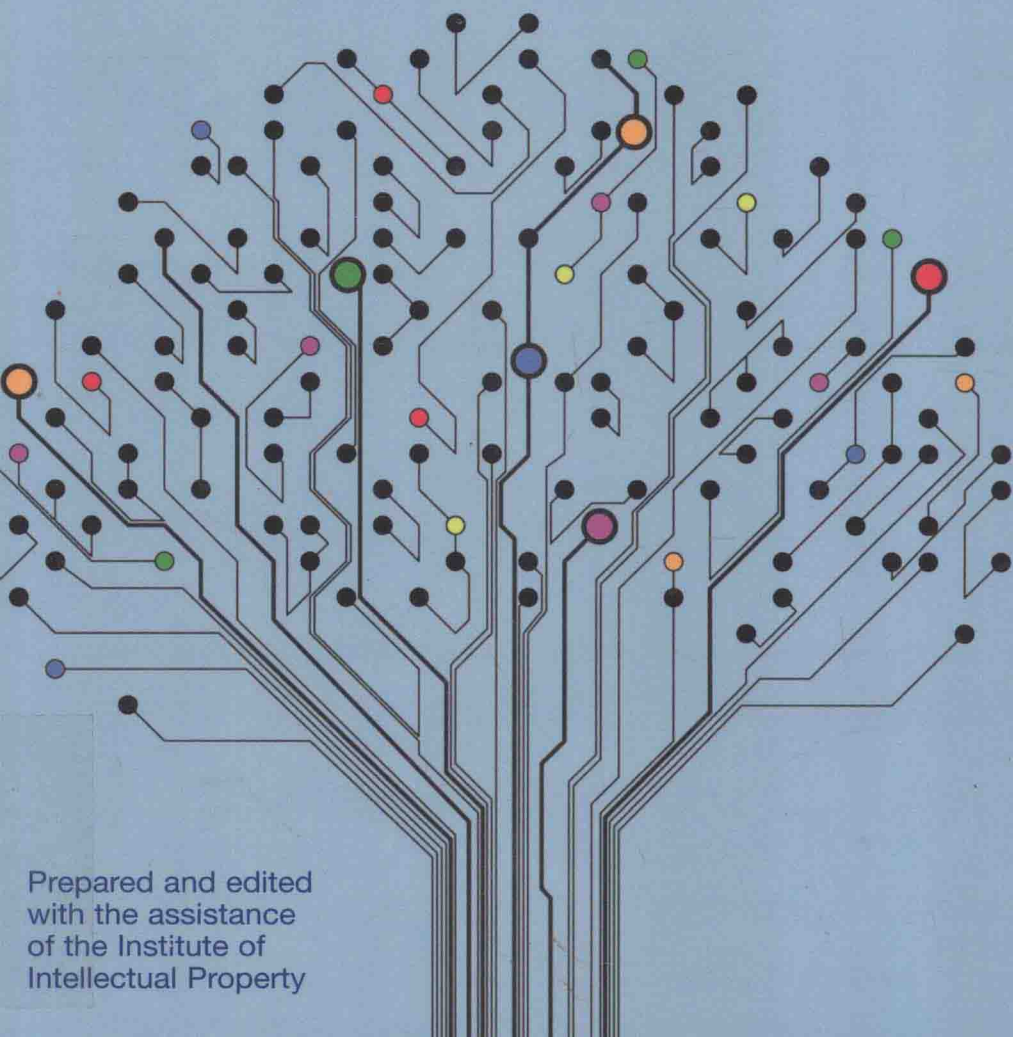




Edited by
Ryo Shimanami

The Future of the Patent System



Prepared and edited
with the assistance
of the Institute of
Intellectual Property

The Future of the Patent System

Edited by

Ryo Shimanami

School of Law, Kobe University, Japan

Prepared and edited with the assistance of
The Institute of Intellectual Property

Edward Elgar

Cheltenham, UK • Northampton, MA, USA

© The Editor and Contributors Severally 2012

First published in Japanese as *Kiro ni tatsu tokkyo seido*, Institute of Intellectual Property (IIP).

