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Licensing Strategy of Japanese Firms

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Keywords

licensing business, resource-based view, alliance, blue LED lawsuit, capital relationship

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1. Introduction

Expressions such as *license* and *right to use* have become increasingly common with the proliferation of personal computers. This paper reevaluates licenses, including rights to use computer software as well as licenses associated with intellectual property rights such as patent rights, from a larger perspective with respect to the “licensing business.” Further, this paper aims to reinstate licenses as the fundamental component of business by examining their functions within the broader framework of business cooperation and alliances.

For this purpose, first, we have illustrated the realities of the license business and provided a basic description of patent license negotiations. For instance, when a company is faced with the decision of whether or not it should obtain a patent right owned by another company, it will first compare the license fees with the costs of avoiding the patent. Subsequently, a patent license agreement will be reached only if it is less expensive to pay the royalty and obtain the license for that right. When such a comparison is being made, the company’s business options will include the possibility of forming an alliance based on a license.

Second, we have discussed cases in which capital relationships are involved. Licenses and patent license agreements are insufficient for binding the licensee if the licensor desires to ensure firm and strict control of its licensed technology, and therefore, the need arises to consider binding the licensee through a capital relationship. This type of a strong alliance involving investment in the licensee offers a means other than royalties to secure the licensor’s profits, which would be unobtainable without a capital relationship. However, if the parent company consumes the profit without much consideration, or if such licenses restrict research and development, not only will the licensee company lose its competitive capability but also the licensor might be affected by the licensee’s poor performance.

Lastly, taking into consideration the above discussion on alliances based on licenses, the case of the so-called blue LED lawsuit involving the appropriate amount of remuneration for the invention of the blue light-emitting diode (LED), which was widely covered by the press, will be examined to better understand the realities of the licensing business and to discuss the meaning of patent rights and their value. According to the resource-based view of strategic management, excess profits of a company are created not only by a uniqueness (something extremely difficult for other companies to imitate) that the company has made

efforts to build up but also by aggressive and continual investments made by the company under conditions of uncertainty. Competitive advantage in the market, which is the source of excess sales and returns, cannot be sustained by the simple ownership of pioneer patents. On the contrary, it requires investments in high-risk research and development ahead of other companies; in fact, it is important to be the first to commercialize a product. In addition, to sustain competitive advantage, the ability to accumulate numerous patents and a high degree of know-how through the commercialization process is necessary. Furthermore, a company's development of its own manufacturing facilities is also indispensable for the establishment of competitive advantage. This was precisely the case with the development of the blue LED. Moreover, although the press coverage at the time focused almost exclusively on the amount of remuneration related to the invention, the importance of this case lies in the fact that this lawsuit was only the tip of the iceberg with regard to the whole alliance-forming strategy.

2. License Negotiations

(1) Straight Licenses vs. Cross Licenses

When a company requires a license, the simplest and easiest method to obtain one is by paying for the intellectual property rights, such as patents, held by another company. Under this type of a contract, the licensor unilaterally grants a license to the licensee, which is referred to as a straight license.

However, this type of a calm and peaceful license negotiation is extremely rare. This is because a typical license negotiation begins when the company in question receives a warning of infringement from another company. If such is the case, the company in question begins to investigate its available options by inquiring about whether or not it can question the validity of the patent (i.e., whether it is possible to invalidate the patent) or whether it is possible to prove the absence of any infringement, among other things. Only when these considerations lead to the conclusion that there is no other alternative than to obtain a working license will the company begin negotiations. If the requested royalty is within the acceptable range, as defined at a later stage in this paper, will the company purchase the license as a straight license and settle the case.

In cases wherein foreign corporations are involved, other factors must also be taken into consideration. This is because such a case provides the company concerned with another

option, allowing it to consider establishing a business alliance with the foreign corporation and competing with Japanese companies in the Japanese market. In fact, this strategy is said to have been considerably popular among Japanese firms in the past. After World War II and until the 1970s, Japanese companies were more than eager to incorporate foreign technologies; in particular, the period from 1955 to 1964 was an era of fierce competition for foreign technology imports. There were two reasons for such fierce competition. The first was that there was a vacuum in the civilian technologies in Japan due to the concentration of development in military technologies during the war, while the United States had extremely advanced civilian technologies. This fact led to the conclusion that the ability to import superior American technologies during this era was directly increase competitive advantage in Japan. The other reason was that during this period, imports of foreign technologies were regulated by the Act on Foreign Capital (hereinafter referred to as the Foreign Capital Act) and had to be individually reviewed by the Foreign Investment Council before being approved. This was because the level of foreign currency reserves in Japan was not high at the time, and the Ministry of International Trade and Industry set guidelines to regulate technology imports, for example, one company could receive a license for 60-cycle power generators and two companies, for 50-cycle models. The mere existence of these regulations encouraged even greater competition with respect to the introduction of foreign technologies (Wakumoto and Nakano, 2005).

