, 680 thousand for Japan and 1.11 million for the United States - virtually a reversal of the two countries’ positions on filings. (Chart 3.1)

**Chart 3.1 Applications Filed vs. Patents Held**



Source: Statistics of WIPO, Trilateral Statistical Reports

It is possible to include a number of inventions in a single patent filing document. Looking at the number of inventions per filing, the ratio is 3:1 in the United States' favor. Putting these numbers together, the United States holds a 6:1 edge over Japan in the number of active patent inventions. In terms of active patent inventions, the United States is a far greater "real-life patent power" than Japan.

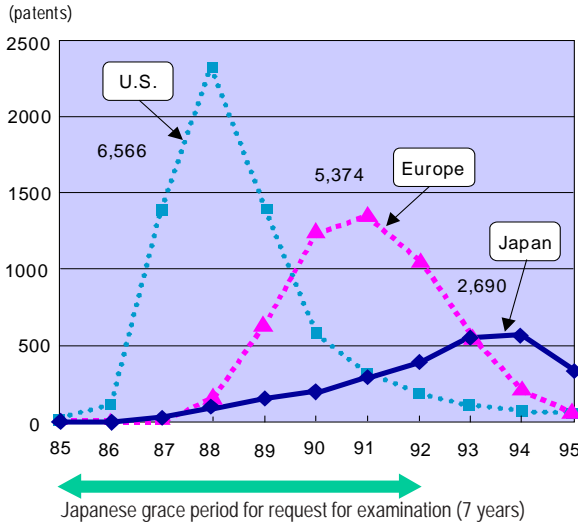
How are we to account for this disparity between Japan as the filing power and the United States as the active patent power? There are several reasons. One is the different length of time it takes to get a patent. In 1985, there were 5,900 patent applications that Japanese firms filed with the JPO, with the U.S. Patent and Trademark Office (USPTO) and with the European Patent Office (EPO). It is interesting to track these applications and to see what became of them. Among the many provisions of patent law is one allowing for "divisional" application - dividing a single patent application into multiple applications. When this happens, the number of patents can end up being greater than the number of applications filed. In the United States, the initial 5,900 Japanese applications resulted in 6,600 patents being granted in the ensuing ten years. In Europe, 5,400 patents were granted and in Japan, only 2,700. Thus, Europe granted only 80% and Japan only 40% as many patents as the United States did, from the same 5,900 applications.

The second reason is speed. For these same 5,900 applications, the peak period for granting patents was 1988 in the United States, 1990-91 in Europe, and 1993-94 in Japan. In other words, the United States was the fastest to grant patents, doing it in about three years. Europe was next, taking some five years, and Japan was the slowest, taking seven years on average. At present, the standard patent term is 20 years from the date of filing. The earlier that patents are granted, the longer their useful lives and the greater the stock of live patents. (*Chart 3.2*)

The reason that the U.S. turnaround is so quick is that the U.S. does not require requests for examination, but puts applications into the pipeline for examination as soon as they are received. Europe, like Japan, requires that, after an application is filed, the applicant must request that the application be examined and the patent granted. However, the applicant in Europe is required to make the request for examination within two years of filing the application. In Japan, the equivalent figure is seven years.

There are those who argue that more patents are granted overseas because patent examiners in other countries are not as rigorous as they are in Japan. Yet the truth is that, once a patent has been granted in the United States, it is possible to do business, including entering into international licensing agreements, based upon the patent's having been granted. There is really no need to obtain multiple-country patents. If countries recognize each other's examination results, who is to say one is more or less rigorous than another?

**Chart 3.2 Patent Acquisition**



Source: Compiled by the JPO from Derwent information

- Notes:
1. This figure is a comparison of the patents acquired in Japan, the United States and Europe and is based upon the 5,926 applications filed by Japanese in the three jurisdiction in 1985.
  2. The year of patent acquisition is taken for the year of publication of examined application in Japan. When multiple patents resulted from a single filing, each of the patents is counted in the year it was granted.

At the same time, once a company has obtained a U.S. patent and commercialized the product, there is no need to go through the process and commercialize it again in Europe and Japan. Thus, there are a number of companies that have decided to skip obtaining European and Japanese patents. The United States is fastest to grant a patent and Japan slowest - and the United States grants the most patents and Japan the fewest.

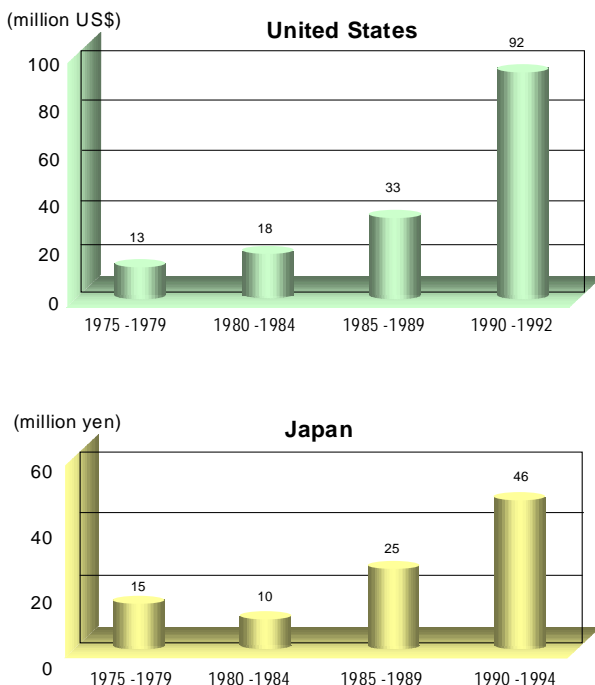
### 3.2 Legal Undermining

Court cases generally arise within the same national jurisdictions in which the trouble arises, such that one would not expect legal problems. Yet the Japanese situation has been undermined from a legal point of view when it comes to patent

disputes. When a patent has been granted in both Japan and the United States, the same patent dispute could be taken to court in either Japan or the United States. This is a feature distinctive to patent disputes, and differentiates them from commercial or property disputes.

Generally, the company that feels its patent has been infringed upon will elect to bring suit in the jurisdiction where it feels it will have the advantage. American judgments tend to be higher. The average judgment for the main patent cases decided in the United States between 1990 and 1992 was 92 million dollars. In Japan, the average 1990-94 judgment was about 420,000 dollars- only about 1/200<sup>th</sup> of the U.S. figure. (Chart 3.3)

**Chart 3.3 Average Awards in Main Intellectual Property Litigation**



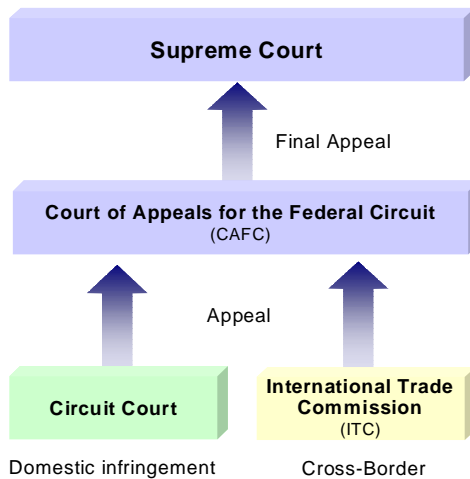
Sources: *Japanese Corporate Intellectual Property Policy Today and Tomorrow*, Nomura Research Institute, 1993, for U.S. figures. *Study with Respect to Proper Civil Remedies for Infringements of Intellectual Property*, Institute of Intellectual Property, 1996, for Japanese figures.

- Notes: 1. Figures for Japan do not include litigation costs  
 2. US\$ is approximately 110 yen.

Even looking at individual judgments, as opposed to averages, Polaroid sued Eastman Kodak for infringing on its instant camera patents and won a judgment of about 1 billion dollars in 1991. By contrast, the largest judgment in Japanese history at that time was the 7 million dollars won by Honda in 1973, when it took Suzuki Motors to court for violating its motorcycle design copyright. This is only about 1/150<sup>th</sup> of the U.S. record. More recently, there was a judgment handing down some 27 million dollars in patent infringement damages in Japan, but this was still very much the exception, and it took 25 years to top Honda's record.

Another factor is that U.S. patent cases proceed quickly to judgment. While an ordinary domestic court case over alleged patent infringement would go to the Federal Circuit Courts, a case involving imports is judged by the International Trade Commission (ITC). Decisions are typically handed down in one year or less. Appeals go to the Court of Appeals for the Federal Circuit (CAFC) - what is commonly known as the patent bench - where they are consolidated and handled by experts, for faster resolution. Appeals beyond that are filed directly with the Supreme Court. (Chart 3.4)

**Chart 3.4 U.S. Patent Dispute Settlement**



Much of this has been dealt with in the media. For example, recognizing the possibility of being awarded not just actual damages but also punitive damages, one major Japanese company charged a number of Korean and Taiwanese companies with patent infringement and took them to court in the United States. With

the recession racking the Japanese and Korean semiconductor industries, there have been a number of Japanese companies that have charged their Korean rivals with patent infringement in U.S. courts. In April 1998, a major Japanese chemicals company took another large Japanese company to court on charges of infringing its wafer material patents - and did it in a U.S. court. In addition, there have also been a number of other cases in which Japanese companies have brought suit against Japanese, Korean, Taiwanese, and other firms in U.S. courts for patent infringement in such areas as film and photocopier drum technology. (Table 3.5)

**Table 3.5 Undermining Patent Litigation**

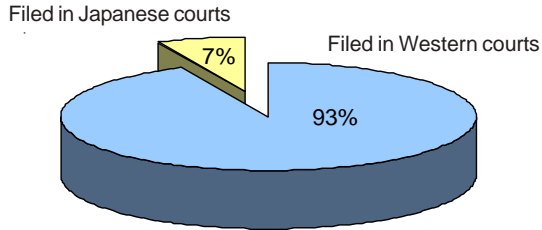
Year	Defendant's nationality	Technology involved	Court involved	
1996	Taiwan	DRAM	U.S.	Federal court
1996	Taiwan	SRAM	U.S.	Federal court
1997	Korea	Semiconductor	U.S.	Federal court
1997	Korea	DRAM	U.S.	Federal court
1997	Korea	DRAM	U.S.	Federal court
1997	Korea	Memory	U.S.	Federal court and ITC
1997	Japan	Purikura	U.S.	Federal court
1998	U.S., China, Korea, etc.	One-time-use camera	U.S.	ITC
1998	Japan, Germany, Taiwan	Photocopier light-sensor	U.S.	ITC

Source: Compiled from press reports

A 1997 study of patent suits filed by Japanese, American, and European firms found that 93% of them were filed in the United States and Europe and only 7% in Japan. If the judgments were equally quick and the awards equivalent, one would not expect such lopsided figures. Yet this 93:7 ratio means that, not only do foreign firms bringing suit against Japanese firms prefer to file in foreign courts, especially in the U.S., but Japanese firms bringing suit against European and U.S. firms are also filing in foreign courts. There is a clear undermining of the legal position underway. (Chart 3.6)

### Chart 3.6 Patent Disputes with Western Companies

Fewer than 10% of patent disputes between Japanese and Western companies are filed in Japanese courts



Source: *Corporate Intellectual Property Right Trends, JPO, March 1998.*

Note: Data on the 164 patent disputes between Japanese and Western companies over the last six years.



# 4

## Corporate Patent Strategy

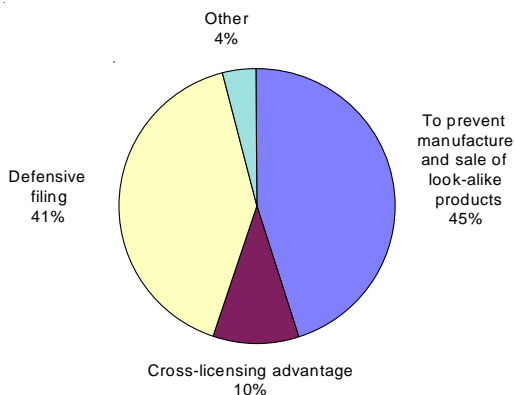
What are Japanese companies' patent strategies? Looking at their reasons for filing, 45% cited the desire to block the development and sale of look-alike products. In effect, they want to keep other companies from making the same things that they are making. This is the traditional reason for obtaining a patent.

Another 10% said that they obtain patents because they expect them to work to their advantage in cross-licensing arrangements. Cross-licensing is often needed in manufacturing sophisticated products. Yet at the same time, the relationships among the parties and patents are not always clear, with the result that companies try to hold as many patents as possible, to strengthen their negotiating hands. In some recent cases, companies have refused to license technology to companies that do not have patented technology of their own to cross-license. It is thus very much to a company's advantage to hold patents on technologies that other companies will want.

In addition, some companies hold patents for defensive reasons. These are patents on technologies that the company does not plan to use itself, but wants to prevent other companies from using. Thus, they file a patent application to stake out a claim, and to keep the technology out of competitors' hands. Some 41% of patent filings are for defensive reasons. Even if Japanese companies obtain good patents, about 65% of these technologies are not commercialized right away. Yet the idea of holding exclusive rights that you do not plan to use runs counter to the spirit of the patent system, and may even be in violation of the Anti-Monopoly Law. (*Chart 4-1*)

### 4.1 Management Strategy

Corporate patent strategy in the 21<sup>st</sup> century has to cover all four bases of management strategy, technology strategy, international strategy, and legal strategy. It is instructive to look first at management strategy.

**Chart 4.1 Why Japanese Companies File Patent Applications**

Source: *Corporate Intellectual Property Right Trends*, JPO, March 1998.

Patents are an important management tool. U.S. companies, for example, have long seen patents as an important weapon in their management arsenal. Patent rights are very useful in corporate management, and good patents can be formidable competitive weapons. Conversely, it may be very difficult for a company to survive if it is the other side that holds these weapons.

There is no point to patents that do not help management. In the United States, management and shareholders alike look first to see if a company's patents are contributing to its bottom line. As such, a company's patent department - which is charged with obtaining and monitoring patents - is moving from being a cost center to being a profit center. Happily, patents are also a form of "goods," and it is possible to earn royalties on both patents and products.

### Hitachi's Patent Strategy

Hitachi earned 455 million dollars in patent royalties in 1996. In the same year, it paid some 91 million dollars in patent licensing fees. Thus, it made a profit of about 364 million dollars that year in its patent trade, and patents made an important contribution to the company's bottom line. Indeed, Hitachi is the Japanese company that has earned the most from patents. Why is Hitachi able to earn so much from its patents?

When Hitachi was founded, its first President, Namihei Odaira, was a firm believer in the idea that "inventions are an engineer's lifeblood," and he made a

strong effort from the very beginning to encourage the company's inventors. Seeking to ensure that Japan had its own technology, invented by its own people, he soon had a staff of specialists working on patents. From the beginning, he urged his technical people to apply their engineering skills to inventing things. He was very much of the opinion that they should devise their own technology, and this same spirit animates the company even today, accounting for its reputation for good technology.

After the Second World War, Hitachi, like everyone else, turned to foreign technology in an effort to close the technology gap. Gaining access to such basic technologies as those used in semiconductor manufacture, computer production, television manufacture, and nuclear power generation, Hitachi worked hard to improve upon these technologies and to develop the ability to compete successfully. And it then aggressively sought to patent these improvements in Japan and overseas.

In 1970 alone, Hitachi filed 20,000 patent applications. All of the company's technical achievements were reported to the patent department, which then checked them and filed the appropriate applications. The emphasis was on sheer number more than the quality of each patent. Of course, Hitachi was not alone, and all Japanese companies competed fiercely in the patent area, each company filing large numbers of applications.

Also in 1970, Hitachi adopted the policy of opening its patents. At the time, the company's patent trade was very much in the red - it earned a mere 5 million dollars but paid out 95 million dollars in licensing fees, putting it about 91 million dollars in the red overall. Hitachi recognized that this situation was untenable and decided that, once it had obtained a patent, it would make the technology available to other companies at a fair price. In part, this would help to recoup some of the massive investment needed to develop new technology. Hitachi was thus the first Japanese company to open its patents to other companies.

The company ran into its first patent problem in 1979, when Westinghouse charged Hitachi, a Hitachi-GE joint venture, Siemens, and a few other companies with patent infringement and petitioned the U.S. ITC to block the import of circuit breakers from Japan. Although Westinghouse had sought to stop imports from Japan on the grounds that Hitachi was infringing on its patents - and although the ultimate outcome was a ruling that the Westinghouse patent was not valid - Hitachi decided to counter-attack by seeing if Westinghouse might not be violating some Japanese patents. Hitachi already had several dozen U.S. patents for electrical power transmission equipment, but it found that they were all patents for features distinctive to Hitachi products and were not the kind of basic patents that other companies would have to use. There were thus no grounds for counter-suing Westinghouse for patent infringement.

This was a bitter lesson for Hitachi, and it initiated a campaign in 1981 to double the number of its strategic patents. Patents are valuable, of course, when the company uses them, but their true value shows up when other companies have no choice but to use them. Hitachi realized there was no point in obtaining a mountain of patents if they were not going to give the company any competitive leverage in crunch situations.