© The Editors and Contributors Severally 2009

Translated by the Contributors.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical or photocopying, recording, or otherwise without the prior permission of the publisher.

Published by
Edward Elgar Publishing Limited
The Lypiatts
15 Lansdown Road
Cheltenham
Glos GL50 2JA
UK

Edward Elgar Publishing, Inc.
William Pratt House
9 Dewey Court
Northampton
Massachusetts 01060
USA

A catalogue record for this book
is available from the British Library

Library of Congress Control Number: 2012935314



ISBN 978 1 78100 053 3

Typeset by Servis Filmsetting Ltd, Stockport, Cheshire
Printed and bound by MPG Books Group, UK

Contributors

T.G. Agitha, Research Officer, HRD Chair on IPR, Centre for IPR Studies, Cochin University of Science & Technology, India, Ph.D.

Guy Carmichael, Examiner, Scenario Analyst, European Patent Office

Shirin Elahi, Former Scenario Project Leader, European Patent Office

N.S. Gopalakrishnan, Professor, HRD Chair on IPR, Centre for IPR Studies, Cochin University of Science & Technology, India, Ph.D.

Konstantinos Karachalios, Dr., External Relations, Scenario Analyst, European Patent Office

Jay P. Kesan, Professor & H. Ross & Helen Workman Research Scholar, Director, Program in Intellectual Property & Technology Law, University of Illinois, USA

Viviane Yumy Mitsuuchi Kunisawa, Attorney at Law in Brazil, Legal Counsel at Syngenta in Brazil; Lecturer in the Post-Graduate Course in Intellectual Property Law at the University of the State of Rio de Janeiro

Mark A. Lemley, William H. Neukom Professor of Law, Stanford Law School, Director, Stanford Program in Law, Science and Technology; Partner, Durie Tangri LLP, USA

Ciaran McGinley, Controller, European Patent Office

Kazuyuki Motohashi, Professor, The University of Tokyo, Japan

Nobuhiro Nakayama, Chairman, Institute of Intellectual Property, Professor Emeritus of The University of Tokyo, Japan

Clara Neppel, Dr., Examiner, Scenario Analyst, European Patent Office

Yoichi Omori, Executive Director, Institute of Intellectual Property, Japan

Zhang Ping, Professor, Peking University, China

Berthold Rutz, Dr., Examiner, Scenario Analyst, European Patent Office

Futoshi Yasuda, Associate Professor, National Graduate Institute for Policy Studies, Japan

Foreword

A *patent* is now talked about much as a wonder boy, but we can say that it is still in its infancy, compared to *ownership*, which has a far longer history. Although its origin dates back to the Venetian patent system in the 15th century, the patent started to gain the significance we recognize today only after the emergence of factory-based machine industry during the Industrial Revolution in the 18th century. A patent system came about as a result of a time when the conventional industrial structure changed drastically, bringing about the era of mass production and mass sales. In short, the current patent system evolved as a response to the needs of the times, backed by the machinery and chemical industries which flourished during the 18th and 19th centuries.

We must not forget that a patent is not a universal right, like ownership, which exists beyond time, but has instead arisen from an industrial structure at a certain point in time. In other words, when the industrial structure changes along with changing times, the significance or *raison d'être* of the patent system must also change. Once, during the period of the French Revolution, a patent was appraised as a natural human right, but such a notion was a theory elaborated in an attempt to deprive the monarchy of its authority to grant exclusive rights. In a strict sense, a patent right was born out of the climate of the industry at a certain time in history. This also applies to copyright.

However, after a system is established, it is very hard to change or abolish it. The more people or companies involved in a system, the greater the number with an interest therein, and the greater the energy that will be required to change such a system. In the case of the patent system, almost all countries in the world have their own respectable patent offices, and most companies have their own patent divisions (or intellectual property divisions), accumulating an enormous amount of patent assets to date. A huge number of people are concerned with the patent system, namely, patent attorneys, lawyers, intellectual property judges, personnel at intellectual property divisions of private companies, employees of patent research companies, and university professors specializing in intellectual property. Furthermore, there is even an international body dealing with patent issues, the World Intellectual Property Organization (WIPO). It

is not an easy task to change the direction of a giant ship carrying such a large number of stakeholders.