Due to this historical background, at Toshiba Corporation, for instance, the Intellectual Property Division (formerly the Patent Division) responded only to infringement warnings from Japanese firms, while infringement warnings from foreign firms were dealt by the personnel in charge of international tie-ups (after the war, responsibility for this was transferred from the International Cooperation Division to the International Division, and then to the International Headquarters from which the responsibility shifted to the Legal Affairs Division) (Wakumoto and Nakano, 2005). In fact, Japanese companies including Toshiba were more likely to sign straight license agreements with other domestic firms and license agreements that included technology transfer arrangements with future competition and cooperation in view with foreign corporations. In sum, by considering the formation of alliances with other companies as an option, individual responses to infringement warnings are varied.

In reality, the cost of obtaining a straight license agreement covering only the patent

right in question may be considerably high in some cases; if this is the case, it is prudent to oppose the infringement warning by preparing one's own patent right prior to such negotiations. With the patent right in hand, the company can initiate a cross-license negotiation that could offset the license fees. However, a cross-license negotiation is considerably more complicated than a straight license negotiation.

When conditions other than those pertaining to the remuneration costs are taken into account, negotiation patterns can be extremely numerous, making it almost impossible to categorize them. In fact, even if they are limited to license fees, negotiations are considerably complex. The methods of payment available are based on (a) a percentage rate, (b) the pay-as-you-go method, or (c) a flat rate. Among these, the most popular method is (a), in which the required fee is based on a percentage of the net sales, for example. However, even when this method is selected for cross licensing, a cross-license agreement does not yield the calculations necessary for determining the royalty by simply offsetting the charged percentage rates of both parties. On the contrary, the processes leading to the determination of cross-licensing fees are purely business operations based on a license as the core, and an intensive negotiation process ensues based on a scrupulous estimation of the other party's contribution to one's own profits. For example, the process leading to a decision on the cross-licensing fee with a firm on equal grounds will most likely follow the pattern given below.

- (i) Evaluate the patents owned by both parties;
- (ii) Determine the products that fall under those patents;
- (iii) Identify the patents necessary for the product;
- (iv) Assess the grades of the patents;
- (v) Sign a nondisclosure agreement (NDA), and visit each other's research facilities;
- (vi) Take into account the number of new patents that may arise;
- (vii) Assume possible business plans for the products concerned independently (although these are not binding), and map the expected total sales of the product, for example, in five years;
- (viii) Multiply the expected sales amount by the determined percentage rate in order to determine the offset amount.

During the license fee determination process, the effects of the license on overall

business performance over the next several years are assessed, as well as future developmental capabilities. Although the process is typically initiated by the licensor proposing the licensing fee, the licensee generally responds with a counterclaim; as a result, the decision-making process becomes more complicated and may even differ widely from case to case. Moreover, while the companies involved may make notes of the negotiation process, they may decide not to record the process in the contract and simply state the agreed offset as the outcome of the negotiation (Wakumoto and Nakano, 2005).

(2) Comparison with Circumvention Costs

It must be emphasized that before entering into the actual license negotiations, the availability of possible avoidance tactics is always borne in mind by the company. Irrespective of whether the negotiations are for a straight license or a cross license, it is considered necessary to consider the following two factors before reaching a decision with regard to either the purchase of the patent right or the payment of a royalty to use the patent.

(a) Research and development costs: In concrete terms, consideration is given to the estimated budget necessary for the company's research and development department to develop an alternative technology circumventing the patent, within, for example, three years.

(b) Litigation costs: Generally, consideration is given to the processing fees that would be incurred in requesting a trial for invalidating the patent concerned or the legal fees incurred in defending against infringement litigation along with other intracompany work required for the litigation.

Hence, even after the parties have begun license negotiations, a patent license agreement will only be concluded when the royalty fee is lower than the "circumvention costs" necessary to avoid the license fee for the patent. It is therefore believed that when huge sales are expected to be generated, the royalty fee is likely to exceed the circumvention costs even when its percentage rate relative to sales is set at a very low level, leading to the possibility of a breakdown in the licensing negotiations and subsequent implementation of patent-avoiding tactics.