Hitachi then divided its strategic patents into three categories, designated gold, silver, and bronze. Those that other companies could not get around and that covered world-class, basic technology were in the gold category. Hitachi was one of the first companies to recognize the value of strategic patents, to beef up its patent effort, and to make patents part of the overall corporate strategy. As a result, its patent bottom line gradually improved until it went into the black in 1985.

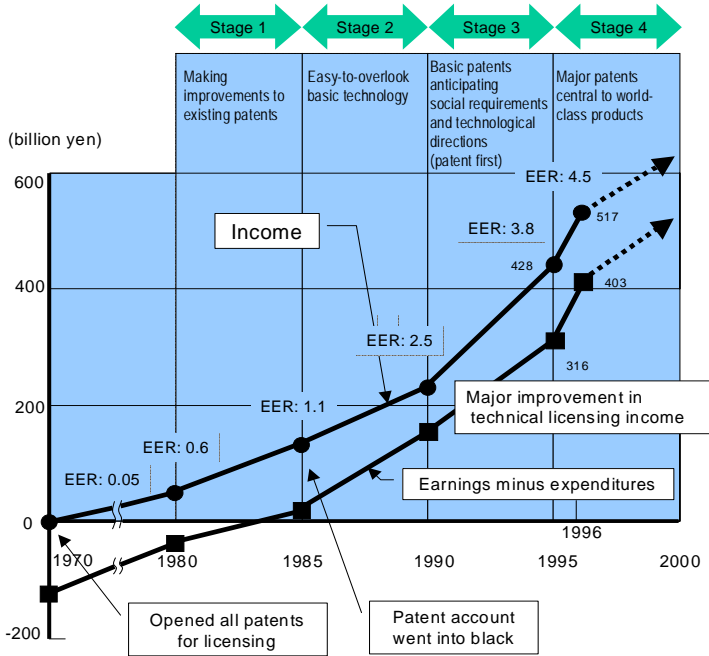
Hitachi's second big patent problem was in 1986, when Texas Instruments sued a total of nine Japanese and Korean semiconductor manufacturers. Although the Japanese companies had signed a contract with Texas Instruments in 1970, to cover patent licenses, the contract came up for its third renewal in 1986 when the semiconductor industry was deep in recession and there was considerable friction between Japan and the United States over semiconductors. In the corporate negotiations, Texas Instruments argued that the licensing fee was too low, that it could not renew the contract on those terms, and that it wanted to set the licensing fee for DRAM manufacturing technology at 10% of sales. It then filed suit with the U.S. ITC and with the Texas courts. Hitachi counter-sued in the Texas courts and in Japan, charging Texas Instruments with infringing upon Hitachi patents. In the end, Texas Instruments had to admit the justice of Hitachi's charges and the two sides settled out of court, at a licensing fee considerably less than Texas Instruments had originally asked. This was a major victory for Hitachi's strategic patent campaign.

In 1985, Hitachi embarked upon its second campaign to double the number of strategic patents. This was a program to patent basic technology that might otherwise be overlooked or taken for granted, and it was crucial to ensuring that Hitachi's patent trade stayed in the black. A third campaign was launched in 1990, to double the number of strategic patents yet again. Working under a "patent first" slogan, this was an effort to patent the basic technology that would be needed to meet emerging market requirements and open up new technology streams. Because it had its own strategic patents, Hitachi was able to beat back a suit by Motorola, which was trying to force Hitachi out of the microcomputer market.

The fourth campaign to double the number of strategic patents was initiated in 1995. This was an effort to gain global patent coverage for the company's world-class products and technologies. Hitachi has worked hard on its patents, and it is

today firmly in the black in its patent trade. This is one company that sees patents as a key managerial resource, to be developed and exploited. (Chart 4.2)

**Chart 4.2 Hitachi's Patent Strategy**



Note: The earnings:expenditures ratio (EER) is calculated by dividing patent license earnings by patent license expenditures.

## Making Patents Available for a Stronger Industry

Momofuku Ando, of Nisshin Food Products, is one person who has succeeded with the strategy of obtaining patents for his instant-noodle processing technology and then licensing that technology to other companies, so that more of them would enter the market and thus cause the segment to grow. Nisshin Food Products is a venture start-up that Ando founded from scratch. After its first success with chicken noodles, the company found that every time it put a new product on

the market, others quickly followed, with look-alike products. The history of the instant-noodle industry is a history of intellectual property rights.

When Nisshin Food Products first rolled out its chicken noodles in 1958, it proved an immediate hit, provoking a spate of copycat, same-name products from other companies. Although Ando was prompt in applying for patents on the manufacturing process and for trademarks and other protection for the packaging, he still found look-alikes from other companies.

The patent on the manufacturing process was finally granted in 1962, making it impossible for other companies to make and sell flavored instant noodles without the permission of Nisshin Food Products. As a result, many of these other companies criticized Nisshin Food Products, accusing it of hiding behind its patents. Obviously, people were still not that aware of the importance of intellectual property rights. This same process was then repeated when Nisshin Food Products came up with its very popular Cup Noodle products. When the company obtained its patent on chicken noodles, it was intending to use the patent to keep other companies out of the market. But it soon realized that it would end up isolated, and ostracized within the industry. It also realized that having a large number of companies competing in the market would cause the market to grow, to everyone's advantage. Just because a process is patented, it does not mean you have to shut it up forever. Rather, the company realized the dangers of becoming complacent if it relied too much on its patent protection and decided to license the technology. Chairman Ando found that licensing was the path to prosperity.

## Seeing Patents as Products and Earning from the Rights

Patents can contribute to a company's bottom line. In fact, those that do not contribute to the bottom line are pretty much useless. It is very expensive to buy technology. When Texas Instruments licensed the Kilby patent for integrated circuits to Japanese companies, Japanese newspapers estimated that, at a 3% royalty fee and with the semiconductor market worth some 25 billion dollars a year, the licensing alone would cost about 727 million dollars a year. Over the 20 year life of the patent, that adds up to about 15 billion dollars. In the United States again, IBM's licensing operations are over 600 million dollars in the black. A world leader in computer-related patents, IBM fully intends to use these rights to further improve its bottom line. There is big money in patents.

There are a number of Japanese companies that have decided to make money by licensing their technology. NEC, for example, has set up an Intellectual Property Division with a staff of 20, and charged it with becoming a patent profit center. At present, NEC is about breaking even on its patent trade, yet it has set itself the target of being 91 million dollars in the black in three years. Fujitsu is another

company that is aware of the value of patents, and it has adopted the policy of aggressively protecting its valid patents and being quick to sue anyone who infringes upon them.

Hitachi has taken the strategic position that patents are products and, as mentioned, earns about 364 million dollars a year from its patents. With a total staff of 350 at the main offices, Hitachi has the largest intellectual property rights department in Japan, and the company is clearly intending to earn from both its patents and its other products, and to set up a positive feedback loop by investing those earnings in still more advanced research and development.

At Ricoh, the target is to have licensing income account for 10% of current income. NTT is stepping up its effort to patent the technologies involved in new telecommunications services. And in the multimedia society of tomorrow, it is likely that even the smallest of services will entail the use of intellectual property rights and will be expected to generate income for the patent-holder.

## 4.2 Technology Strategy

In the race to secure strong patents, there is fierce competition among all players to develop patentable technology. Patents are a crucial part of everyone's technology strategy.

### The Great Mistake by the Father of Television

Just as filing promptly can confer considerable advantages, the failure to file and obtain a patent can prove disastrous. Kenjiro Takayanagi is often referred to as the father of television, but he failed to obtain a patent and paid dearly for his mistake.

Born on a farm in Hamamatsu, Shizuoka prefecture, he dreamed of being able to transmit pictures through the air and intensively researched television technologies. In 1926, when he was still just an associate professor at Hamamatsu Technical High School, he perfected the world's first electronic television. But if you ask most people who made the world's first electronic television, they will tell you it was Dr V.K. Zworykin at RCA in the United States.

Even though Takayanagi was the first to succeed, he did not tell the rest of the world about his accomplishment. He kept it a secret, because he thought that releasing word of his television experiments before he filed for a patent would make it impossible for him to obtain a patent. Thus, it was only in the fall of 1927, a year after his successful experiments, that he filed an application for patents on two methodologies: deflection and synchronization. The reason it took him a whole

year was that he went through a long trial-and-error process of writing the applications and documentation himself, because he did not have the money to pay for professional help. He studied patent law and then studied how to draw up the very detailed documentation that he wanted to submit. He had the final draft copied out by his wife.

But the U.S. practice was to file for a patent on the basis of the idea alone, and not to wait to do experiments or trials. RCA's Zworykin filed for patents as soon as he had the ideas for the iconoscope camera and cathode-ray tube receiver. And he received his patents. Later, Takayanagi realized his mistake, and around 1930 he switched to applying for patents simply on the basis of ideas.

## Patents Encourage Technological Development

The patent system is essential for the generation of new ideas and new technologies. Technological development would not progress in an environment in which people were free to copy every promising idea that came along and if there were no major advantages in having the idea first. This has been borne out by long centuries of experience. Modern patent law is said to have its roots in the 1624 Statute of Monopolies in the U.K. At the time, British technology lagged behind that of continental Europe, and the Statute of Monopolies was enacted to encourage inventors and to enable Britain to catch up. With this patent system, Britain developed its own proprietary technology and commercialized a number of new technologies, including mechanical looms, powered looms and the steam engine. This was the start of the industrial revolution.

The patent system was further developed in the United States, which declared its independence from Great Britain in 1776. Like Britain before it, the United States was then technologically backward compared to the continental European nations, and American leaders were painfully aware of the need to develop an independent technological base if the new nation was to be able to keep its independence and to make its own way in the world. This is eloquently demonstrated by the fact that patent protection for inventors was written into the Constitution.

There has been considerable discussion about the actual workings of the patent system, with some who contend that patents should not confer exclusive rights on the inventor and others who argue that conferring monopoly rights will lead to a vast outpouring of good ideas, thereby shortening the useful lives of machines and proving uneconomical in the long run. But it is only when you are secure in the knowledge that your idea will be recognized as yours and yours alone, for a set period of years, that you can truly devote yourself to the creative process. History has shown that this system encourages the emergence of one new idea after another. It was thus the consensus in the recent WTO negotiations, that it is to

everyone's advantage to ensure that patents are observed worldwide and to protect the fruits of human intellectual endeavor. This is also why the WTO is structured so that countries that do not observe global patent rights are judged to be unqualified to take part in free trade.

## **New Drugs Save Lives**

The scope of intellectual property rights protection has gradually been expanded. For example, Japan instituted the necessary legal amendments to make pharmaceuticals patentable in 1975, and Japanese pharmaceutical companies started to make a determined research and development effort in 1976, after the system of patents for substances was established.

This was a mere two decades ago, and because the adoption of the patent system for drugs made it impossible to produce copycat products, the Japanese companies had no choice but to beef up their R&D. In the last 20 years, Japanese companies have improved their technical positions, such that they now rank third worldwide, behind only the United States and Great Britain. If good pharmaceuticals can be developed, it may be possible to cure formerly incurable illnesses. Stomach ulcers are a case in point, and the development of new pharmaceuticals has now made it possible to cure many patients who would once have required surgery.

In the 45 years from 1947 through 1992, the Japanese life span has grown 20 years. It is estimated that at least half of that is due to the availability of newly developed pharmaceuticals. Yet drug research is a high-cost, high-risk business. It may take 10 years and cost over 91 million dollars to develop a single new drug. It would be impossible for pharmaceutical companies to invest that kind of time and money in new product development if pharmaceuticals were not patent-protected and if there were no guarantee that the investment could be recouped on the market. The patent system is thus extremely important to the pharmaceutical industry.

## **Raising the Reward Level for Inventions**

Patents also encourage technological development within the company. Patents motivate employees and provide incentives for the people in research and development. Yet for this to work, it is essential that the company should properly reward its people for their inventions.

The tradition in Japan has been that patents on employees' inventions are automatically assigned to the company. In turn, companies have provided incentive rewards for people who came up with useful inventions and patented them.

But these rewards were generally nominal, and it often happened that the rewards for subsequent patent use also amounted to little. The company position has been that the research and development that led to the invention and the filing were all done as part of the person's job and that the basic payment was already covered by the person's salary. To provide substantial rewards for patents would, in effect, be paying someone twice for the work, which would not be fair to the employees who do not have access to such incentives.

This approach may work for technologies and inventions that simply represent improvements over the existing state of the art, and where work is often done in teams, but it is essential that companies be prepared to reward the individual researchers who come up with significant new technologies that contribute substantially to the company's bottom line. The time is past when just putting the researcher's name on the patent could be seen as adequate reward, and it is imperative that corporate patent incentives be beefed up, to motivate more research and to enhance the company's international competitiveness.

In electronics, medicine, chemicals, and virtually every other industry, the leading companies are moving to enhance their in-house patent systems. One of the main pillars of this effort is that they are greatly enhancing the incentives and rewards for people who produce profitable inventions that can be licensed to other companies. They are seeking to motivate their researchers more and to get patents that will be valued worldwide. Today, the world is increasingly moving away from the mere production of goods and toward the creation of intellectual properties that can be patented or otherwise protected and can then earn money on world markets. It is imperative that Japanese companies make a determined effort to enhance their incentive systems, both to reward their outstanding researchers and to prevent their intellectual resources from leaking away.

In essence, beefing up the incentive system means introducing result-based rewards for the R&D people. At the same time, the evaluation criteria are moving away from the traditional emphasis on the number of patents, to a new focus on their quality, and this is having the effect of revealing intellectual resources that had previously been buried within the company.

Sony, for example, has recently enhanced its incentive system for employees who make patentable advances and do other creative work, raising the maximum award level to just under 200,000 dollars. Under this system, Sony annually selects inventions that have contributed significantly to the company's position and awards the inventors over 18,000 dollars- which can be won for a maximum of 10 years. At Toshiba, the patent incentive awards have been raised ten-fold, to a maximum of 91,000 dollars. Because this is a system that provides for payments every year, as long as the invention is earning licensing fees for the company, it is possible for an inventor to earn as much as 909,000 dollars from it. At

Takeda Chemical Industries, a system was adopted in 1997 whereby a researcher who comes up with a saleable new pharmaceutical is eligible for sales-pegged awards of between 68,000 and 455,000 dollars, over a five-year period.

## Patents Protect Technology

The company that has its own proprietary technology is in an advantageous position, and it is important that inventions be patent-protected. Because it costs a lot of money for venture start-ups to build factories and to employ workers, one common strategy is to concentrate on selling their brain-power. In such cases it is essential that they use the patent system wisely, so that their hard-won inventions are not copied.

When an SME invents a new product or technology, big companies will often go to them, proposing joint development, offering to handle sales, or otherwise wanting a piece of the action. It is rumored that there have been cases in which an unwary SME revealed the patent details to the big company, which then outsourced production to one of its subsidiaries, leaving the SME that invented the product out in the cold. SMEs are increasingly aware of the need to protect their inventions and technologies with patents.

## Learning Technology from Patents

Patent information is becoming increasingly valuable, since it represents a treasure trove of technology. A recent study by the European Patent Office found that European SMEs waste 20 billion dollars every year duplicating research and development work that has already been done elsewhere, and that they could have accessed by simply checking the patent records. Such is the cost of failing to monitor patent information. It is definitely worth monitoring and mining patent information, both to avoid wasteful duplication and to access useful technology.

Although some people find patent information difficult to read at first, an SME needs to develop a wide range of innovative products if it wants to survive. Using patent information can vastly facilitate this process. Oddly enough, filing for a patent is an easy way to access the best technology the world has to offer because, if an inventor applies for a patent on something that has already been opened to the public or patented, the JPO will reject the application and send back a notification with information on the relevant prior patents. In effect, the patent examiner will tell the SME about the relevant technology, and the extent to which its own technology is innovative, or not.

The Japanese Patent Office currently employs 1,600 examiners. They have a vast database at their disposal, with 40 million patents in it. The first thing they

check is whether or not essentially the same invention has already been patented. Obviously, it cannot be patented twice and the application will have to be rejected if it is already patented. Looking at this information will enable the SME to judge how its invention compares. Sometimes this may lead to a decision to license that particular technology. Sometimes it may be that the two inventions only look alike but there are actually a number of significant differences that make the later one better.

In the past, applicants had to go to the JPO and go through the *Patent Gazette*s one by one, but this entire system has now been computerized and it is very easy to use the database to retrieve patent information.

### Using Patents to Track the Competition

It is also important to use patents to track the competition. If you know how far a company's patents have gone, you have a pretty good idea what the company is doing. In developing a new product, for example, a company usually starts by creating a prototype. Then it develops the production technology. It then makes the machinery and equipment, and then the parts. Only after all of this is done does it apply for the appropriate registrations. Patent applications follow the same set of steps. The development stage goes from the creation of the prototype to the development of the production process. So if a company starts filing for patents on the machinery and equipment, you know they are very close to making prototypes. Once they start making parts, mass production is not far behind. If you watch a company's patent filings, you should be able to get a pretty good idea what new products they are developing and how close they are to commercialization. If they just make a prototype and stop there, you can conclude that they will not be rolling the new product out anytime soon. Today, it is possible to monitor the competition's patent information with computer searches. The flip side of this, of course, is that other companies can monitor your activities just as easily, and so it pays to be careful.