Nevertheless, the world is currently going through dramatic changes, and in the future, the present time will be evaluated as a revolutionary period equal to or greater than the Industrial Revolution. The field of intellectual property is also being hit by violent waves of changes, such as the impact of digitization, economic globalization, and the sharp increase in the number of patent applications. In society, we can see the emergence of new concepts such as free software and creative commons, which cannot be explained or reasoned based on our conventional intellectual property system. It is not easy to achieve a drastic reform of the system as mentioned above, but sooner or later reform must be carried out. Without reform, the existence of the patent system will be in danger. The Japan Patent Office has set out to discuss a comprehensive reform of the patent system. The Institute of Intellectual Property needs to, at the very least, arm itself with a theoretical framework in preparation for responding to such reform, as this may be the mission entrusted it. From this standpoint, I believe this book will be the first step in the course of exploring the essence of the patent system on a global scale. The enormity of the patent system reform issue is vast as international aspects must also be taken into consideration. This book may not be able to give an answer, but I hope that it will, in some ways, clarify the issue and become the impetus for further discussion.

In my youth, I studied at the Max Planck Institute in Munich, Germany, and while studying there I had a dream that in the future a similar institute may be established in Japan. With this aim in mind, 20 years ago, I took the initiative to collect signatures from more than 100 scholars and attorneys in this field, pursuing the establishment of an institute specializing in intellectual property that would compare with the Max Planck Institute, submitted a written petition for the establishment of the institute to the Ministry of International Trade and Industry, and finally realizing the establishment of the Institute of Intellectual Property. I am filled with deep emotion to see the Institute celebrating its “coming-of-age” its 20th anniversary. The first chairman of the Institute was Mr. Gaishi Hiraiwa, then Chairman of the Tokyo Electric Power Co., Inc. (TEPCO) (who subsequently became Chairman of Nippon Keidanren). Next, Mr. Ichiro Kato, former President of the University of Tokyo, served as chairman for a long time, and then I myself succeeded to the post. Mr. Hiraiwa passed away in 2007, and Mr. Kato also passed away on November 11, 2008.

On a personal note, I became an assistant to Professor Kato in 1969 enabling my study at the University of Tokyo to continue. This was the starting point of my career as a researcher of intellectual property law.

Professor Kato, who was a great and prominent scholar in civil law, held important posts including the presidency of the University of Tokyo and the chairmanship of the Institute of Intellectual Property. The Institute achieved significant progress under the leadership of Professor Kato as its chair from 1991 to 2005. The Institute will be forever indebted to the contributions of Professor Kato and I would like to take this opportunity to pay tribute to his memory on behalf of the Institute of Intellectual Property.

Nobuhiro Nakayama
Chairman, Institute of Intellectual Property
March 2012

Preface: patent system at the crossroads

The Institute of Intellectual Property was established in 1989 by the Ministry of Economy, Trade and Industry as an institute specializing in intellectual property. In commemoration of its 20th anniversary in 2009, the Institute decided to publish this book with the hope of simulating multi-perspective discussion on the patent system and using the insights gained from the discussion to determine the future direction of the patent system. In this preface, I would like to briefly explain the loss of momentum in Japan's initiative to become an intellectual property power, the problems related to the patent system, and the risks that companies face as patent system users.

LOSS OF MOMENTUM IN JAPAN'S INITIATIVE TO BECOME AN INTELLECTUAL PROPERTY POWER

Since the establishment of Japan's Intellectual Property Basic Act in December 2002, Japan has annually devised an intellectual property strategic program in order to pursue the goal of making Japan an intellectual property-based nation. This concept of "making Japan an intellectual property-based nation" is said to have its origin in the administrative policy speech given in 2002, only eight years ago, by former Prime Minister Junichiro Koizumi. Nowadays, the media has already lost interest in intellectual property strategies, indicating that the "intellectual property boom" is over.