Thus, in reality, royalty is not automatically derived from a predetermined percentage rate linked to the expected sales and profits. In fact, when the expected sales are

considerably large, the patent right fees and licensing percentage rate become extremely small in comparison with the expected sales figure. Moreover, it is suggested that even a percentage rate below 1% of sales may prompt a company to forfeit the option of obtaining the patent license and proceed with its own research and development in order to avoid the patent, if it involves a technology that is necessary for the manufacturing of products with a large market and large expected sales.

In other words, even when a license negotiation begins with an infringement warning concerning a patent owned by a third party, this does not always lead to the signing of a patent license agreement. If the fee is extremely high or if it is bundled with strict regulatory clauses, it is more likely that the effort to avoid or fend off such an agreement will persist, leading to the promotion of an independent development effort for the necessary technology within the company. There are as many paths to license negotiations as there are companies.

(3) Avoidance of License Negotiations

The ownership of an equally significant patent right is not the only resort that a company can opt for against an opponent's patent. For example, when another firm in the same industry holds an effective patent, the company in question may form a coalition (which can be considered as a type of alliance) with the holder of the patent concerned by requesting the holder of the patent to fight together. In another instance, based on a similar strategy, the company can choose to first take over a company that is in possession of an effective patent, following which it can begin cross-license negotiations as one of the other tactics to choose from. If the size of the company that holds an effective patent is small, it may eventually cost lesser to take over the company than to pay for infringement or royalty, which is sometimes the case in countries such as the United States. Moreover, although it is considerably rare, at times, the company may be able to avoid license negotiations by simply revealing its countermeasures to the opponent.

Wakumoto and Nakano (2005) referred to a case that involved medical equipment, namely, a magnetic resonance imaging (MRI) business that Toshiba was focusing on in the 1980s, as an example. At the time, Toshiba was a world-class player in the medical equipment business field and was regarded as a giant by companies such as General Electric Company (GE) and Siemens AG. The number of firms involved in the MRI business was limited, and Toshiba and GE were competitors in the field. Electrical and Musical Industries, Ltd. (EMI)

and GE were among the holders of the pioneer patent at the time, but EMI had been unsuccessful and had already exited the MRI business. Toshiba was manufacturing MRIs and the license for the pioneer patent held by GE was thought to be indispensable. However, Toshiba was not licensed by GE nor were there any infringement warnings from GE, but if there had been any infringement warning or litigation, the possibility of a successful defense would have been very low and the company's MRI business would have encountered a very difficult situation.

In order to strengthen its MRI business in the United States, Toshiba was planning to acquire an American firm in that field at the time and was also interested in that firm because of the patent it was holding. This was an American company called Dasonics Inc. (Dasonics), which held an exclusive license for a very important pioneer patent. Dasonics' patent was strong enough to be effective against GE's patent. Despite the fact that Dasonics was not small, its MRI business was experiencing some problems and was acquirable in terms of scale. After several years of negotiations between Toshiba and Dasonics, Toshiba's American subsidiary, Toshiba America Medical Systems, Inc., bought the MRI Division of Dasonics along with its Research and Development Division; thereafter, it established Toshiba America Medical, Inc.¹ Although the main purpose of this acquisition was the reinforcement of its American MRI business, Toshiba was able to obtain a powerful patent as a result. In short, Toshiba's move created a situation in which, if GE had issued an infringement warning to Toshiba, Toshiba would have already possessed the ability to issue a counter-infringement warning to GE based on the patent held by Dasonics and to advance the issue to a cross-license agreement between the two. As a result, no infringement warning was received from GE. Toshiba and GE were both aware of the possibility of infringement but did not take any action to correct it. By acquiring Dasonics, Toshiba was able to pursue its MRI business without any fear in terms of patents.

As is evident in this example, there are cases in which a cross-license negotiation is not even initiated, and the issue simply dies out without ever surfacing. Moreover, if the scale of the companies' businesses is approximately the same, the gain from cross licensing will be nonexistent. However, despite this fact, if the companies concerned decide to engage in cross licensing, their relationships with the other licensees will become complex. Further, over and above this, when their internal circumstances become intertwined, the relationships will be

¹ Toshiba America MRI, Inc. <http://www.toshiba-medical.co.jp/tmd/company/aboutus/history/index.html>

extremely complicated and will be incomprehensible. As a matter of fact, in the Toshiba MRI case, the owner of the patent was not the Toshiba headquarters but an American subsidiary, and taking in account cases of licenses having been granted to other companies by the subsidiary, the procedure necessary to achieve a cross-license agreement between Toshiba headquarters and GE would have become overwhelmingly complex. Therefore, the decision made by both GE and Toshiba to avoid this complexity and not conclude a cross-license agreement can be regarded as a considerably practical business decision. Moreover, infringement warnings tend to create an all-out situation in which both parties begin to make whatever claims they can procure, and consequently, they often quarrel over the validity of the patent in question even before beginning cross-license negotiations. If this is the case, the accused party will have no other option than to sue the accuser in order to defend its pioneer patent, thereby putting more time and money at stake. Therefore, it may be stated that it is logical to avoid such complexities by not engaging in a cross-license negotiation in the first place.