## 4.3 International Strategy

With market globalization, patents are an increasingly important part of the company's international strategy as well. Under the WTO/TRIPs Agreement, the patent system has spread worldwide. It may be that strong relationships of trust mitigate the need to worry too much about people you deal with regularly in the domestic market, but international business is much more legalistic and you should be prepared for trouble. Indeed, patents are often your only protection in international business.

Because companies all over the world are trying to guard their profits and positions with patents, the more internationally active a company is, the more it will find other companies with patents and products that look like its own, and the more patent friction it will encounter. In fact, other Asian countries are rapidly becoming more technologically proficient, and there has been an outpouring of counterfeit products. This is a very dangerous situation. But if a company has the proper patents, it is easy to stop counterfeits from entering its home market. It is essential that all companies have watertight international patent strategies.

Both companies and their filing patterns are becoming more international. NEC has been making an effort in 1999 to get more U.S. patents than any other company, and they have effected a major increase in the number and quality of their patent filings. With the international community moving to strengthen patent protection, it is very likely that both licensing fees and damage awards in the event of infringement will go up, and NEC wants to be ready by expanding its patent assets. In 1998, NEC filed a total of 2,500 patent applications with the U.S. Patent and Trademark Office - an increase of 10% over the previous year. Of these 2,500 applications, 1,500-1,600 are expected to be granted by the end of 1999. If NEC can continue to improve the quality and number of its applications, it should be able to eclipse the two leaders (IBM and Canon) and take over the top spot for having the most patents granted in the U.S.

As part of this drive, NEC has sharply increased its budget for patent filing and has changed its system from having the head office handle all patent applications, to having the semiconductor, telecommunications, and other divisions handle their own patent applications. Giving these divisions the necessary budgetary authority and making them responsible for filing their own patent applications is expected to make everyone more aware of the importance of patents. It is estimated that it costs about 18,000 dollars per application in the U.S. NEC is already Japan's top domestic patent-winner, and it budgeted some 91 million dollars in fiscal 1998 for patent-related work alone.

Formulating a strong international strategy also changes the role of the intellectual property department. Following the war, Japanese corporate intellectual property departments largely concentrated on finding out what patents were available overseas, checking to see how strong the patent was, and then negotiating to license the technology. In effect, they were charged with administering and supervising the patent side of technology imports.

But Japanese companies have recently become technology licensors as well as licensees, and the intellectual property department has also been charged with filing for overseas patents, licensing the technology, and taking care of the contracts and other legal details involved. In addition, with the increasing number of products made overseas that infringe on Japanese patents, the intellectual prop-

erty department has also had to monitor markets and watch for infringements. This is all pivotal to the company's international patent strategy.

## 4.4 Legal Strategy

### Patent Disputes Demand Crisis Management

While they are seen in Japan as incentives for the inventor, patents are perceived in the United States as weapons in the war of business. And because increased patent friction is more likely as business relations become more global, it is important that every company has a legal strategy for patents.

There have been cases in which counterfeit products, in blatant violation of a company's patents, have cut into the company's sales so much that they have driven the company bankrupt. Conversely it has happened that companies have infringed on other companies' patents, have been taken to court, lost the case and been fined so heavily that their very survival was jeopardized. In the patent dispute between Polaroid and Eastman Kodak in the United States, the damages awarded were well over 909 million dollars - a substantial amount of money. In a case involving a Japanese camera company (Honeywell vs. Minolta), the latter was found guilty and ordered to pay 155 million dollars, ending up in the red for the year as a result. A game software company was also fined millions of dollars by a U.S. court for copyright piracy. These amounts are eloquent testimony to the fact that patent infringement can have very serious consequences. The intellectual property department therefore has to be an important part of the corporate management process. Indeed, there are a number of Japanese companies that are following the U.S. lead and combining their intellectual property and legal departments.

U.S. and Japanese companies treat their intellectual property departments differently. In the U.S., the intellectual property department is generally part of the legal department at the head office. As such, it is independent of the sales, research, production, and other departments. The head of the intellectual property department is responsible for advising management on legal issues and overseeing compliance, and the department's standing is at least equal to that of other departments within the company. Compliance is especially important, because infringing on another company's patents can put the entire company at risk. At the same time, monitoring patent information can contribute importantly to the company's bottom line. The American intellectual property department plays both offensive and defensive roles.

By contrast, in the average Japanese company, the intellectual property department is often seen as a purely defensive player in an effort to keep other

companies from obtaining key patents and hemming the company in. In Japan, the intellectual property department is typically part of the research department or the technical division, and is seen as being responsible for handling the paperwork for obtaining a patent when the research and development people have come up with something interesting. In the Japanese company, it is the legal department that is part of the administrative structure, and the legal and intellectual property departments are perceived as being in different streams. Traditionally, the pattern has been for legal issues relating to intellectual property rights to be handled by the technical and development departments.

In an American company, the intellectual property department will be headed by a patent attorney, and many of the people in the department will be licensed attorneys, such that the company has a strong staff, fully capable of handling intellectual property administration from the legal side. By contrast, the Japanese company usually separates the general-issues legal department and the intellectual property legal department. The company does not employ many lawyers in-house, and legal issues are usually handed over to an outside legal office. There is thus a major difference between the U.S. and Japanese company legal strategy. (*Table 4.3*)

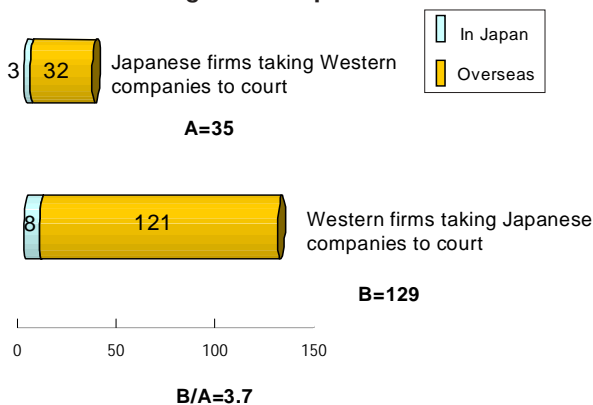
**Table 4.3 Comparison of Japanese and U.S. Corporate Intellectual Property Policies**

	Japan	United States
Basic approach	Defensive to keep technology out of competitors' hands	Aggressive to monopolize market
Intellectual property department's location	Mainly affiliated with research and development departments	Mainly affiliated with legal department
Intellectual property department orientation	To obtain intellectual property rights	Advises on corporate strategy
Use of patent attorneys and other attorneys	Use outside patent attorneys	Rely on in-house legal staff

*Source: Compiled by the Japanese Patent Office from Guide to U.S. Patent Litigation (Hideo Ozaki, Japan Machinery Exporters' Association, 1991), How Western Companies Manage their Patents (JETRO, 1993), and Issues in Japanese Corporate Handling of Intellectual Property Rights (Tomonori Anegawa, Japan Machinery Exporters' Association, 1993).*

Japanese companies have filed only 35 patent infringement cases against U.S. and European firms in recent years. By contrast, U.S. and European companies have filed 129 patent infringement cases - 3.7 times as many - against Japanese firms. While opinion is divided on whether the U.S. and European companies are engaging in legal harassment or whether the Japanese companies are failing to protect themselves, this much is clear: the U.S. and European firms are very aggressive about protecting their rights and the Japanese firms would rather settle things quietly. Yet whatever approach is adopted, the company that fails to formulate a firm legal patent strategy puts its survival at risk. (*Chart 4.4*)

**Chart 4.4 Patent Litigation Comparisons**



**Source:** *Corporate Intellectual Property Trends, JPO, March 1998*

Legal issues are also very important in technology development. This is illustrated by the effort to create *de-facto* standards, for example. With the digital era representing an amalgamation of technologies from many different fields, it will be impossible to establish industry-wide standards unless many different companies pool their proprietary technologies. How much these *de-facto* standards reflect a given company's technology depends, in large part, on the strength of that company's legal position.

Canon assigns about 400 people to its intellectual property department and earns over 91 million dollars a year from patent licensing fees. At the same time, this offensive strategy is balanced by a defensive strategy, mounted by a special committee established in 1987 and charged with keeping the company out of legal trouble. Indeed, it would not be possible for Canon to mount an aggressive global strategy were it not for this committee's work.

## Realistic Practice with Mock Trials

Many companies stage mock trials, so that they will be ready when trouble happens. Kao, for example, has held a number of in-house mock trials so that it would be prepared for patent litigation. The company picks a real-life theme, divides the in-house specialists into the prosecution and the defense, and they argue just as strenuously as though it were the real thing - with a jury of disinterested laymen giving verdicts. While such mock trials are a common practice at U.S. law firms, Kao is a very unusual Japanese company in holding in-house courts.

Kao's first mock trial was in February 1998 and was held at one of the company's Tokyo offices. The three lawyers for the plaintiff, the three lawyers for the defense, and the judge were all played by people from the Kao patent department. The four-person jury that decided whether or not the patent had been infringed were ordinary employees, not specialists. With eleven people to a team, these groups focused on actual cases from Japanese and foreign case law, spending a total of six hours arguing each case. These mock trials are seen as part and parcel of the intellectual property department's training curriculum, and people spend half a year getting ready for their "day in court." In addition to being engaged in fierce litigation over European patent procedures, Kao is also busy in the Japanese courts as well. Patents are a system for exposing your proprietary technology to assessment by the patent authorities and the courts, and these mock trials are intended to teach Kao's people how to emerge victorious from such encounters.

## 4.5 Developing Patent Prowess

It is important that the company has a coherent patent strategy and develops strength in patents. In fact, there are a number of corporate rankings now that classify companies by how well positioned they are to win disputes over intellectual property rights. Once a company develops a reputation for having the ability to win such disputes, competitors are less likely to risk infringing on the company's patents. Conversely, a company that is known as a patent push-over, runs the risk of having its patents violated. It is important that the company develop a reputation for patent strength.

### Assessing your Patents

Generally speaking, Japanese companies make a considerable effort to obtain patents but then do not pay very much attention to the patents, once they have them. Yet with the recent spate of patent disputes, infringements, and other prob-

lems, an increasing number of companies have started looking again at how they are using patents and what infringements might be under way.

The major Japanese automakers, for example, have all started work on ascertaining that other companies' technology does not infringe on their patents. With U.S. and European automobile companies becoming increasingly assertive about their patent rights, this is an effort by the Japanese auto firms to redefine how far their patents extend and to make it easier to fend off infringements. At the same time, it is an effort to highlight questionable areas and practices, to calculate appropriate licensing fees, and to pay and be paid these fees. Even so, the automakers lag behind the electrical machinery industry and other industries in their patent awareness.

Toyota, Japan's largest automaker, recently reached a patent-confirmation agreement with Mazda and Mitsubishi Motors and has started cross-checking technologies and patents with Nissan. When Honda turned up a number of specific areas where other companies were suspected of infringing on its patents, they entered into negotiations, to settle out of court. Of course, the companies are also discussing methodologies for checking technologies and patents.

There are very few cases of patent disputes among the leaders in the automobile industry internationally, and patents are mainly seen as defensive instruments in Japan and elsewhere. Yet as companies and societies become more environmentally aware and safety-conscious, new technologies will be developed for electric automobiles, hybrid engines and the like, and all of the major automakers are currently hard at work readying their next-generation product lines. U.S. and European companies in particular are beefing up their patent strategies and mounting a two-pronged offensive, based on aggressive sales and proprietary technology. Faced with this challenge, the executives responsible for intellectual property rights in Japanese companies are agreed on the need to restructure their patent strategies and to be more aware, on a daily basis, of what patents they do or do not own. Once they have figured out their own patent positions, they will then be ready to think about cross-licensing and other elements in their patent strategies.

## **In-House Patent White Papers**

Until recently, Japanese companies have been largely content to obtain patents and forget them. But some companies have started doing comprehensive in-house studies to see how they are using their patents. The next step is for these companies to publish their own "Patent White Papers" detailing their four patent strategies (management, technological, international, and legal) and providing an overall assessment of the company's strengths and weaknesses.

The first thing that the Patent White Paper has to consider is the amount of money that the company spends on patents, whether or not it has any licensing income, and whether patents make a positive or a negative contribution to the company's bottom line. The money spent on patents includes both the fees paid to the JPO, to obtain and maintain a patent, and the money paid to license other companies' patents.

The second thing that the Patent White Paper should cover is whether or not patents contribute to strengthening the company's technological competitiveness. How does the company go about documenting the technologies that come out of its research work and filing patent applications on them, including requests for examination? What is the ratio between applications filed and patents granted? How many patents does the company currently hold? Do these patents make the company stronger technologically? Does the company have key patents or only peripheral patents? How does the company measure up in patent terms against its Japanese and international competition? Does the company provide adequate incentives for in-house inventors? Does this include recognition? Promotion? Money? Anything else? It is important to check and make sure that the incentive level is appropriate.

The third thing that should be in the Patent White Paper is international benchmarking. All companies are inevitably becoming more active on the international stage. As the company's business becomes more global in nature, is it obtaining patents overseas, as well as in Japan? Is it sure its patents are not being violated in other markets?

And the fourth thing is to look at the company's relations with other companies. In the patent field, what oppositions has the company lodged with other companies? What oppositions have other companies lodged against the company? Companies routinely remind each other to stay away from patented technology. Is this being done? Is there any patent litigation pending? It is crucial that these legal issues be reviewed and re-thought.

When all of this analysis is done, it is then necessary to assess the place of intellectual property within the company, to compare this to the situation in other companies, to identify potential problems, and to get management to address the issues and to come up with solutions.

## **Human Resources Development**

Human resources development is an essential element, as the company moves ahead in formulating and implementing its patent strategy, and it is important that the company is innovative in its training programs.

As patent issues have become increasingly important in the workplace, Fujitsu, for example, has produced an educational CD-ROM utilizing a popular animated cartoon character, to make sure that its people are fully aware of the many issues involved in copyrights, patents, and other intellectual property rights. This CD-ROM has already been distributed to 58,000 people at Fujitsu companies and affiliates, and many people have commented favorably on how easy it is to view and to understand. Titled *Intellectual Property Guidelines*, the presentation starts out with a general explanation of the history and objectives of intellectual property rights and then goes on to discuss specific examples of infringement, and what should be done in each case. It even includes a discussion of the legal issues involved in photocopying newspaper and magazine articles, and a quiz format on what does and does not constitute infringement. These guidelines used to be available on paper, but there were many parts that were difficult to understand, so Fujitsu got the permission of the original authors, the publishers and all of the other parties necessary, and then adapted it for a CD-ROM presentation, which is expected to be a more effective educational tool. Whatever you do, it is essential that all employees are fully aware of intellectual property rights issues and that the company is able to formulate and implement a consistent patent strategy.

## From Numbers to Quality

Japanese companies and inventors file about 380,000 patent applications a year. This is twice the equivalent figure for American companies and five times that for European companies. Because Japan operates under a first-to-file system, it is essential that companies file quickly, since this will put them in a position to block conflicting claims that might be filed later. In fact, many of these filings are defensive in nature and intended to keep other companies from getting particular patents. The over-competitive nature of Japanese companies also shows up in their patent applications. Many are determined to file at least as many patent applications as the competition. Yet times are changing, and companies should shift their focus away from sheer numbers - filing patents on every conceivable item of related technology - and should start to concentrate on patenting the core technologies.

The JPO is trying to encourage this shift to quality, by releasing data on the ratios of applications filed to patents granted. Complementing this, companies are starting to pay more attention to the costs involved and to the return on their patent investment, with the result that the rate of patents granted is going up. In 1997, the average ratio of patents granted to applications filed was 70.2% for the 20 companies filing the most applications. The company with the best record was Yamaha Motor, which filed a great number of engine-related patent applications

and had a success rate of 96.3%. Yamaha was closely followed by Hitachi Construction Machinery, Chisso, Kawasaki Heavy Industries, and Mitsubishi Rayon. Japan is clearly moving from an era in which companies sought to overwhelm the competition with the number of patent applications filed, to a new era in which companies will try to patent core technologies and make the most effective use of their patent portfolios.

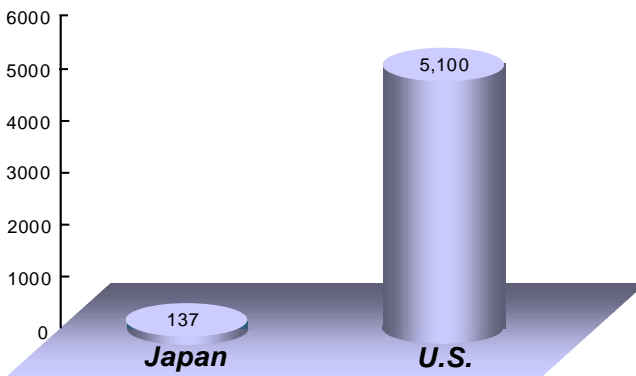


# 5

## University Research as a Hotbed of Basic Technology Patents

After World War II, Japan gained access to large numbers of U.S. and European basic technology patents, and then improved on these technologies to power its economic growth. In recent years however, U.S. and European patent-holders have become more cautious about licensing their technology to Japanese companies, and it has become more difficult to access these core technologies. Looking ahead, it will be essential that Japanese companies own their own patents in the 21<sup>st</sup> century and it is expected that many of these core technologies will come out of university research laboratories. However, Japanese universities are not very patent-minded. (*Chart 5.1*)

**Chart 5.1 University Patent Application Filings (1995)**



Source: Patent disclosures for Japan, patent applications for the U.S.