The majority of people feel that Japan should value intellectual property more highly than other countries. They argue that the patent system plays an important role in protecting and using innovations in light of the fact that Japan has few natural resources but has a relatively high level of innovation capability in the world. Thus intellectual property systems function as an important infrastructure to facilitate the free flow of human resources, goods, and money around the globe, which is vital to Japan because of its great dependence on trade.

These arguments are reasonable. Many people seem to support these arguments and consider the protection and use of intellectual property as

important. If this is the case, one could wonder why the “intellectual property boom” was short-lived. If intellectual property is really important, the initiative to become an intellectual property power would automatically progress and intensify. Why has the boom subsided?

Japan established its first patent law in 1885. This is earlier than the establishment of the Constitution in 1889 and the Civil Code in 1896. However, Japan’s initiative for becoming an intellectual property power did not begin until 2002 as mentioned above. Until then, the patent system had never been ranked high in national policy. What had prevented the patent system from attracting policy makers’ attention?

PROBLEMS RELATED TO PATENT SYSTEM

The slowdown of the aforementioned “making Japan an intellectual property-based nation” initiative may be attributable not to the method or system of implementing the initiative but to the various problems inherent in the patent system that had prevented patent system users from making active use of the system.

In the following sections, I will discuss five problems related to the patent system. My argument is, in short, that the current patent system has failed to catch up with the changing nature of technology development.

Failure of Catching Up to Adjust to the Great Change in the Industrial Structure

The first problem lies in the failure of catching up to adjust to the great change in the industrial structure. The recent change in the industrial structure increased the value of intangible assets in the corporate world. Consequently, an increasing number of companies obtain the results of their technology development activities in the form of information goods such as software. However, such information goods are not sufficiently protected under the current system.

As a result of a gradual change in the industrial structure since the late 20th century, the tertiary industry has become more significant than secondary industry. For example, in Japan, the total percentage of the primary and secondary industries in real domestic product was 54 percent in 1965, while the tertiary industry accounted for 46 percent. In 2000, tertiary industry increased to 66 percent.

With this change, the source of value in the corporate world shifted from tangible assets to intangible ones. Today, investment funds are no

longer flowing into companies owning a number of land properties and large-scale facilities, but into companies possessing superior intangible assets and business models. The same shift occurred in personal assets as well. With the percentage of tangible assets decreasing, the percentage of intangible assets (e.g., brands, corporate philosophy and other incorporeal assets, index funds, and real-estate trusts) has been on the rise.

Product manufacturers have also transformed themselves from mere manufacturers into something completely different in order to survive fierce competition. For example, Toyota has become one of the world's greatest companies not simply because it has produced great cars but because it has built up great intangible assets such as its manufacturing technique, known as the just-in-time inventory system, and its sales technique that has made Toyota renowned for its selling power. Against this background, it is inevitable that the patent system changes with the times. A new patent system should consider the results of technology development activities broadly as information goods and provide proper protection for such goods.

Failure of Catching Up to Adjust to the Change in the Significance of Technology Development

The second problem lies in the failure of catching up to adjust to the change in the significance of technology development. Today, technology development activities themselves are subject to fierce competition. Consequently, at any moment in time, many projects are being carried out around the world to develop similar technologies. The fact that inventions brought about the Industrial Revolution indicates that technology development was no less important a hundred or two hundred years ago. The difference is that technology development was not the major target of investment. At that time, investments were mostly made in land, facilities, and labor.

On the other hand, in the modern world, investment in land would not bring you great profit. For this, you need to invest in technology development which is why countries make it national policy to promote the development of cutting-edge technologies. Naturally, many development projects for similar technologies are concurrently carried out in many parts of the world, causing development costs to skyrocket. Under the current patent system, only a person who invented the world's most advanced technology is entitled to a patent right. Such a system of granting an absolute right exclusively to one person may be making other technology development efforts meaningless.