“Technologists” are often aggressive and prefer to take straight actions against seemingly clear-cut matters such as patents and technology; however, strategically speaking, waiting and watching for an opponent to make its move, all the while aware of the existence of an infringement, can be regarded as a viable strategy. In fact, as was the case with the MRI business, the decision as to whether or not an infringement warning should be issued is vital, and if it is to be sent, the timing is equally crucial.

3. License and Capital Relationships

Patent license agreements are not the only type of license agreements that businesses conclude. In fact, license agreements can be broadly categorized into the following three types:

- (a) Licenses for the use of rights protected as intellectual property, such as patents;
- (b) Technology transfer and trade secret agreements;
- (c) Trading of technical materials.

Among these, licenses under category (a) are legally protected by laws such as the

Patent Law and the Copyright Law. On the other hand, licenses under category (b), which are related to technology transfer and trade secrets, and those under category (c), which are related to technical materials, are not necessarily supported by written laws, albeit they are termed license agreements. With reference to licenses between Japanese and foreign companies, in postwar Japan, those under categories (a) and (b) were governed by the Foreign Capital Act, while those under category (c) were covered by the Foreign Exchange and Foreign Trade Control Act. Further, royalties for drawings are categorized under (c); however, in cases wherein patented materials are involved, license negotiations similar to those under category (a) are necessary.

Indeed, license negotiations do not necessarily end with a simple user license negotiation for a patent. Rather, a grouping resulting from alliances begins to form with the license acting as the core. For example, in the manufacturing industry, without technical transfer agreements, it would be extremely difficult not only to acquire skills in the field but also to visit facilities with a certain objective. However, if the license was to include all of these elements, the licensing of patents and contracts might not be sufficient to bind the licensees. Thus, licensors will be faced with the difficult decision of whether they should invest and form a capital relationship to bind the licensee or whether a license agreement is sufficient to bind the licensee. In short, the licensor will be confronted with the option of whether or not it should initiate a formal alliance with the licensee, with the license positioned at the very foundation of the alliance.

Alliances based on licenses will be discussed in the subsequent sections by categorizing them into (1) technological alliances based solely on patent license agreements and (2) the securing of business bases through capital relationships. This has been done because the granting of licenses and establishment of capital relationships are basically independent from each other.

(1) Technological Alliances Based Solely on Patent License Agreements

A technological alliance based solely on a patent license agreement is concluded when it is considered preferable to receive royalty by delegating modification of the product and other necessary measures to a prospective firm for a possible alliance vis-à-vis in-company development of the product according to the requirements for the new market. It is assumed that the prospective firm has a deep understanding of the target market. Such an

agreement is also concluded when foreseeable increases in the royalty due to overall growth in product sales including those of other companies assure licensor even greater overall profits, even if the licensee becomes a competitor in the same market. Moreover, a patent license agreement will be concluded when the licensor aims to recover development costs on a wide scale by establishing a de facto standard through the formation of alliances based on licenses.

Of the previously mentioned payment methods, (b) the pay-as-you-go (unit quantity) method calculates royalty on a per-piece basis, which is referred to as piece royalty. The pay-as-you-go method is usually selected for mass-produced products such as cassette tapes. As an example of an alliance based on licenses, the background story of how cassette tape royalties came to be measured by the pay-as-you-go method is worthy of note. At the time of their development, various standards for cassette tapes were competing in the market. Koninklijke Philips Electronics N.V. (Philips), which held the patents for the cassette tapes we know today as well as for tape recorders, made a strategic decision to release the patents for the cassette tape recorders that used cassette tapes free of charge. Since the system was free, manufacturers began to use it. As a result, various Philips-type cassette tape recorders were developed, eventually seizing the market by out-competing rival products and making the Philips system the de facto standard. As a result, the cassette tapes present today are all of the Philips type. However, the following question still remains: How did Philips make money if not by licensing? Considering the whole story, Philips made profits not from the cassette tape recorders but from the cassette tapes themselves by using the pay-as-you-go method, i.e., by collecting piece royalty. This led to a situation in which, despite the large number of manufacturers of cassette tape recorders, there were very few manufacturers of cassette tapes (Wakumoto and Nakano, 2005).