Note: Japanese data from JPO, U.S. data from AUTM Licensing Survey, 1991-95.

## Patents as Links for University-Industry Cooperation

It is very important that university researchers develop a wide range of technologies and that they are made available for the betterment of society. Likewise, it is essential that the results of work done in university research laboratories - the mainstay of basic research - be protected by patents. Yet it is often said that Japanese inventors do not hold any core technology patents. Who is in the best position to come up with these core technologies and patent them? It is the university researchers doing basic research. All of Japan will benefit if the universities do good research and are conscientious about patenting the results. Given that the 21<sup>st</sup> century is expected to be a time of nation-building, based upon new technologies, it is hoped that the universities will be vigorous in the pursuit of truth and will then obtain patents, to make their findings available to the rest of society.

### 5.1 Industry is Academia's *Dojo*

Kotaro Honda, often called the "god of steel" in Japan, was selected as one of Japan's top ten inventors of all time and served as president of Tohoku University. It is to Honda that the phrase "industry is academia's *dojo*" (exercise hall) is credited. Academic studies are tempered in the forge of real-life industry; such tempering gives them true added-value.

#### Support for Universities

What needs to be done if universities are to be able to obtain patents on core technologies? When asked this question, university professors say that the current arrangements make it very difficult for them to patent their work. If anything, the system is tilted against patents. For one thing, the universities give papers a higher priority than they do patents. Publishing is the important thing, and patenting work does not count. For another, the need to document the work in detail and to draw up complex patent applications is a major burden on university professors. Thirdly, the patent screening committees within the universities are very officious, and it takes a long time and much hard work to get an application past them. And the fourth reason the system is anti-patent is that they do not have the money needed to file applications and maintain patents.

It is thus imperative that Japan should put a support structure in place to resolve these problems and to enable the Japanese universities to carry out research and obtain patents in the same way that they now do research and write papers, so that the fruits of their research can benefit all of society, as happens in

the United States. There are two stages to this. The first is that university performance evaluation criteria must be changed so that patents can be recognized as an important factor in the person's favor. The second is that liaison functions need to be strengthened so that patents can serve as bridges to link academia and industry.

The Law Promoting Technology Transfer from Universities to Industry was enacted with an emphasis on patents. Under this law, the Japanese government agreed to provide up to about 909,000 dollars in support funding and to provide loan guarantees for the establishment of technology licensing offices. These technology licensing offices are intended to ferret out and assess technology with commercial potential, to help with the patent applications, to entrust the exploitation of the patents to start-up ventures, and to distribute the licensing fees to the universities and researchers where the technology originated.

An Office of Research and Educational Policy Planning was also established in the JPO to provide lecturers and counselors to universities and other research facilities, to provide patent information, to facilitate the establishment of patent courses in university curricula, and otherwise to support university efforts. With the passage of the Law Promoting Technology Transfer from Universities to Industry, the University of Tokyo, Tohoku University, the Tokyo Institute of Technology, Kyushu University, and other leading schools have established Technology Licensing Offices (TLOs), and it is hoped that the law will have the desired effect.

Japan also needs to review its provisions for assigning patent rights and facilitating their use. It is important that this system be such as to provide incentives for researchers, and ways should also be found to encourage joint research by academia and private industry.

## 5.2 Patent Science

Patent science is a very interdisciplinary field. Because patents are a crystallization of technological information, patent science obviously includes science and technology. Yet the economic impact of patents means that this science must also include economic analysis, while their significance in corporate strategy means that it needs a business-school approach. Other facts will involve other disciplines and all of this is in addition to the legal research which is consequent upon the fact that patents confer exclusive rights. Indeed, it will be impossible to tell what kinds of patents are to the company's advantage, what patents contribute to scientific progress, what the Anti-Monopoly Law and other legal ramifications are, or how to answer the many other issues that arise unless patent science is seen as an interdisciplinary subject.

In the United States, many of the best legal minds have studied science as undergraduates and then gone on to law school. Thus, these American lawyers are comfortable dealing with technical issues. Intellectual property rights is a popular field of study in U.S. law schools. In Japan, by contrast, most of the lawyers have come from the ranks of the liberal arts. So when a patent dispute arises between Japanese and U.S. companies, the American lawyers wade right into the technology. By contrast, the Japanese legal staff is okay with copyrights and trademarks but has great difficulty with the technology - even though patent disputes generally center around technological issues. It is difficult to see how Japanese lawyers will be able to hold their own in patent disputes unless they can come to grips with the science involved.

In Japan, when people talk about patent studies, they usually mean the study and analysis of patent disputes, and this is usually done by the legal people. But looking ahead, Japan will have to create teams of people with scientific and liberal arts backgrounds and will have to develop a broad awareness of patent science.

For example, the University of Tokyo's Research Center for Advanced Science and Technology (RCAST) was established, from the very first, with the idea that the science people and the liberal arts people should work together, to learn from and to stimulate each other. Recently, the Center has established a Department for Intellectual Property, again with participation from both the sciences and the arts, and has started working on devising a total approach to intellectual property issues that will involve both scientific and liberal arts expertise.

Ritsumeikan University is another example. There, they are experimenting with creating an entirely new kind of university and have coined the phrase "scientific arts". As part of this effort, Ritsumeikan has moved this faculty from Kyoto to the Biwako Kusatu campus, and people from the College of Science and Engineering are working together with faculty members from the College of Business Administration to research intellectual property issues. I have had the pleasure of being invited to lecture there twice, and found that the school, being an extension center, is working to benefit local industry by opening its research, not only to faculty and students, undergraduate and graduate alike, but also to people from local industry.

# 6

## A Global Patent Scenario

### 6.1 Hopes for Global Patents

Business is becoming increasingly global. Companies are developing products with world markets in mind, and often they are rolling these products out globally. Thus it is only right that patent protection should also be global.

The prototype for today's international patent protection system was created in Paris in 1883. While industrial nations continue to grant national patents under national law, the Paris Convention provides for mutual recognition on the priority of filing date and a number of other key issues. Thus, even though a Japanese patent is technically only valid in Japan, the broad practice of international disclosure means that it can establish precedent and prevent people from obtaining patents on the same invention elsewhere. Inventions require global novelty to be patentable. Something that is already known in the United States cannot be patented in Japan. Nor can something that is already known in Japan be patented in Europe. Another feature of the patent system is that of national treatment, which means that each applicant is treated the same, regardless of nationality. This is a very forward-looking system.

This system was very well suited to the great age of industrialization in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, following the industrial revolution. But as business has become increasingly global, more and more people have begun asking if there might not be an easier way to handle patents globally. Might it not be possible, for example, for a patent granted by the Japanese Patent Office in response to an application filed in Japan to be recognized internationally as well? And this is not just a Japanese desire. U.S. and European multinational corporations are also very interested in the idea of global patents.

## 6.2 A Four-Stage Approach

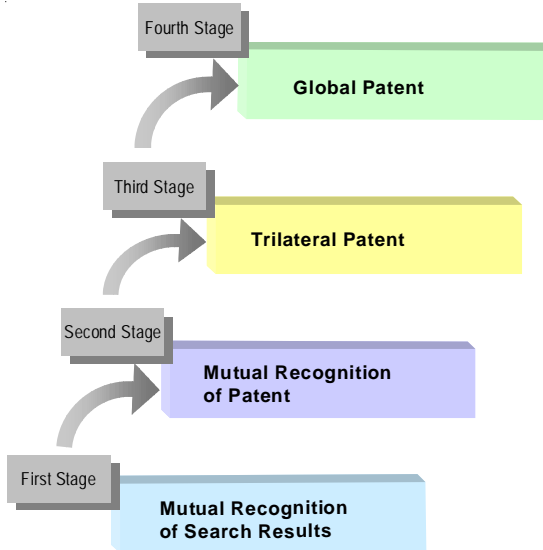
The JPO, USPTO, and EPO have been meeting annually since 1983 to discuss such initiatives as data exchanges, shared computer search capabilities, and exchange programs for patent examiners. At the meeting held in The Hague in 1996, Japan proposed that they also study the idea of a global patent, in line with the multinationalization of business, and this idea was well received by both the United States and Europe. It is hoped that Japan's success with computerizing its patent system can be extended worldwide as part of the effort to create a global patent. This will be basically a four-stage effort.

The first stage is to get agreement on the sharing and mutual recognition of prior-art search results. There is, for example, an application pending in the U.S. for a patent on a DNA sequence. This is a single patent, but it is expected that it will cost the patent office about 9,100 dollars to ascertain whether or not the same basic application has already been filed, or the information is already commonly known. It would be very wasteful to have to duplicate this effort in Japan and Europe. If one patent office has conducted a prior-art search, it would make sense for the other jurisdictions to recognize those search results. An ordinary filing in Japan currently costs 191 dollars, and it is impossible for the JPO to hope to break even if it has to spend about 9,100 dollars just for ascertaining patentability. Likewise, business would prefer not to spend the time and money filing the same application in three different regions. At this first stage, fostering confidence of search results would be undertaken first through concurrent search and exchange of examiners.

The second stage is to recognize each other's patents. A patent that has been granted in Japan, for example, should be recognized in the United States, and vice-versa. In a way, this is very similar to the way automobiles or electrical appliances that meet one country's standards are accepted for use in the other country as well. With this in mind, more and more people are starting to suggest that patents should be mutually recognized in the same way as industrial and technical standards.

The third stage is to implement trilateral patents between the U.S., Europe, and Japan. And the fourth stage is to extend this worldwide, to provide a truly global patent system. (*Chart 6.1*)

This is the basic road map on the way to global patents. There are, of course, many problems that have to be overcome - including negotiating new treaties, amending national laws, harmonizing examination standards, fostering mutual confidence of search results, creating interconnected computer systems, and providing more international training for examiners - and it will by no means be easy to achieve this global patent system. Yet science and technology know no national borders. The time is right for global patents that will be respected worldwide.

**Chart 6.1 Road Map to a Global Patent System**

### 6.3 Trilateral Cooperation between Japan, the U.S., and Europe

With the increasing need for a global patent system, and given that necessity is the mother of invention, it is essential that we make an effort to invent such a system. Thus the JPO, USPTO, and EPO have been talking together and, in November 1997, agreed on the Kyoto Action Plan. This includes the three mainstays of a trilateral network, trilateral concurrent search and examination, and a trilateral Website to promote trilateral cooperation.

The trilateral network involved setting up a computer network to link the Japanese, U.S., and European patent offices. This entailed considerable technical coordination, and it was not an easy job. But it was completed by November 1998 and is currently undergoing testing, prior to full-scale operation. If all goes as planned, this should have a significant impact on patent administration in the three regions. For example, companies still have to submit priority documentation to each of the different patent offices. Networking should eliminate this need.

Trilateral concurrent search and examination means cooperating on patent application searches. When a patent application is filed it normally triggers a search, to see what the prior art is, and then an examination, to see if the patent claim

involves significantly new technology. Today, each of the patent offices often ends up duplicating the work of the others when it gets an application. Thus, it is hoped that cooperation can enhance the efficiency of the process and make it possible for people to obtain patents faster and cheaper. This will also contribute to enhancing mutual confidence in search results, and in the quality of patents granted.

The trilateral Website means that each of the patent offices would put its information up on the Worldwide Web and that these Websites would be linked. This system is currently working.

The whole point of the patent system is (1) to grant inventors exclusive rights to use their inventions and (2) to make that information available to the general public. With the advances in computer technology, it is now possible to make the information available worldwide over the Internet. This means that it is no longer necessary to go to the patent office, just to find out about a patent. And because this is digital information, it can be searched quickly and easily. This is therefore a bold initiative by the JPO, USPTO, and EPO, to cooperate in making patent information available worldwide on the Internet. (*Chart 6.2*)

## 6.4 WIPO Efforts

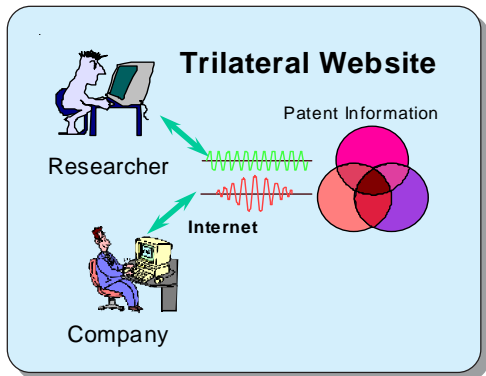
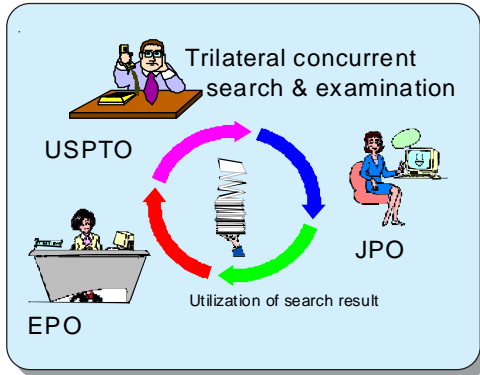
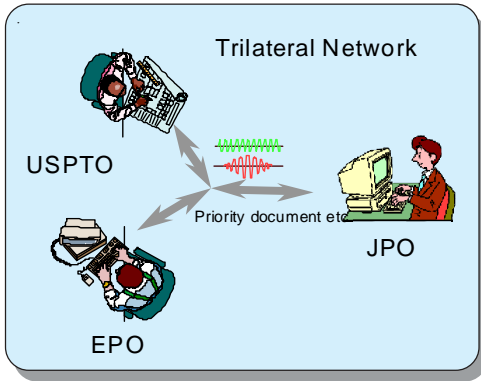
Achieving a global patent system will require an approach quite different from the traditional treaty negotiations. The WIPO has 171 member states, and it would be very unwieldy to try to negotiate a new treaty with all of them.

Thus, a *de-facto* approach has been suggested, whereby the three core patent offices first create a *de-facto* global patent. The creation of a global patent does not have to mean the creation of a World Patent Office in Geneva with tens of thousands of examiners and other employees. There is no reason why the work cannot be de-centralized and handled locally. As WIPO Director General Dr. Kamil Idris has pointed out, it will be impossible to respond to global expectations if these negotiations take too long.

## 6.5 Madrid Protocol

The desire to sell the same products under the same brand names everywhere in the world demands that trademarks also be protected globally. While trademarks are registered country by country, the Madrid Protocol has been agreed upon in an effort to simplify this process as much as possible. At first, Japan opted not to accede to the Madrid Protocol, for internal reasons, but a Trademark Subcommittee was established, consistent with the recommendations of the Indus-

Chart 6.2. Trilateral Cooperation



trial Property Council in June 1998 and Japan ratified the Madrid Protocol in 1999. This will make it much easier for Japanese companies to gain protection for their trademarks overseas.

## **6.6 E-Commerce and the Increasing Importance of Intellectual Property Rights**

In July 1997, President Clinton called upon the entire world to do more to promote electronic commerce. The spread of the Internet has sparked a retail revolution worldwide. While it is preferable that the private sector take the lead in promoting e-commerce, governments have a role to play in the protection of intellectual property rights and other aspects. All countries should agree on protection for the software, hardware, telecommunications technology, and other computer technology needed to develop the Global Information Infrastructure (GII). As a start, this issue should be on the agenda for the trilateral conference. At the same time, international agreement should be reached as quickly as possible on resolving disputes involving trademarks and Internet domain names.

With proposals from Japan, Europe, and other interested parties regarding e-commerce, the European Ministers met in July 1997 to consider this. It is clear that e-commerce will spread, and it is imperative that an international cooperative system be established to provide the necessary protection for intellectual property rights.

## **6.7 Promoting Cooperation with Developing Countries**

With the establishment of the WTO/TRIPs Agreement, the intellectual property rights system is spreading worldwide. Seeking to cooperate in training the people who will be needed for patent administration in Asia, Japan initiated a program in 1996 to provide training for a total of 1,000 people over a five-year period. This has been very well received, and patent office employees, lawyers, corporate patent management personnel, university professors, and even prosecutors have come to Japan for training under this program.

Recognizing that the time will soon come when patents, trademarks, and more are computerized, and hoping to make Japanese computer technology available to other countries, Japan is also cooperating in these countries' efforts to computerize their national operations. Under the Intellectual Property Information Mall initiative, study is being given to computer-networking patent offices throughout the

Asia-Pacific area, so that everyone can see what is happening at other patent offices, can track an application's progress, and can have access to a wealth of other information.