Failure of Catching Up to Adjust to the Change in the Mode of Technology Development

The third problem lies in the failure of catching up to adjust to the change in the mode of technology development. Nowadays, technology development activities are carried out not by individuals but by organizations.

In the past, technology development relied on the abilities of individuals. For example, in the age of the Industrial Revolution, both James Watt's steam engine and Robert Fulton's steamboat were invented by individuals. On the other hand, in the modern world, most inventions are made based on the knowledge accumulated by a great number of people over time. This indicates that highly advanced and complicated technologies are not something that individuals can invent by themselves. While the "linear model," which is a technology development model in which large research institutes play a major role, successfully created many flourishing products such as nylon, the linear model has lost its significance. In fact, nowadays, many of the successful companies such as Intel and Sun Microsystems do not have research institutes. Under a newly introduced model called the chain-linked model, research includes such activities as carrying out detailed surveys on consumer needs, procuring necessary funds, and having discussions with experts in a variety of fields. Technology development activities performed in accordance with the chain-linked model have produced a great number of improvement inventions, causing a dramatic increase in the number of patent applications.

Even within Japan, as many as several million claims are made for improvement proposals and the results of technology development activities. These inventions may be compared to a pyramid with its top consisting of a small number of important inventions that satisfy the strict criteria for industrial applicability and inventive step and with its bottom consisting of a large number of minor improvement proposals. The question is which part of the pyramid should be protected to what extent in order to contribute to industrial development most effectively.

Another change in the mode of technology development is that corporate technology development activities have become increasingly borderless. Many Japanese companies design their cars in the United States. For Japanese business executives, Japan is merely one of the regions targeted by their business.

National borders are dissolving not only in corporate activities, but also in the world of technologies. For instance, internet-related patents would be meaningless unless they ensure global protection. Suppose a patent is granted for a business model that designates Japan as the location of

a server computer and the U.S. as the location of a terminal computer. If the patent is infringed, which country's laws should be applied to the infringement?

Failure of Catching Up to Find a New *Raison d'Etre*

The third problem lies in the failure of catching up to find a new *raison d'être*. The goal of the patent system has been to promote technology development by granting monopoly rights. However, people started questioning the purpose of the patent system after seeing the success of unpatented, uncopyrighted open source software such as Unix and Linux, which are available to any person as long as he/she follows certain rules.

People developed technologies even before the establishment of the patent system. Their motives ranged from the eradication of plagues to the mitigation of the fear of war, establishment of supremacy, attainment of honor, etc. This means that technology development goes on without the patent system. The *raison d'être* of the patent system is to increase an incentive for technology development by granting monopoly rights to inventors for their benefit. However, the success of Unix, etc., shows that monetary benefit and monopolistic control are not necessarily the only incentives for technology development. For some inventors in the modern world, honor and social contribution could serve as strong incentives. The existence of various incentives aside from the incentives provided by the patent system has raised a question about what role the patent system should play in the future.

Failure of Catching Up to Cope with the Ever-increasing Applications

The fifth problem lies in the failure of catching up to cope with the ever-increasing applications.

The importance of technology development is expected to further increase in the future. As a result of innovation driven technology development, such as development activities carried out based on a chain-linked model, the number of applications filed with patent offices will increase exponentially. Unless drastic measures are taken, the increasing workload would crash patent offices around the world, leading to a collapse of the patent system as a whole. It would be necessary to emphasize that the patent system is not designed to protect innovations but designed to protect inventions. The distinction between the two blurs too often, which has resulted in the grant of more than 700,000 patents in the world every year. It is estimated that the number of patents existing in the world is at least 10 times larger than the annual grants. Which provides a greater

incentive to those involved in technology development, the vast number of patents or a few Nobel Prizes granted every year?

RISKS POSED TO PATENT SYSTEM USERS

The five problems described above pose business risks to patent system users in the corporate world. In this section, I will present some example cases where business risks arise.

Risk of Infringing Patents of Other Companies

The first risk is that companies could inadvertently infringe the patents of other companies. In the case of a company producing a product consisting of a large number of parts, it is very burdensome for the company to search for all of the related patents to prevent infringement. This problem is called “patent thickets” or “patent mines.”