Examination cooperation is also an important part of this effort. There are, for example, more and more instances of Japanese companies filing patent applications in Japan and filing the same applications in other Asian countries. As such, it would make sense for the Japanese Patent Office to tell other patent offices if the application was approved or rejected. This could save the other patent offices considerable time and trouble, especially since it very seldom happens that an application approved in one jurisdiction is rejected in another. Indeed, the philosophy of providing the appropriate protection assumes that an application that is accepted in one country will also be recognized in another, and this is another area of cooperation that should be promoted.

## 6.8 Combating Counterfeiting

The next area where cooperation is needed is that of preventing counterfeiting. More and more Japanese companies are running into problems with counterfeit products. Fully 80% of the imitations of Japanese products are made in Asia. While it would be bad enough if these imitation products were only sold in the markets where they are made, they are also exported to Japan, the United States, and Europe, where they seriously erode not only the Japanese companies' profits but also their reputations. People buy them, thinking that they are Japanese, and then blame the Japanese companies when they find they are of poor quality. There have even been cases in which people have unwittingly taken counterfeited medicines and become more ill as a result, cases in which people tried to recharge a rechargeable battery and were killed when it exploded, and others involving serious injury or loss of life.

This is a very serious issue, and the Japanese Patent Office is calling upon other countries' patent offices to do more to monitor infringements of intellectual property rights and to clamp down on counterfeiting. These are issues that should concern everybody in an industry, and individual companies are rarely able to deal with the problem alone. It is essential that both companies and national authorities cooperate to deal with this common threat.



# 7

## The Patent Information Highway

Patents are tight packets of information. It used to be that people had to access such information on paper, but the rapid advances in computer technology have made it possible to access the wealth of patent information in computerized databases. Making full use of computers, the JPO has become the world's first paperless patent office. This trend will be further advanced and a patent information highway built in the years ahead. The patent information highway will have two major parts: a cyber patent office and an intellectual property digital library.

### 7.1 The Cyber Patent Office

The idea of the cyber patent office is that it would be entirely paperless. For example, a person who invented something would not go to the post office to send in his or her patent application but would send it to the patent office on-line. Japan is the furthest ahead in this, and it has been possible to submit patent filings from dedicated terminals since December 1990, and from personal computers since April 1998. Once in the patent office, the application is not shuffled around on paper but is swiftly routed by computer for search and examination. And the applicant is then notified of the final decision by computer.

Companies are also going digital, and much of Japan's patent information is now in digital form. As the patent office goes increasingly digital, it will be possible for companies to download patent information onto their own internal networks, and thus make more effective in-house use of it. It has been well said that there is a wealth of information in patents. Using computers, it is now possible to mine this information easily, without going to the National Center for Industrial Property Information at the JPO. What is more, networks are being developed that integrate the company's own patent information and outside patent information.

Mitsubishi Heavy Industries, for example, has created the Mitsubishi Patent Administration System (MIPAS) to manage patent information, and the system has been in use since October 1998. Although the company's civilian-sector patent trade balance is in the red, the company is stepping up its applications for overseas patents on motors, machinery and other products, and seeking to bring its income and outlays into balance in the medium to long term. MIPAS is expected to provide effective support for overseas patent applications, and the company is accelerating its patent strategy. The MIPAS network links the head office, branch offices, and contractor patent attorney offices, allowing everyone on the system to search the entire database for patents that have already been granted. It also facilitates the paperless submission of patent applications. Because the inventor needs his or her supervisor's authorization to file for a patent, the system includes an electronic sign-off sheet, that can be handled purely on-line.

Starting in April 1998, it has been possible for people to file patent applications with the Japanese patent office by personal computer using Integrated Service Digital Network (ISDN) lines. Until then, submitting a patent application on-line required a special terminal, but it is now possible from virtually any computer, using the special software that is available from the JPO free of charge. Because it is now possible to file patent applications on-line, it is possible to handle all of the "paperwork" for applications and the like from intranets such as Mitsubishi Heavy Industries' MIPAS. This work can also be done by computer from outside patent attorneys' offices. The wave of the future is for companies to computerize their own patent work, in line with the JPO's computerization, and then to link the two computer systems so that they can search patent information, file patent applications, and do the rest of their patent business on-line. Along with this, a study has been started on how the Internet will impact patent filing as it develops still further. This governmental e-business model is being watched by all the world.

## 7.2 Electronic Patents (e-patents)

Thinking ahead, will the present paper-based system of detailed patent specifications which explain the patent concept, the design, or the trademark really be appropriate for the 21<sup>st</sup> century? It is very difficult to document computer graphics images on paper, and it would be much easier, faster, and more understandable to use digital media for this. It is clear that we should not cling to the detailed documentation format forever but should make an effort to adopt a new system that is better suited to the new millennium.

## 7.3 Intellectual Property Digital Library

The JPO database currently has information on about 40 million patents. If all of the information on all of these patents could be put on the Internet, so that anyone could search it free of charge, that would truly be a digital patent library - the largest database of patent information in the world. And if this could then be made accessible worldwide, with improved user interfaces, it would revolutionize the way patents are handled and used.

Amazing progress has been made in computerizing the Patent Office's work. From 1998, for example, the JPO made the complete text of its appeal decisions for invalidation instantly available on the Internet. They next put the information on patents which had been granted - as well as the disclosure information released 18 months after application - on the Internet for public access. They also made it possible for an inventor to computer-file a patent application.

Since March 1999, it became possible to search the patents, utility models, trademarks, and other information held by the JPO on the Internet using the free Intellectual Property Digital Library system. The available information includes all of the patents, designs, trademarks, and other information issued by the JPO from the Meiji era (late 19<sup>th</sup> and early 20<sup>th</sup> centuries) to the present - a massive 40 million documents. This is the largest set of documents in the world, and is far in excess of anything made available in the United States or Europe.

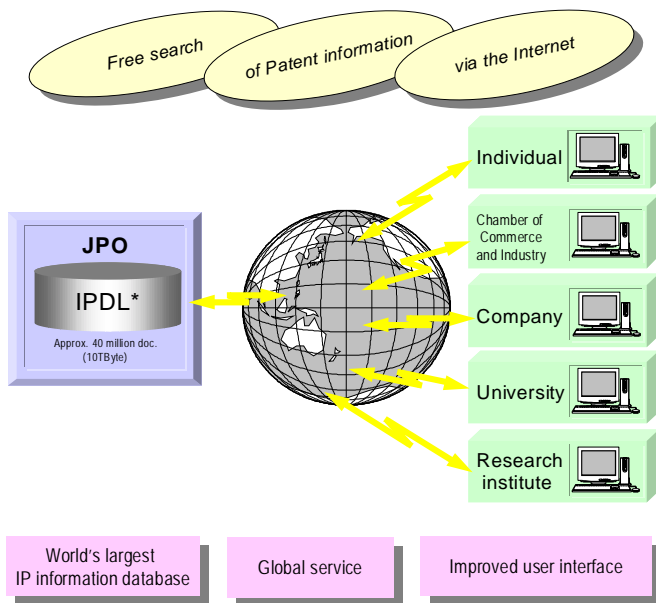
Under the old system, you had to go to the Patent Office in person. Now you can search the applications and access the latest advances in science and technology by computer from the comfort of your own home. This enables universities, venture start-ups, and other researchers on tight financial and personnel budgets to avoid duplicating research or getting embroiled in patent disputes, and will make it much easier for these institutions to track technology trends effectively.

The JPO is also working to make its own operations paperless, and everything from application acceptance to examination, approval, and notification can now be done on-line. This is the most advanced system of computerized patent administration in the world. The WIPO and the European patent authorities are looking to the Japanese system as a model of on-line patent administration, and the reforms at the JPO are on the technological cutting edge - a welcome exception to the general criticism that Japanese government offices are grossly inefficient.

The Intellectual Property Digital Library is also expected to change the way that corporations, universities, and other research institutions do their patent work, and it will make a major contribution to the development of science and technology in Japan. (*Chart 7.1*)

These advances in computerization, however, raise a number of legal issues that will have to be resolved. One is the question of the status of information on

**Chart 7.1 Intellectual Property Digital Library**



**Note:** The Intellectual Property Digital Library allows to access all open gazettes held by the JPO. It can be accessed from <http://www.jpo-miti.go.jp>

the Internet. Does it fall under the “prior art” category - things everyone knows? Traditionally, information has been transmitted in books, magazines, and other paper media, and publication was a prime criterion in deciding whether or not something was publicly known. Does publication on the Internet have the same weight and make the information equally publicly known? While the JPO does publish a *Patent Gazette*, would publishing the information on the Internet serve the same purposes and have the same impact in making the information publicly known? What is the nature of Internet publication?

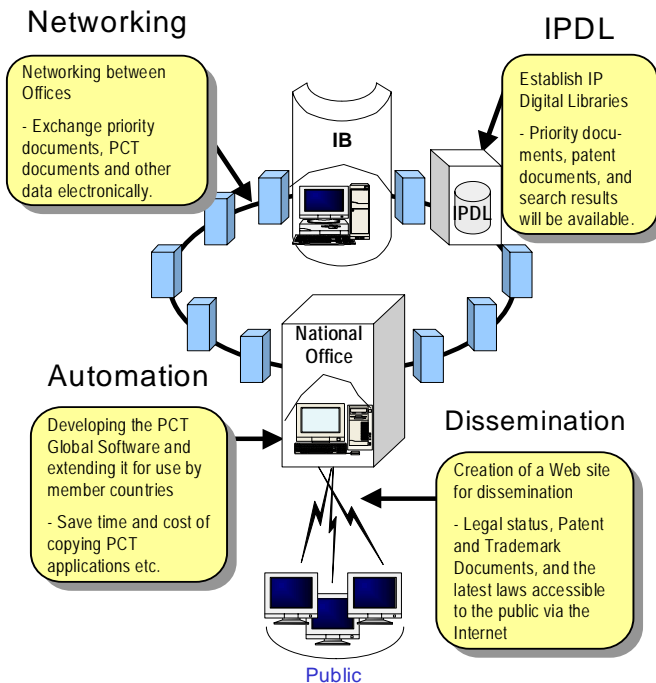
Another question is whether or not Internet publication and the like can be admitted as evidence in court cases. These are all important issues, but the Internet is not waiting for the legal issues to be settled. Internet use is spreading, and it will be up to the law to catch up. Indeed, Japan has recently amended its Patent Law to regard information published on a Website as publicly known, and this amendment will be effective as of January 1, 2000.

## 7.4 Intellectual Property Cyberplan

Japan is furthest along in using computers for patent work. Based upon the results achieved with electronic filing and with the Intellectual Property Digital Library, Japan has proposed linking all of the world's patent offices by computer, creating a network that would make patent information available to everyone, everywhere in the world. This it has called the Intellectual Property Cyberplan.

The idea of the Intellectual Property Cyberplan has been generally well received by the international patent community, and the Standing Committee on Information Technology (SCIT) has been established within the WIPO to study the idea. Under the Intellectual Property Cyberplan, the patent offices in all 171 of the WIPO member states would be computer-linked in a vast patent network. Once that is done, the next step would be to facilitate the network's use. Under the present rules, if a Japanese company receives a patent from the Japanese Patent Office and then submits the same application to a foreign patent office within one

**Chart 7.2 IP Cyberplan**



year, the date of filing with the Japanese patent office is accepted as the date of filing with the foreign patent office. But as more and more companies are also filing overseas, the paperwork is piling up and threatening to overwhelm everyone. If all of this can be done on-line, it will be unnecessary to send all of this documentation through the mails and considerable savings can be achieved. (*Chart 7.2*)

All patent offices check to see if an application represents a novel invention. This means that all patent offices have to have patent disclosure information, technical journals, specialist reference books and more, from all over the world. Many developing countries find it very difficult to assemble and stock the references they need. If all of this could be put on-line, such countries could simply access the industrialized countries' databases. Companies also have to go through the literature and check all of the patent information to make sure that the same invention has not already been patented elsewhere before they file a patent application. If all of the world's patent offices would put their patent information up on their Websites, it would vastly simplify such searches because everything could be done on-line. In addition, it would be to the patent offices' benefit, since they could switch from paper to computer processing.

Computerization would also have many other advantages. Thus it is hoped that this Intellectual Property Cyberplan will be implemented early in the 21<sup>st</sup> century, and it is expected that the plan's implementation will make an important contribution to scientific and technological progress.



# 8

## Broader and Stronger Protection for Intellectual Property Rights

### 8.1 Broad Protection for Intellectual Property Rights

The first imperative is to provide broad protection for intellectual property rights. Traditionally, patents have been primarily for manufactured goods, but with the knowledge-intensification of industry and technology, such things as bank trading routines can also be patented. Securities and insurance products, e-commerce modalities, hospital services and more can also be patented. Patents are becoming increasingly important, not only in manufacturing but in the service sector as well.

In fact, patent protection is broadening. In the past, it used to be available only for manufacturing processes and manufactured goods. In Japan, this coverage was broadened in 1975 to include pharmaceuticals and materials. Since then, micro-organisms, recombinant DNA technology, and even animals have been patented. There has even been discussion on the possibility of patenting cloned sheep.

In 1993, a mathematical solution for computers was patented. E-money, software, and the like have traditionally fallen under copyright protection, but since it is possible to avoid copyright infringement by changing the mode of expression, it has been argued that copyrights are inadequate for protecting such inventions, and that some way should be found to protect the idea, and not just the manifestation. Since 1997, it has become possible to patent software on a floppy disc or CD-ROM. In fact, the software is also patentable, and there has since been talk of extending patent protection to software on a network or other software that is not on a floppy or CD-ROM.

Looking ahead, this tendency to broaden the scope of patent protection is likely to continue. Until very recently Japan was still in the catch-up phase, and it

was possible to have a pretty good idea what the final product would look like when basic technologies were licensed from the United States and Europe and then commercialized. There was little risk, and this was an era in which improvement inventions flourished. Yet other countries have become more reluctant to sell or license their basic technologies, and the Japanese need to do more creative research and development - complete with all of the risks that are entailed and with the need for patent protection for basic technologies.

## 8.2 Intellectual Property Rights Protection for the Service Sector

The first thing that should be done is to have service companies manage their intellectual property rights better, preparatory to broadening the concept of intellectual property rights to cover the service sector. For example, looking at e-money, patents have already been obtained in the United States, Europe, and Australia. The only place e-money has not been patented is Japan, which means that Japanese banks and other companies wanting to use e-money have no choice but to use foreign patents in their international operations.

The second thing to be done is to construct a scheme for protecting new areas. While software has traditionally been protected under copyright laws, this protection is now increasingly seen as inadequate, and there are calls for patenting software. The same thing is true of databases and Internet domain names. In addition, the question of how these things relate to registered trademarks has come up. There are companies which have spent decades building up a brand name, only to find that someone else has registered a domain name incorporating their brand name.

The third thing to be done is to broaden the scope of patent rights. So far, improvement inventions have been granted narrow patents and almost everybody was able to get one. Yet basic inventions demand broader patents. In the past, the scope of patent coverage for Japanese patents was very narrowly defined, in strict accordance with the working example that was submitted, but the JPO is gradually changing its policies to grant broader patents in conformity with Western practice, and no longer to require a working model.

## 8.3 Patent Protection Potency: Does Infringement Pay?

Sad to say, the situation in Japan has been that patent infringement pays and it is the person whose patent is infringed who loses out. In Japan, awards in patent

infringement cases are only 1/200<sup>th</sup> of what they are in the United States. In many cases, even if a company discovers that its patents are being infringed and takes the infringer to court, the courts simply order the culprit to pay the usual licensing fee. By contrast, if you are caught cheating on your train fare, you have to pay triple the normal fare. Thus, in a patent case, you only have to pay for the ticket you should have bought in the first place. No wonder so few people go to the trouble of negotiating licensing agreements. Most people don't pay until they get caught. It is truly a situation in which infringement pays.

Realizing how unlikely they are to get satisfaction in Japanese courts, Japanese firms have taken to suing in the U.S. court system and the Japanese legal system is thus being bypassed. Japan's Patent Law was amended in 1998, changing the old provision about paying the normal 3% licensing fee in the case of patent infringement to a new provision, setting an appropriate fee in the light of the circumstances in each individual case. At the same time, the standards for proving damages were eased, and it is now enough to show how many of the illegal products the offender has sold. In cases of corporate infringement the maximum fine has been raised to 1.4 million dollars, from only 45,500 dollars before the amendment. Yet even these amendments do not go far enough.

## 8.4 The Globalization of Damage Assessments

Patents need to offer strong protection. People who have used their intellectual resources constructively deserve protection worldwide. Just as patent information is now available worldwide in technical reports, it is very likely that international standards will emerge for assessing damages in the case of infringement.

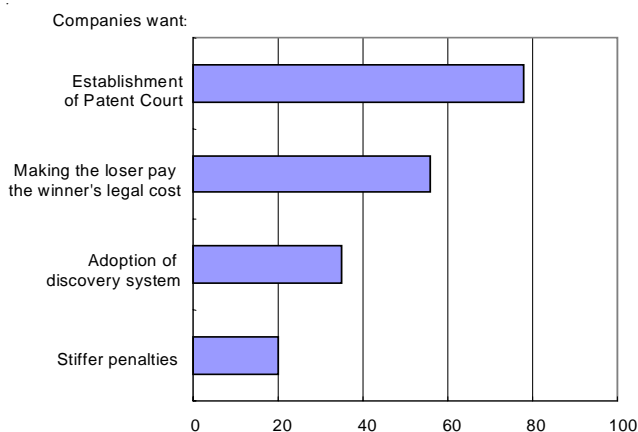
The Tokyo District Court is moving away from its old standards and raising the maximum damages that can be assessed in a patent infringement case. In one recent case, when a Canadian telecommunications company sued a Korean manufacturer for infringing on its semiconductor patent, the damages sought were about 93 million dollars. This is more than ten times the previous high (about 9 million dollars) awarded in a Japanese court. In fact, this case had already been through a first round in the U.S. and European courts. Even before the Canadian firm brought its case to the Tokyo courts, it had brought roughly similar cases in the U.S. and Germany, winning verdicts stating that there had been patent infringement. Having won these cases in the California District Court and the Dusseldorf Court, the company is now pressing its case in Japan. Japanese courts are reluctant to award massive damages unless there is overseas precedent, which is probably why the plaintiff went first to the U.S. and European courts.

The amendments to Japan's Patent Law, providing for larger damage awards, were unanimously approved by the Diet, and other specific suggestions have been made for further strengthening protection. The legislative branch is clearly aware that Japan cannot possibly hope to be an international economic power unless it provides strengthened protection for intellectual property rights.

## 8.5 Ideas for Systemic Improvements

There are a number of other things that have been suggested that would further improve the Japanese patent system. (*Chart 8.1*)

**Chart 8.1 Strong Protection for Intellectual Property Rights**



**Source:** *Corporate Intellectual Property Trends, JPO, March 1998*

### Triple Damages

First is the need to adopt a system of triple damages. While patents grant exclusive rights, they also impose an obligation to disseminate the technological information. Because the information is public, it is possible for people to use it and to produce look-alike products if they are so inclined. And because this is intellectual property, it does not disappear when someone steals it. It is not like a farm field or land where one use precludes another. Indeed, it is often very difficult even to detect that someone is using the technology illegally, and it is also difficult to prove the extent of damages. As a result, the system will continue to work to

the counterfeiter's benefit unless a system is adopted whereby the courts can assess damages at three times what the evidence indicates the actual figure might be. Even triple damages are not excessive; this is a very realistic number given the nature of intellectual property.

### **Discovery System**

Second is to adopt the discovery system. Even though patent infringement may be suspected, it is very difficult to tell exactly what production technology a company is using unless you actually go into their factory and look. But it is very rare for a company to allow a competitor to look around. Likewise, it is impossible to tell how extensive the patent infringement has been unless you actually look at the company's books and its sales figures. Even if you find a counterfeit product on the market, it is probably just the tip of the iceberg. It is extremely difficult to press a suit unless you have unfettered access to information on the other company. Thus it is imperative that Japan institute a discovery system, such as exists in the U.S.

### **Stiffer Penalties**

Third is the need for stiffer penalties. Until recently, the maximum fine for patent infringement was about 4,500 dollars, regardless of whether the offender was an individual or a company. But 4,500 dollars is a small price for a company to pay for stealing technology. Disposing of industrial waste illegally carries a maximum 909,000 dollars fine. Because a maximum of 4,500 dollars for patent infringement was obviously too little, the law was recently amended to raise this to 1.4 million dollars for companies. By the same token, if you steal things, you are liable to imprisonment up to 10 years. For stealing technology, the maximum sentence is 5 years. It hardly seems right, given the increasing importance of intellectual creativity, that stealing an idea should carry a lighter sentence than stealing a physical object.

### **Assessing Legal Costs**

Fourth is to make the offender pay the plaintiff's legal costs. In most cases, the plaintiff and the defendant pay their own legal costs. But with the damages assessed for patent infringement being so low in Japan, successful plaintiffs sometimes find that virtually the entire judgment goes to pay their legal fees. It thus seems only fair to make the person guilty of patent infringement pay the plaintiff's legal costs as well.

## Creation of Patent Courts

Fifth is the creation of patent courts specializing in patent cases. The Ministry of Justice and the courts are doing their best in patent cases. The amendment of the Code of Civil Procedure to allow the courts to subpoena documents has been a major improvement, as has the fact that people, anywhere in the country, can now file patent infringement suits in the Tokyo and Osaka district courts. In April 1998, the Tokyo District Court created a special section to deal with patent issues, and more judges have since been assigned to this section. At the same time, the Japan Patent Attorneys Association and the Japan Federation of Bar Associations set up a joint Arbitration Center for Industrial Property. In addition, the JPO is also working to beef up its own appeals procedure.

Opinion is divided in the legislative branch (the Diet) about creating patent courts. Some people say the priority should be on sharply enhancing patent protection within the current court system, and it was in line with such thinking that the Tokyo District Court established its special patent section in 1998. Others hold that Japan should create a patent court similar to that in the United States.

Still others say that the JPO should be the court of first resort in patent cases. They suggest that, because the JPO has the technological expertise, it should not only serve as the first judge in cases where an applicant appeals an examiner's decision, as is now the case, but it should also be the court of the first instance when infringement is charged. Likewise, given the need for technical expertise, such people say that medical experts should constitute a panel of judges in cases when medical malpractice is charged.

## Setting Target Schedules

Sixth is setting target schedules for decisions. The fact that court cases seem to drag on and on in Japan is another reason why many people feel that patent infringement pays. Technology grows obsolete very quickly. If a case drags on and on, it may well be that the disputed technology is out of date by the time a decision is reached. Even if an injunction is handed down to halt the counterfeiting, or if damages are assessed, this is less than effective if the offender has already stopped using the technology. In many ways, this is similar to the situation in which someone accused of election irregularities might have served out his term in office before a verdict is reached. Realizing the absurdity of such a situation, the Public Office Election Law stipulates that an effort will be made to provide a decision within 100 days. Likewise, the U.S. ITC practice is to reach a decision within one year, since a counterfeit product could easily be unstoppable on the market if the court case were too prolonged.



# 9

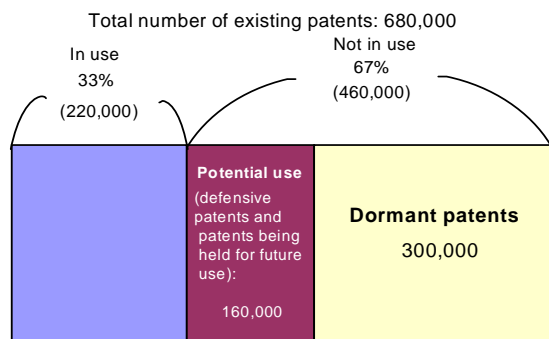
## Creating a Patent Market

### 9.1 Promoting Patent Use

Once it is understood that patents represent property, it stands to reason that they should be tradable. And it would be convenient if there were a market for them, as there are markets for fish, vegetables, and other products. Just like the real estate market or the job market, there should be a patent market. Creating such a market and facilitating the trade in patents will contribute to their more effective utilization.

There are currently 680,000 patents in Japan. Of these, 220,000 are actually being used, 160,000 are scheduled for use and some 300,000 are lying dormant. What a waste! Not long ago, patents were seen as a form of recognition for researchers, and companies made an effort to obtain patents for the sake of obtaining them. But given the need for companies to use their people, capital, and other resources to maximum efficiency, it is extremely wasteful for them to spend a lot of resources obtaining patents that they do not then use. This is also true of universities and other non-corporate research institutions. Even though they do good research, they then shut the results up and do not let anybody use them. This research ends up contributing nothing to society. It is clearly essential that better use be made of Japanese patents. (*Chart 9.1*)

Just as there are companies with wastefully dormant patents, there are also companies that would be interested in using these same patents. What then can be done to encourage the more efficient use of Japan's patent stock? Because patents are assets representing intellectual property rights, it is only natural that there should be a market where would-be buyers and would-be sellers could come together. Yet there are many people in Japan who have obtained patents, not to use them, but to keep other people from using the technology. In fact, 41% of all Japanese patents fall into this defensive 'I'm not going to use it but neither is anyone else' category. Yet given that the crux of good management is to use the

**Chart 9.1 Need to Create a Patent Market**

Dormant patents are those that the company is not using and would be willing to license to another company

Source: Report on Unused Patents, Japan Technomart, 1996

company's assets and other resources most efficiently, there is an emerging need to use patents more efficiently.

Japan also needs more start-up venture firms. In fact, this issue of encouraging greater industrial activity to revitalize the economy is one of the main issues facing Japan today. It has been estimated that Japan needs about 100,000 new companies. The United States seems to have no trouble encouraging start-ups, and the start-up rate of 14% in the U.S. is much higher than in Japan, where the start-up rate is only 4%.

What do people need to start new companies? An inventor can go ahead and start a new company with his own technology. Other people will need to find technology or start-up ideas from elsewhere. This trend has been especially pronounced in the United States, particularly since the 1980s. Increasingly, university students have started new companies using technology developed by their universities, while private individuals and SMEs have started new companies utilizing other people's patents. Japan needs the same thing. The Japanese government is promoting a program to create 100,000 new start-up companies, but this will not be possible unless more efficient use is made of creative technology developments, and many people are thus calling for the establishment of a patent market.

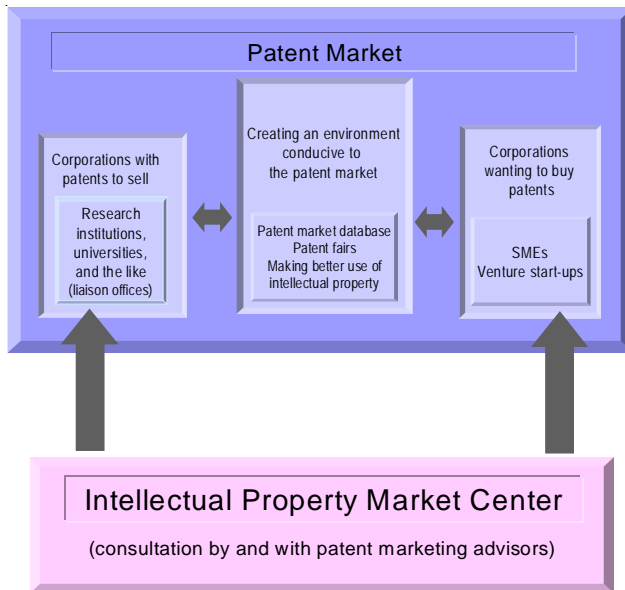
## 9.2 Establishing a Patent Market

What needs to be done to establish a patent market? For university-generated patents, the passage of the Law Promoting Technology Transfer from Universities to Industry has made it possible for university researchers to obtain patents and to

transfer them to new companies through the university Technology Licensing Office (TLO). Yet because the universities do not have patent expertise, patent advisors have had to be sent to the universities to support the TLOs in advising researchers and administrators on patents and patent licensing.

For dormant patents held by private-sector companies, the first thing to do is to make that technology accessible to other people. Only then can we talk about licensing and effective use. (Chart 9-2)

**Chart 9.2 Development of the Patent Market**



**Patent Fairs**

The first thing to be done is to hold Patent Fairs, where would-be patent users can actually talk with the people who hold the patents. These have been held nationwide in Japan since 1997 and have been very well received. They are opportunities for patent-holders to show their technology, to attract interest from people who might be able to use the technology, and perhaps even to negotiate licensing agreements. Yet because it is impossible to hold Patent Fairs all year long, Japan also needs a system of patent advisors to bring patent holders and would-be patent users together.

## A Patent Cybermarket

Second is to use electronic networking, computer networking, and other cybertechnology to create an e-market for patents. Patent information is technical information, and it should be possible to make it widely available over ordinary information networks. The Internet should make it easy for people who want to sell or license patent rights to post information about the technology involved, and for people wanting to use the technology to respond with buy offers, again using the Internet. In effect, it should be possible to create a virtual market in patents. In this spirit, Japan Technomart has made its computer system available and called upon companies to post information about their patents. Happily, a large number of companies have responded and there is a strong listing on the site.

Someone accessing the Japan Technomart Website can see the sell offers and the buy offers on the patents listed there. Because there is also a sophisticated search function, it is possible to locate what patents you might be interested in and simply to look at the buy and sell offers on these patents. Japan is slowly developing a patent market appropriate to the computer age, and it is hoped this will be widely used.

## Patent Brokers

Third is the need to encourage brokers to facilitate the trade in patents. Because patents typically involve leading-edge technology, they are often difficult for most people to understand. Thus, we need people who can spot the unique selling points and can offer the technologies to companies that might be interested, explaining what is entailed and the possibilities which are opened up. There is a definite role for such patent brokers.

There are already about 500 in the United States, and they are active across the nation, identifying new technologies and bringing would-be sellers and would-be buyers together. This is not an easy job, but it is an essential one. As a first step toward the emergence of such patent brokers in Japan, it is necessary to develop a set of case studies that people can use to develop a feel for what this or that patent might be worth.

Can the patent technology actually be commercialized? Is there a market for the new product? This is more than technology, and it also involves a keen understanding of the economy and the various markets involved. There are many factors that have to go into assessing a patent's overall value, and the brokers will have to develop a methodology that both buyers and sellers can trust.

Such skills can come only with experience backed by theory, but there is no reason it should not be possible to set a fair price on a patent and to develop a patent market. The 500 or so patent brokers in the United States now have a decade of experience, and the United States is gradually developing a regular market in patents. While this has much in common with pricing software and other intangibles, a market should develop as trading increases. Rather than be intimidated by its theoretical complexity, it would be better to plunge right in and develop the trading methods through actual experience.

It might help to compile a list of patent brokers, so that anyone wanting help in this area could access the list by computer. Likewise, it would make sense for the patent brokers to make their records public, since it is only their actual performance that will translate into trust and credibility. Because patents are often confidential and are important corporate assets, companies are not about to hand over their trading to people they cannot trust implicitly. It is imperative that a system be put together in which the patent brokers, the patent-holders, the companies wanting to use patents, start-up companies, and everyone else can trust each other.

## Patent Mapping

Fourth is patent mapping. Just as it is often said that patent information is a gold mine of technology, it would be helpful if people wanting to use patents had a map of what is where. In the United States, this is referred to as patent mapping and mining - mining used in the sense that the mountain of patents has to be mined to get at the buried treasure. The patent map helps people to find out where to dig. Patents are classified by technology, and it takes a while to get used to the system. But a map can make things much easier. Thus the Japanese Patent Office has made a patent map available since 1997. This is a good start, although this patent map needs to be further improved, since better maps will encourage more people to go treasure-hunting.



# 10

## Intellectual Property Law in the 21st Century

### 10.1 A Basic Law for Intellectual Property

If Japan is to enter an age of intellectual creativity, it is imperative that a Basic Law for Intellectual Property be enacted and national strategy formulated.

There are already many basic laws. In addition to the Science and Technology Basic Law, there are basic laws for the environment, for national development, for consumer protection, for forestry, for SMEs, for tourism, for agriculture, for nuclear power, for education, and many more. The enactment of such basic laws is part of the effort to get the entire nation to pull together, and it would be a good idea to have a basic law on intellectual property. Such a basic law should include statements:

- supporting individual creativity and stating the desirability of a flowering of creativity, since innovation contributes to society's development,
- that the state should set forth the basic policies and be responsible for their implementation, with full deference to the need to respect individuals, individual research, and SMEs,
- on the need for an effort to be made to encourage more vigorous university research and to facilitate the transfer of the results of this research to the private sector,
- on the need for the fruits of intellectual creativity to be used fairly, in the light of their importance to fair trade and technological standardization, as well as the need to coordinate with the Anti-Monopoly Law and standardization policy,
- on the desirability of the government's taking the necessary legal, financial, and other measures,

- requiring the government to report annually to the Diet on intellectual property,
- urging the government (the Cabinet) to seek out the views of the Intellectual Property Council and to adopt a Basic Plan for Intellectual Property, including enacting the necessary budgetary measures for the Plan's implementation,
- making the promotion of the acquisition and utilization of intellectual property rights a basic policy objective. This should include having the state accelerate examinations, the creation of a database open for public use, as part of the effort to make information more widely available, and government support for compatible private-sector initiatives,
- providing appropriate protection for intellectual property, enhancing dispute settlement procedures, strengthening anti-counterfeiting policies, providing the possibility of expeditious import injunctions to keep counterfeit products from entering the Japanese market, and strengthening cooperation with international organizations and foreign governments, to ensure that Japanese intellectual property rights are fully protected overseas,
- noting the importance of promoting research and studies on intellectual property, including making intellectual property part of the school curriculum and community education programs, to ensure that everyone, from school age upwards, understands the concept of intellectual property better, and
- making the bureaucracy and judiciary better versed in intellectual property issues and endeavoring to structure and manage administrative and judiciary organizations better in the national interest.

If such a Basic Law on Intellectual Property can be enacted, it will be possible for the entire nation to work together in this area.

## 10.2 The History of the Patent Law

The first Japanese Patent Law was enacted in 1885. As such, it predates even the Meiji Constitution of 1889.