Some technology fields are filled with patent portfolios. A patent portfolio would allow the portfolio-holding company to benefit from its monopolistic control over the relevant field and to prevent other companies from entering the field. For instance, no companies can compete with Toyota and Honda in the field of petroleum-electric hybrid vehicles because the two companies own patent portfolios. Their patent portfolios are said to have prevented other companies from entering the field. On the other hand, patent portfolios could make Japanese companies suffer hardships as well. For example, the Japanese computer industry in its infancy was hit by patent infringement lawsuits filed by IBM.

In particular, in the electric and machinery industry, a single product often involves hundreds or thousands of patents. When developing a product in this industry, a company has to avoid infringing any of these patents. This is not an easy task. Economists call such a dense web of patents a patent thicket and consider it one of the impediments to R&D activities and business activities. In recent years, patent thickets have been especially problematic in the field of combined technology. For example, a mobile phone functions as an information terminal, telephone, music player, and camera. In the field of combined technology, it is impossible to develop a product without infringing any of the existing patents. In order to minimize the risk of infringement litigation, companies are taking self-defense measures such as the creation of patent pools.

Each company must make continuous efforts to avoid infringing any of the large number of patents owned by other companies because a huge number of patents exist in this world as explained above; in other words,

the world is filled with patent mines. Any company conducting business in the U.S. needs to avoid infringing any U.S. patent. Any company conducting business in China needs to avoid infringing any Chinese patent. The same may be said about India, Brazil, or European countries. The globalization of economy has not globalized the world of intellectual property. For safe business operation in other countries, Japanese companies need to keep searching for patent mines that are buried in local languages and scattered across major countries and regions around the world.

An inadvertent use of another party's patent would lead to a lawsuit. In comparison with regular industrial lawsuits, patent infringement lawsuits pose much higher risks to companies. In the "pachisuro case," the Tokyo District Court ordered payment of ¥8.4 billion in damages in 2002. In a U.S. patent infringement lawsuit, the case was settled in March 1992 with a payment of ¥16.5 billion (\$127.5 million) from a Japanese company, Minolta Camera, to a U.S. company, Honeywell.

Risk that the Patents Obtained Based on the Upstream R&D Activities Could Hinder Development Activities in the Downstream

The second risk is that patent protection related to the upstream R&D activities could inevitably impose restrictions on development activities in the downstream. This risk arises because current R&D activities have a multi-layered structure.

For example, in the field of biotechnology, patents granted furthest upstream include those granted for human DNA sequences and research tools to read DNA. The grant of a patent for human DNA raised considerable controversy which subsided when it was decided that human DNA may be patented with conditions. On the other hand, research tools have already been patented, imposing substantial restrictions on development activities in the downstream in some cases. Critics still argue that the grant of patents for research tools would hinder research activities around the world. The absence of a reasonable solution to this problem has made Japanese pharmaceutical companies deeply concerned.

Risk of Losing Patent Rights

The third risk is that companies could lose patents even after registering them. There are some cases where a patent registered after due examination by patent examiners was invalidated after the patent was put to use.

In general, a property right is considered stable. Once you purchase something and own it, your property right would not be invalidated unless there are very special circumstances. For instance, you might lose your

property right if a war or political upheaval has erupted or if the property right has been acquired through a criminal act. In contrast, even in developed countries such as the U.S. and Japan, you could find your patent right invalidated under normal circumstances.

According to statistics, it is not rare to see a registered patent right invalidated and extinguished in judicial proceedings. Even after Japanese Patent Office (JPO) examiners grant a patent, the validity of that patent might be reexamined in a JPO trial. Even if the validity is confirmed in the trial, there is still a 55.9 percent chance of seeing it invalidated by a court (as of 2007). In short, even if the patent passes the JPO's examination and trial procedures, there is still about a 60 percent chance of patent invalidation.

This data shows that a patent right is inherently very unstable. This means that the validity of intellectual property rights cannot be confirmed unless they are fought for all the way to the Supreme Court. No other property rights would require such an ordeal.