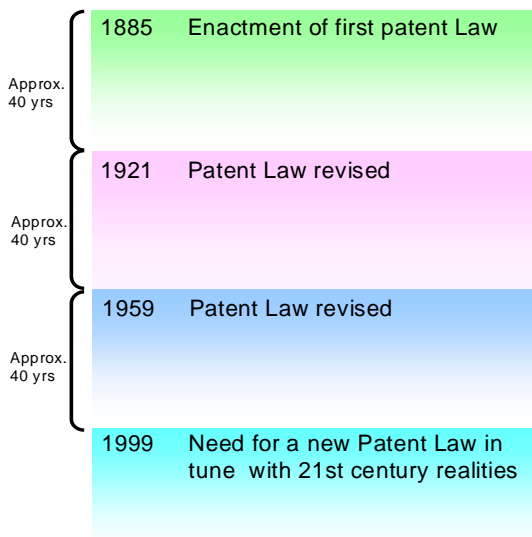
The first JPO Commissioner was Korekiyo Takahashi, who had served as interpreter to Dr Morley, who had come from the United States to help Japan formulate its educational system. Even 120 years ago, Takahashi reports that Morley complained that Japan was a nation of copiers and asserted that patents, trademarks, and copyrights were very important assets in the U.S.. Saying that he did not have the slightest idea what all of this was about, Takahashi made an effort to learn as

much about it as he could. After his service as JPO Commissioner, Takahashi went on to become President of the Bank of Japan, Minister of Agriculture and Industry, Minister of Finance, and then Prime Minister. He is today perhaps best remembered for his decisive role in calming the financial panic of the late 1920s.

Once its patent system was in place, Japan developed its technology, had its own industrial revolution and gradually grew, in the words of the time, to stand shoulder-to-shoulder with the great powers. With its technological level in the world class, Japan then amended its Patent Law in 1921, to bring it into line with contemporary realities. The legal environment was completely different after World War II, with a new Constitution, the Anti-Monopoly Law and extensive reforms to the Civil Code, and so the Patent Law was again overhauled in 1959.

In retrospect, the Patent Law seems to have been revised every 40 years or so - which would make it due for another round of up-dating amendments in 1999. In the postwar decades, Japan has generally caught up with the West technologically and is now in the position of being chased by the emerging Asian economies. At the same time, the scope of patent coverage is gradually shifting from physical things to intangible services and ideas. Japan needs a new Patent Law suited to the new age. The 21<sup>st</sup> century is bound to be a century of information, and it is imperative that the 21<sup>st</sup> century Patent Law include design law, trademark law, and other areas relative to the new era. (*Chart 10.1*)

**Chart 10.1 History of Patent Law in Japan**



## 10.3 A New Patent Law

Intellectual property rights today are divided into intellectual creations and business designations. The various laws that are needed to protect these intellectual properties can be split into two groups in the same way. The Patent Law, Utility Model Law, Design Law, Unfair Competition Prevention Law, and Copyright Law are to protect intellectual creations. The Trademark Law and Unfair Competition Prevention Law cover business designations.

However, these things have become very intermixed of late. Inventions are protected under the Patent Law, designs under the Design Law, trade secrets under the Unfair Competition Prevention Law, copyrights under Copyright Law, and trademarks under the Trademark Law. But Patent Law has been extended to cover software and other intangible products, and it is unclear exactly how it relates to the Copyright Law and where the dividing line might be.

With the recent amendments to the Unfair Competition Prevention Law, it is now possible to gain protection for things which might not be protected patents, or even registered as designs or trademarks, if in fact they are in use and have been infringed. This is a revolutionary change. Because the Unfair Competition Prevention Law takes the basic stance that it is wrong to copy someone else's work, it ends up covering everything. This provides a complex legal tangle.

Changes are also underway in the period of protection. Inventions have generally been protected for 20 years from the date of filing, and copyrights for 50 years from the creator's death. Not surprisingly, questions have been raised about this disparity. At the same time, questions have also been raised about the wisdom of according the same kind of copyright protection to a company that develops software for commercial use, as is given to someone who writes a novel or paints a picture.

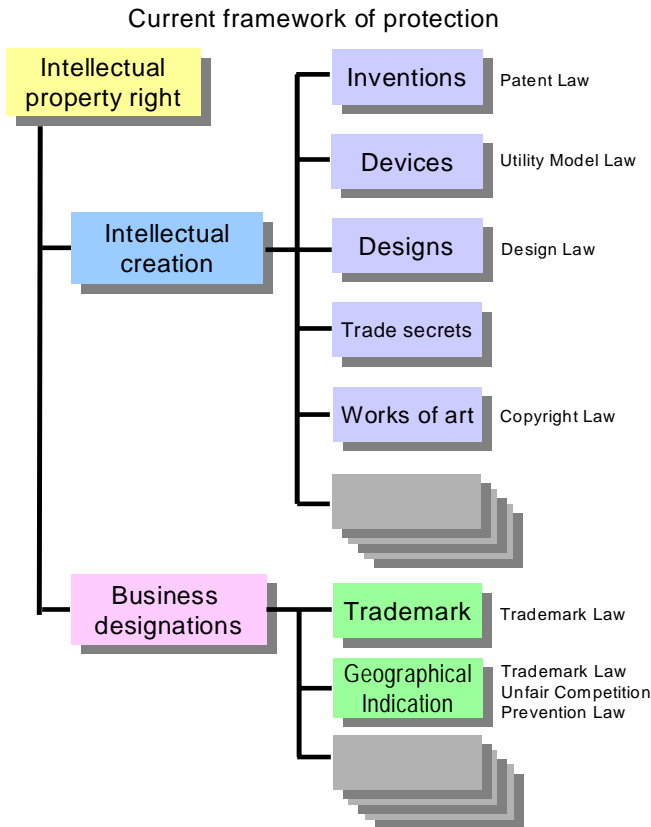
Because this legal morass has become a problem in practical terms, it is imperative that the entire structure be reorganized and brought into line with the new era. (*Chart 10.2*)

## 10.4 Development of Laws Pertaining to Intellectual Property

### From Real Rights to Information Rights

The Civil Code divides rights into real rights and claims. Of the two, intellectual property rights are currently closer to the concept of real rights, and are treated as a sub-set of real rights. If patents were claims, there would have to be a con-

Chart 10.2 Need for a New Legal Framework



tract between the two parties, but patents require no such contract, making them more like real rights. Basically, the law says that intellectual property, as property, should be registered for protection in the same way as land or buildings, and that such registration is a prerequisite to setting up a claim against a third party. Yet in actual fact, there are major differences in how intellectual property rights and other real rights are used in business. It is impossible to make a copy of land, or to imitate it, but both of these things are very possible with patented technology. In addition, it is possible for a number of people to infringe on a patent at the same time, even though the same number of people might not be able to illegally occupy a plot of land at the same time. It is clear that the concept of real rights alone cannot adequately protect intellectual property.

In fact, it would be better to see intellectual property rights as information rights. Information rights are very different from real rights. As society progresses, it will become increasingly necessary to postulate three categories of rights: real rights, claims, and information rights.

Information is not exhausted by its consumption, and any number of people can use the same information. In this way, information is very different from real property. While it is difficult for several people to commercially use the same plot of land at the same time, it is easy for several people to use a patent at the same time. And imitation is equally easy with information. Information knows no borders, and this freedom is bound to grow as the Internet spreads and advances. It is very difficult for the state to control information.

Patent Law has long been considered a special case under the Civil Code and the Code of Civil Procedure. And yet, as technology has advanced, information has become more and more difficult to protect under the general provisions of the Civil Code and the Code of Civil Procedure. It is thus crucial that intellectual property rights be treated as a third category of information rights, separate and distinct from real rights and claims, and that new protections be devised for this new category of rights, since it does not fit neatly under the general provisions of the Civil Code or the Code of Civil Procedure. The march of civilization will come to a standstill unless this is done.

## Expanding the Scope of Protection

The scope of protection has recently undergone a marked expansion, and the trend is to extend patent coverage to all manner of products of intellectual creation. Thus, mathematical solutions are patented, as is software. In medicine, the focus used to be on patents for production technologies. After substances became patentable, pharmaceuticals themselves were patented. Now we are seeing protein structures and even human genes being patented.

While the Japanese Patent Law defines an invention as “the highly advanced creation of technical ideas by which a law of nature is utilized,” there are more and more patent applications in which it is impossible to specify what natural law the technology utilizes. If Japan is not to be left behind, it is imperative that the definition be revised, to afford protection to the total range of ideas that deserve protection.

## Widely Used Trademarks

It used to be that trademarks were for manufactured products. But recently, trademarks have started showing up on agricultural produce. Farmers and agricultural cooperatives are using trademarks. Fish are being trademarked. Farmers are

starting to brand their rice, fruit, and other products to distinguish them and to protect them. Even universities, professional baseball teams, and the Olympic organizing committee have trademarks and license these trademarks out. The scope of protection is being expanded for the service sector as well. Almost everything is now protected as an intellectual product.

## Global Standards

Science and technology know no borders. Scientists, scholars, and corporations alike are engaged worldwide. There are corporate research institutions all over the world. And in many ways, there is a competition developing over which country is the best in which to carry out your research and development. As a result, research and development, and hence the fruits of such work, are tending to be concentrated in the countries with the strongest protection for intellectual property rights. To shy away from offering full intellectual property rights protection because “it is not the Japanese way” or “this is not part of the Japanese tradition” will simply mean that the world’s best technology will not come to Japan. This is not in Japan’s best interests. It is imperative that Japan bring its level and means of protection up to the global standard.

## Easier-to-understand Patents

Patent law is generally said to be very difficult. If you ask business leaders about patents, they are more likely than not to evade discussion with a comment about how difficult patents are. Yet the concept behind the Patent Law is not that difficult. It is simply that someone who invents something or has a good idea should submit it to the Patent Office for examination and registration, and that patent registration carries the full force of state protection.

People also have problems understanding patent specifications. Katsuo Ogawa, President of the Japan Intellectual Property Association, has commented that patent specifications are so difficult that not even the best machine translation programs using the best Japanese computers can translate them very well, and he argues that there should be some basic rules set for writing patent claims, such as requiring that every sentence have a subject and a predicate and setting a maximum sentence length of 70 characters. Yet when you ask people who actually translate patents if it is difficult, they tell you that it is not all that difficult - since they are writing for a very specialized audience and that the average lay reader is not going to understand the patent specification in the target language anyway. This is a terrible situation, mitigated only by the fact that American and European patent specifications are just as difficult.

But if patent specifications were written in language that ordinary people could understand, the technology would find wider acceptance and wider use in society at large. With the coming of the information age, it is essential that we give more thought to writing the law and patent claims in plain language that even computers can screen-translate.

### **Alleviating the Dangers of Monopoly**

It is time for Japan to realize that intellectual property rights are precious and deserving of protection – in other words, to become pro-patent. While some people are concerned that too-strong patent protection may give rise to monopolies, and to the ills that they imply, there are ways to get around that concern.

For one thing, because of the very great speed of technological innovation, a company that sits on its technological laurels and stops innovating will quickly find that it has been overtaken by the next generation of technology. For another, with global mega-competition, Japanese companies are being exposed to competition not only from their rivals in Japan but from companies all over the world. It is difficult to maintain a monopoly under such circumstances. The company not only has to be the industry-leader in Japan but has to beat out the competition worldwide. And since Japan and the Japanese market are open to foreign companies, there is little danger of monopoly's chilling effect. And third, the power of consumer choice, and the fact that consumers are today quite sophisticated, means that they simply will not buy things that are over-priced. A monopoly is thus not sustainable in today's markets. Given all of this, it is most unlikely that a pro-patent stance would invite the dangers of monopoly capitalism in Japan.

# 11

## The Outlook for Patent Attorneys

### 11.1 The Patent Attorney's Changing Functions

Established in 1899, the patent attorney system has a century of tradition behind it in Japan. Today, there are 4,000 patent attorneys active throughout Japan, performing a wide variety of duties representing people before the JPO, in the courts, in appeals to get decisions overturned, and in cases accusing other parties of infringement. As such, the patent attorney speaks in court alongside the company's representatives and lawyers.

When a patent attorney is consulted by an inventor about a new invention, he or she provides advice on drafting the specifications and filing the patent application. When the inventor is a researcher or an engineer, it is unlikely that a strong patent will be granted if an application is simply filed with the JPO, and the patent attorney can play a crucial role in supporting and polishing the case. The patent attorney can also advise inventors if similar devices have already been patented, suggest little changes to strengthen a patent application, and help in other ways to shepherd the application through the process. One does not simply obtain a patent. One patents an invention, and bringing the patent attorney's expertise into play can add the extra touches that turn an ordinary invention into a strong patent. Patent attorneys have done important work since the Meiji era in helping Japan modernize, in furthering the postwar recovery, and in advancing rapid economic development. They have contributed significantly to making Japan a patent power.

The government's Deregulation Committee has drawn up a Three-year Program for Promoting Deregulation. As part of this, the Committee has pointed out that patent attorneys, lawyers, certified public accountants and other professions are highly regulated, and often very limited in what they can and cannot do. If Japan is to continue to develop, it is essential that patent attorneys and other legal

service professionals benefit from deregulation and that a new framework be devised, in accordance with 21<sup>st</sup> century circumstances. Basically, this has to mean enabling the patent attorneys to better meet the needs of researchers, engineers, universities, corporations, and other inventors. Patent attorneys have to change, along with the changes in the patent system.

## 11.2 The Way of the Patent Attorney

Every company needs to put a four-part strategy together, encompassing management, technology, international, and legal affairs, and the patent attorney has an important part to play in each of these areas.

### Management Strategy

Looking first at management strategy, it is essential that the company makes effective use of its intellectual properties as management resources, and that its patents contribute to the company's bottom line. The company needs to consider cost-effectiveness, even in the patent area. Patent attorneys can contribute to the company's success by ensuring that its patents are sound. Yet if patent attorneys are to meet these expectations, it is important that they are familiar with, and alert to, management concerns. Once the patent attorney has this kind of business sense, he or she will be better able to judge which patents contribute to the business and which do not. Should a buyer appear for one of the company's patents, the patent attorney will be in a position to broker the negotiations and to be a key player in the patent market.

### Technology Strategy

The second area is technology strategy, where the company wants to pursue original research and development, to raise its technological standards, to innovate and to patent the kind of inventions that will open new fields of endeavor. Here, the patent attorney needs to function, not in crafting the traditional keep-away defensive patents, but in crafting patents that are responsive to this aggressive R&D stance and that empower the company.

We are entering an information age, and it is crucial that the patent attorney be computer-adept and able to ferret out information on patents, both in Japan and throughout the rest of the world. With the spread of the Internet and the Intellectual Property Digital Library, it will soon be possible for anyone and everyone to search the full range of patent information, and it is essential that the

patent attorney be able to do this better than anyone else. The market will clearly differentiate between patent attorneys who are good with information technology and those who are not. This does not mean simply looking for the prior art but also has to include being able to run computer checks on what kinds of research and development the competition is doing and how close they are to rolling out new products. Companies wanting to move into new fields, or to make other strategic decisions, will clearly come to rely upon patent attorneys who are good with information technology.

## **International Strategy**

Third, on international strategy, patent attorneys will increasingly be called upon to draft patent applications that will pass muster anywhere in the world, and provide the kind of global protection that a worldwide intellectual property strategy demands. With the increasingly global nature of business, it is essential that the patent attorney be internationally competitive. Companies will be watching to see whether entrusting the work to a Japanese patent attorney gives them a better patent than can be obtained by an American or European patent attorney. Many companies have already decided in which patent office they want to file first, given the nature of the technology, the markets, and other factors. Who can obtain the best patent will clearly be another factor in deciding where to file first, and the patent attorney's work is open to fierce international competition. It will thus be necessary for the patent attorney to be good at foreign languages, to be conversant with foreign patent law, and to have other international strengths. At the same time, it is essential that Japanese patent attorneys be able to secure protection for Japanese inventions overseas.

## **Legal Strategy**

Because it is anticipated that there will be more legal disputes over patents, and that they will be increasingly heated, patent attorneys will increasingly be called upon to craft patent claims that can withstand court scrutiny and that will provide unbreakable protection. The ability to stand up in court is especially important, and it is essential that patent attorneys be familiar with the Civil Code and the Code of Civil Procedure.

It was the establishment of the Arbitration Center for Industrial Property, in April 1998, that first focused attention on the need for the patent attorney to be able to fight patent dispute cases. This Center was jointly established by the Japan Patent Attorneys Association and the Japan Federation of Bar Associations, and it is hoped that the Center will be able to provide prompt out-of-court settlements

for patent disputes, while preserving the confidentiality of the information involved.

At the same time it will be difficult for the Japanese courts to function as well as they should in patent cases, unless patent attorney certification and status are upgraded to give fuller rein to the technical expertise that the better patent attorneys possess. Exactly what skills and qualification requirements should the patent attorney of the future have? While it is obvious that they will have to understand the technology and be closely familiar with the legal aspects, patent attorneys might also be required to take courses in the Civil Code and perhaps pass a test in the Code of Civil Procedure, as a prerequisite to being licensed to practice in every area of patent law.

# 12 Reforming Patent Administration

A national strategy is needed if Japan is to succeed in the coming information age, with its priority on intellectual creation. Screening applications and deciding what patents to issue, the JPO is exposed to the best of the world's cutting-edge technology every day, and it is hoped that patent administration will come to be a prime mover in promoting the required cycle of intellectual creativity.

## 12.1 Being First to Set Rights

This is an age of speed, with new technologies becoming obsolete almost overnight. Being the first and the best in the world to set patent rights is an important part of promoting research and development and promoting intellectual creation. This is the JPO's true duty.

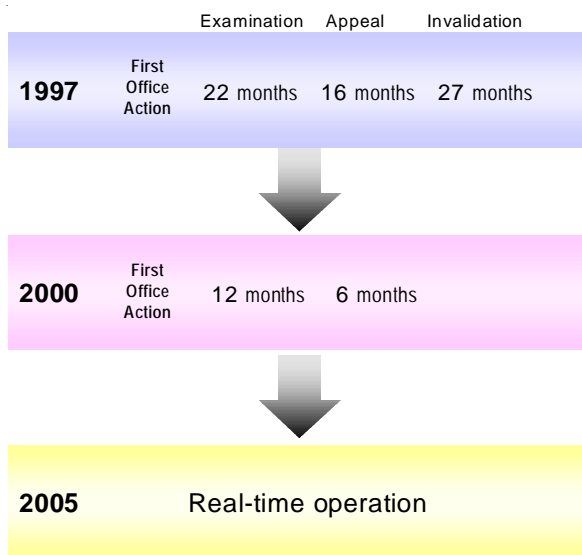
During postwar Japan's era of rapid growth, companies competed fiercely to obtain new patents. It was seen as important for a company to file more patent applications than its competitors. As in other areas, patents were subject to excessive competition. While this did contribute to enhancing the companies' technological prowess, it also created a vast backlog at the JPO. At one point, examinations took up to five years. However, the JPO added people, started making more use of computers in the screening and examination stages, and effected other improvements such that the time to first office action examination was shortened to 22 months (as of 1997). The goal is to shorten it to 12 months by the start of the new century, and to achieve real-time operation by 2005.

### Shortening the Period for Requesting Examination

The first imperative, if real-time operation is to be achieved, is to shorten the period during which a request for examination may be submitted. Under the cur-

rent system it is possible to submit an application, to get a date of filing, and then later, when the applicant decides to actually follow through on this application, to request that the application be examined. Japan allows applications to sit unexamined in this way for up to seven years - the longest period in the world. Patents that just sit unexamined like this obviously make the average examination speed look slower than it really is, and the 1999 amendments to the Patent Law provide that someone filing a patent application must either request examination within three years or forfeit the filing date. (*Chart 12.1*)

**Chart 12.1 Toward Real-Time Operation**



### Examination Quality

When people discuss the need for shortening the processing period, there are inevitably those who claim that speeding up the examination will mean sacrificing examination quality. However, it is fully possible to be both fast and good. In fact, taking a long time before or during the examination often generates a need to search for old information that would have been available if the work had been done promptly. When companies improve their productivity, they not only speed up production, but improve the quality of the output. The JPO should be able to do the same thing by using computers more, outsourcing much of the work, and otherwise improving productivity to provide a throughput that is both faster and better.

## 12.2 Information Disclosure

Just as the JPO grants an inventor exclusive rights to an invention, it also imposes an obligation to make the technology and other information public. Even though patent information is a mother lode of information, this is of no value unless it is mined and used. The JPO's Web site has been called one of the government's best. By March 1999, it had the world's largest Intellectual Property Digital Library - with information about some 40 million patents - and was accessible over the Internet not just from Japan but by researchers worldwide. In addition to these patents, the site also includes information on the laws, relevant government and ministry ordinances, examination standards, and patent statistics.

It is imperative that the JPO is not just a place that grants exclusive rights, but that it is also a gathering place for technological information and a cyber-office with a vast database that researchers can use. Indeed, it is essential that this database work to promote Japanese technological development as well as research and development around the globe. Issued in June 1998, the JPO Annual Report was a major step in that direction. Whereas previous Annual Reports had been mainly facts and data, densely printed in double columns of hard-to-read small print, the new format provides a much more accessible discussion of policy issues, patents' cultural importance and other concerns, plus the data, appropriate to the age of disclosure and transparency. As a next step, it would be good if this could be machine-translated and distributed worldwide.

## 12.3 Enhancing Customer Satisfaction

Today's patent procedures were formalized over 40 years ago. Yet companies and the economy in general are obviously very different now from what they were then. Business practices are different, as are documentation techniques. Computers have come into general use and telecommunications modalities are radically different. Even corporate ethics and accountability are different. What might have been a user-friendly administration 40 years ago is no longer seen that way, and it is imperative that the JPO figure out what today's applicants want, and how to serve today's needs. The JPO needs to be in tune with, and appreciated by, the general public.

The JPO does not develop new technologies. Rather, it tries to provide the services and create the climate needed by the companies that do develop new technologies. Thus, the User-friendly Public Services campaign was launched in 1997 to review all aspects of JPO operations, and this campaign has already resulted in 45 initiatives for enhanced user-friendliness.

It is imperative that the JPO continue working to enhance customer satisfaction for the people who file patent applications. Procedures need to be made more transparent and the JPO has to be more open and accountable. In the examination area, for example, the process should be speeded up and provisions made for holding hearings outside the big cities, and even by using teleconferencing. Likewise, it might be good to establish a system of circuit arbitrators for appeal examinations. At the same time, the JPO should be more open to a broader range of consultation, should work to improve its public information and communication efforts, and should generally provide better service.

We sometimes hear that this or that company has managed to grow into a world-class firm because of advice and other assistance it got from the JPO. This is a welcome development, and the JPO should try to be even more helpful in encouraging the emergence of large numbers of start-up firms in Japan.

## 12.4 Becoming a Global Opinion Leader

In the Meiji era (late 19<sup>th</sup> and early 20<sup>th</sup> centuries), the Japanese patent system learned from the United States and Europe. Later, in the immediate postwar recovery period, the system was extensively reformed, at American behest. Yet Japan is today a global patent power, and the Japanese system is the most computerized in the world. Japanese companies are also very patent-aware. While the U.S. is busy telling the rest of the world what it is doing wrong in patents and Europe is busy providing advice and assistance to the new governments in Eastern Europe, Japan is making its system available as a model for the developing countries - the same system that has sustained its own economic growth over the last 130 years.

Consistent with this, Japan's proposals for global patents and the Intellectual Property Cyberplan have been very well received internationally. Japan has translated the report of the Commission on Intellectual Property Rights in the Twenty-first Century, Patent Policies for 2005, and the User-friendly Public Services manual into English, and distributed copies to patent offices around the world. All of our countries face the same issues, and this Japanese input was appreciated. In some countries, the local patent offices even went to the trouble of translating these reports into the local language and passing them up to the President.

It is essential that the JPO seek out the views of corporate and university researchers, business leaders, government officials at all levels, legal professionals, and everyone else concerned with these issues. It must become a center for the drafting of intellectual property rights policies that will be consistent with 21<sup>st</sup> century requirements. In this, it is imperative that the legal framework be able to go beyond the Civil Code to create the best possible framework for the future.

## Epilogue

When I was appointed JPO Commissioner in July 1996, I was curious about what kind of person files a patent application. How do the people at start-up companies invent their new products, and how do they successfully commercialize them? Thus I was interested in meeting people from SMEs and in touring factories and research facilities. And I was surprised to hear people complain that, “the JPO is the only hope we have of protecting SME technology, but the examination takes so long that counterfeit products are taking our customers away before we even get the patent.” Knowing that seeing is believing, I visited R&D laboratories and intellectual property offices in big companies. I went to universities and talked with chancellors and deans, and I sought out their views on how the patent process impacts research and development and what they would like to see done about the problems.

In trying to get other people to tell me what they thought, I realized I had to put my own thinking on the table as well, and I embarked upon a nationwide speaking tour. I went not only to Tokyo, Osaka, and Nagoya but also to Sapporo, Sendai, Hiroshima, Takamatsu, Fukuoka, Naha, and almost everywhere else throughout Japan. I spoke with the people and sought out their views, and I made an effort to get a first-hand feel for the pulse of the country.

I went to symposia hosted by the ten leading Japanese intellectual property organizations and I was invited to speak to the economic and business organizations. I was on a Tokai University television hook-up to all of their campuses, nationwide. I spoke at Kyoto University, Ritsumeikan University and in other places. I did the whole circuit. And each time I spoke, I felt that people went away more interested in patent issues. I treasured these people's views on the system, and their criticisms. I tried to make sure that their comments, e-mail, letters, and other messages came to be part of the thinking, as we worked for systemic reforms.

I was also interested in finding out how things worked overseas, so I visited WIPO, the European Patent Office (EPO), the EU Office for Harmonization in Internal Markets (OHIM), and the American, British, German, French, and Austrian patent offices as well as those in China, Korea, Thailand, Indonesia, Malaysia, the Philippines, and Singapore. And as I saw how other patent offices handled incoming applications, how they did their examinations, and how they notified applicants, I was constantly comparing this with the Japanese situation. In some aspects, Japan was ahead of the rest of the world. In others, we had some catching up to do.

Realizing how important patents will be in the 21<sup>st</sup> century, I decided that we needed a national effort to restructure our patent system for the information age, and I asked Yoshito Arima, the former President of the University of Tokyo and Minister of Education, Science and Technology to help form a Commission on Intellectual Property Rights for the Twenty-first Century in the fall of 1996. In addition to Arima, who served as chair, the Commission included leading academicians, business leaders, media people, and others who had not been much involved in patents and were able to look at things with a fresh eye. The Commission held its wide-ranging discussions over breakfast, with the secretariat's documents distributed ahead of time so that the discussion could be as free-wheeling as possible. It was not, as several people commented, at all typical of the way the bureaucracy does things, and the Commission's thoughtful discussions culminated in a set of eight recommendations in April 1997.

These recommendations were:

- (1) to broaden the scope of intellectual property
- (2) to strengthen the protection for intellectual property
- (3) to enable universities to play a stronger role in patents
- (4) to establish a patent market
- (5) to establish cyber-patents
- (6) to help the developing countries strengthen their patent systems
- (7) to work for global patents
- (8) to mount a national effort on intellectual property rights issues

Then, based upon these recommendations, I decided to change the way the JPO operates, to realign budgeting, and to ask the companies and universities that file for patents to help me implement these changes. As part of the push for global patents, I also had the Commission's report translated into English and distributed overseas for comment. Happily, the other patent offices read the report, gave it their serious consideration, and generally declared themselves in agreement.

In the past, whenever there has been patent friction between Japan and the United States, the pattern has been for the U.S. to be on the offensive and Japan on the defensive, but after reading the report, the U.S. delegation indicated its surprise and pleasure that Japan was taking a global initiative in patents. "We are," they said, "in complete agreement with the thrust of this report. This report is in the best interests of U.S. applicants, and it will also serve to promote technological development worldwide. Our only hope is that we will be able to explain this report to the Administration and Congress and get them to go along with it." The era of Japan-U.S. patent friction is over.

As a representative of one Asian nation remarked, "We are also making an effort to put our patent house in order to further economic development, but it is hard to get the politicians to understand the patent system. Yet we had this Japanese report translated into our language, explained it to the president, and won increased staffing for the patent office."

Newly appointed WIPO Director General Dr. Idris remarked that the report outlines a joint direction that the Japanese Patent Office and WIPO can take for the future, and that he hopes Japan and WIPO will be able to join hands in taking the lead for the global patent system.

With this broad support from overseas and general agreement on what the governments should do, the Japanese, U.S., and European patent offices met in Kyoto in November 1997 and started work on specific cooperative programs toward agreement on a worldwide system for the grant of patents. Meanwhile, greater understanding has been achieved in Japan on the need to be more pro-patent in the decades ahead, including amending the Patent Law. Everyone agrees when I tell Diet members that I want to amend the Patent Law, because the situation in which patent infringement pays is counter-productive to the development of innovative technologies.

But the legal experts have all kinds of reservations. Because the Patent Law is a special law under the Civil Code, many of them say it would be wrong to carve out such major exceptions and we should first think about changing the Code's general principles. But my position is that, because the Patent Law is a special exception to the Civil Code's indemnification provisions, it has to be brought into line with patent realities lest Japan be left behind in the march of progress.

In working to amend the Patent Law, we have held meetings of the Industrial Property Council at least every month since April 1997. Seeking to get the Council to elucidate the legal thinking needed for the new era, we formed a working group of young university faculty members and held intensive discussion sessions, meeting more than fortnightly over the summer vacation. The people working on this in the JPO also gave up a lot of their days off. Because this would be the first major overhaul of thinking on compensation in 40 years, we divided this into

two stages - the things that should be fixed in the first year and the things that should be fixed in the second year. We managed to get the first-stage amendments made. This was closely watched by academics and the media, and the process sent a clear message to companies, universities, and everyone else concerned that the Japanese government will not tolerate a situation in which it pays to infringe on other people's patents.

With these changes, companies can win stronger patent protection and can feel more secure about their patents. They can assert their rights more confidently. Everyone now knows that producing counterfeits is asking for trouble, and counterfeiters are now looking for honest ways to make a living. There has been a revolution in patent awareness, and some people have referred to this as a "patent Big Bang" equivalent to the changes that are revolutionizing the financial services sector.

As part of this process, we also realized that we would have to change the way university professors think about patents before we could hope to encourage more start-up ventures in Japan, and we made a concerted effort to get the Law Promoting Technology Transfer from Universities to Industry passed, so that university research could be patented and licensed to commercial firms, and could actually benefit the whole of society. Happily, this bill was deliberated along with the amendments to the Patent Law and both bills were passed in April 1998.

The media gave this process extensive coverage and provided valuable feedback. At first, there was considerable criticism that there did not seem to be any sense of urgency about the JPO's work. Because society at large had an outdated image of the JPO as a lethargic bureaucracy, the media reminded me of the need to send a clear message that the JPO had changed and was still changing. Whenever I went out for speaking engagements or to talk with people, I sensed that there were growing expectations of the JPO. More and more people were pressing for revisions.

So I brought this information back, told everyone throughout the JPO of these heightened expectations, and tried to stir up discussion of how we could best meet society's requirements in the years ahead. Some younger patent officers formed a JPO Society discussion group, to study the issues involved. They then issued their own set of recommendations for the future. They analyzed the differences in filing behavior between Japanese and American companies and put together their own proposals for a global patent system.

Communication is fundamental if the JPO is going to contribute to the kind of society that is needed in the 21st century, and the JPO has availed itself of a wide range of means to convey its thinking and to get its information out, in line with calls for greater disclosure and accountability. As part of this, it has published *Japan's New Era of Pro-Patent* (1997), *Patents Support Venture Business* (1998), and *Era of Patent Strategy ~Pro-Patent Big Bang~* (1999), all in Japanese.

During my term as JPO Commissioner, I became keenly aware of the need to globalize intellectual property rights management and to recognize the greater role in the economy played by intellectual property rights. I looked for foreign literature on intellectual property rights policy, but found little. Thus I took it upon myself to have my own views translated into English for distribution to politicians, government officials, lawyers, patent attorneys, business leaders, academics, the media, and anyone else with an interest in intellectual property rights - both to inform their discussion and in order that their feedback could inform my own thinking.

In closing, I would like to express my deep gratitude to Mr. Yo Takagi of WIPO, Mr. Hiroshi Nishiwaki of the JPO, and Mr. Frederick Uleman of Japan Research Co. for their excellent work in the publication of this book.

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## About the Author



As the Vice-Minister for International Affairs, Ministry of International Trade and Industry (MITI) of Japan, Hisamitsu Arai is responsible for shaping Japanese government policy on all international matters discussed at the World Trade Organization, the G7 (the Group of 7 Industrialized Nations), the Organization for Economic Cooperation and Development, and other international conferences.

From 1996 to 1998, he served as the Commissioner of the Japanese Patent Office and led the nation-wide discussions on intellectual property policy which, in April 1997, resulted in the Report of the Commission on Intellectual Property Rights in the 21<sup>st</sup> Century. During his more than 30 year career at MITI, he has occupied a number of positions such as Director General of International Economic Affairs Department (1991-1992), Director General of Public Utilities Department (1992-1993) and Director General of Machinery and Information Department (1993-1994). From 1990 to 1993, he led the Japanese Delegation in the negotiations leading to the TRIPS Agreement.

Since 1998, he has been a founding Member of WIPO Policy Advisory Commission and has provided advice on intellectual property issues to WIPO.

He received a Bachelor of Arts in Law from Tokyo University in 1966, as well as a Master in Public Administration in 1972 and a Master of Arts in Economics in 1973, both from Harvard University.

He is the author of three books in the field of intellectual property: *Era of Patent Strategy ~Pro-Patent Big Bang~* (The Nikkan Kogyo Shimbun); *Japan's New Era of Pro-Patent* (Japan Institute of Invention and Innovation); and *Patents Support Venture Business* (Japan Institute of Invention and Innovation).