What makes patent rights so unstable? Under the Japanese Patent Act, a patent will not be granted to an invention that has already been publicized somewhere in the world. This principle is called "absolute novelty." Although this principle requires, at least officially, prior art searches covering documents published all over the world, there is a limit to the extent of searches that can be performed for each patent application. The JPO examines about 300,000 applications every year. Therefore, it is impossible for the JPO to grant a patent for each invention after conducting a search on all of the technical documents published in various languages around the world and confirming that there is no existing technology that corresponds to the invention.

The JPO conducts prior art searches by using a database that contains around 70 million Japanese documents accumulated since the Meiji era, and the databases of the U.S. Patent and Trademark Office (USPTO) and the European Patent Office (EPO) to cover foreign documents mostly written in English.

The number of prior art documents keeps rising with time. The Japan Association for International Chemical Information (JAICI) has a database called the CAS (Chemical Abstracts Service), which specializes in chemistry-related information. The number of documents contained in this database increased exponentially: slightly less than 280,000 in 1961, 530,000 in 1971, 990,000 in 1981, 1.57 million in 1991, and 2.4 million in 2001. The number of documents grew 10 times over a period of 40 years. As of 2007, a breakdown of CAS documents by language shows that English accounts for 79.1 percent, Chinese 13.3 percent, Japanese 3.4 percent, German 0.9 percent, and French 0.2 percent. Ten years ago,

Chinese accounted for only 4.7 percent. The increase in the proportion of Chinese documents is noteworthy.¹ The most frequent users of this database are the examination departments of patent offices in various countries.

Losing a patent infringement lawsuit would cause enormous damage to business activities. This is why a defendant company makes every effort to invalidate the plaintiff's patent right. If the patent in question is vital to the survival of the defendant, the defendant would employ the best attorney it can find and spare no expense to conduct in-depth searches covering documents published in Russia, Eastern European countries, China, and in some cases other countries. Since the patent in question was usually registered based on the results of searches conducted with regular intensity, if the defendant conducts searches covering every document published around the world with the focus on the invention in question with no regard to the costs and time that such searches would take, a prior art document may be found in many cases.

As described above, the principle of absolute novelty inevitably keeps patent owners concerned about the possible existence of undiscovered prior art documents. This is one of the reasons why the chances of finding a patent right invalidated by a court are extremely high in comparison with other property rights. Another reason is the unclear definition of patent right. A patent right is defined merely as a technical idea specified in a document. In addition, the definition of "inventive step" is not clear enough because it is a concept that can be perceived only by highly-educated people. Consequently, in a patent infringement dispute, both sides make arguments over the allegedly-infringing goods based on vaguely-defined concepts. Such a shaky framework for patent infringement disputes has also increased the likelihood of patent invalidation.

CONCLUSION

In the preceding, I pointed out many fundamental problems inherent in the patent system. Despite all of those problems, the system has fully established its global presence. The number of member countries of the Paris Convention for the Protection of Industrial Property has increased to 171, while the number of the WTO member countries has grown to 153. It would be beneficial to gain insights from jurists and economists in Japan as well as from prominent experts in the U.S. and European countries, which are regarded as front-runners in the field of intellectual property. Furthermore, insights from rapidly developing countries such as China, India, and Brazil would be also beneficial.

The authors of this book include not only such jurists, economists, and experts in developed countries but also opinion leaders in China and India who are well versed in the intellectual property systems of their respective countries. In recent years, these countries have thoroughly examined what went wrong with the developed countries' patent systems and very carefully designed their domestic patent systems so that their systems would not suffer the same fate.

I hope this book will be useful to those who engage in designing intellectual property systems. In closing, I would like to express my deep appreciation to all of the people concerned for their kind support and cooperation rendered to the Institute of Intellectual Property over the last 20 years.

Yoichi Omori
Institute of Intellectual Property
March 2009

NOTE

1. Chemical Abstracts Services (CAS) (2008) 'CAS Statistical Summary 1907–2007'.