Traditionally, European corporations have generally valued exclusive rights and have been keen to secure monopolistic profits from patents. It is believed that most of the cases in which Japanese corporations were denied licenses for patents involved patents held by European corporations. On the contrary, until the mid-1980s, the United States had an antitrust policy referred to as the anti-patent policy that prohibited monopolies through patents, and hence, American corporations were comfortable with the idea of granting patent licenses to other companies and receiving payments in return. Although it is an extraordinary case, Radio Corporation of America, Inc. (better known as RCA) had a list of license fees for company-owned patents on a cents-per-case basis, and it traded its patents held around the world as if

they were commodities. RCA's idea was to collect development costs from radio and television entities throughout the world (Wakumoto and Nakano, 2005). Thus, different values lead to different profit-making techniques.

However, even from the American point of view, the number of licensees needs to be limited, particularly in the case of technology transfers. It is therefore extremely important for the licensor to select the licensee in the context of how much of the licensee's profit may return to the licensor, and to choose as a licensee a company that has the greatest potential of bringing in the largest profits to the licensor. Thus, it is vital to scrutinize the capabilities of potential licensees and judge whether or not they possess the technology and capital necessary to make good use of the license. In this regard, for a period of time after World War II, Japanese companies were not in a position to return any profits to the licensor even if they were chosen as licensees, and there appear to have been many cases in which American firms decided against providing licenses to Japanese firms (Wakumoto and Nakano, 2005).

On the other hand, if the licensee has considerable potential, there is the risk of "creating wolves with licenses." In other words, as is evident in the example of the American production of television sets and radios, there is a risk that while manufacturing products under a license, licensees such as Japanese electronics manufacturers can build up power and suddenly become tough competitors for the licensors. Therefore, one can never be too careful with respect to patent rights.

(2) Securing of Business Bases through Capital Relationships

A capital contribution, or in other words, the investment of capital, is implemented to create a base of some kind. Bases that have some relevance to licenses are (1) production bases in which production technologies are transferred, (2) research and development bases that cannot be separated from intellectual property and technology transfers, and (3) although they have not been highlighted until recently, sales bases, which are equally important to the conclusion of a license agreement when the ownership of sales know-how including customer lists and trademarks is taken into account. The classification of such a business entity as a wholly-owned subsidiary, a joint venture, or a case of capital participation depends on the equity held in that entity, as do the terms and conditions of the related license agreements. A wholly-owned subsidiary is a subsidiary that is completely owned by the parent company; a joint venture refers to cases in which each participant has a sufficiently large equity in the

entity concerned to block special resolutions (for example, one-third or more in Japan). Finally, capital participation refers to cases wherein an overwhelming equity is held by the stockholders of other participating companies or by an unspecified number of stockholders, and the participant does not have the power to block a special resolution.

Let us consider the following question: If a Japanese manufacturer decides to establish a wholly-owned subsidiary in China in order to build a factory, will it be necessary for a license agreement to be concluded between the Japanese parent company and the local subsidiary? The motive behind the signing of a license agreement with a wholly-owned subsidiary lies in the circumstances of the country in question; particularly, its tax regulations. In a case in which the parent company decides to charge the wholly-owned subsidiary technology transfer fees, if the subsidiary can deduct the costs as deductible expenses, a license agreement will tend to be concluded. However, while the subsidiary might be able to deduct the expenses, the fees must be posted as earnings in the parent company's country. On the contrary, if they the expenses not deductible, it is more likely that a license agreement will not be concluded. In fact, most countries, including Japan, generally accept the technology transfer fees paid by wholly-owned subsidiaries as deductible expenses. If the subsidiary is located in a developing country, there is a risk of it being nationalized, and in such a case, the existence of a license agreement may lead to a favorable outcome. Unfortunately, an overview of history suggests that there is no guarantee regarding this point.

In the case of a joint venture, although the participating companies are able to block special resolutions, the entity is not wholly owned, thereby making a technology transfer without a license agreement unimaginable. There is, however, another objective in this, i.e., to receive part of the profits as technology transfer fees before receiving profits in the form of dividends. Moreover, in the case of a joint venture, a contract that assumes the possibility of the venture business being spun off is necessary. At the same time, care must be taken to not place the joint venture in an overly subordinate position that may restrict the capabilities of the business itself. The legal effect of a license agreement concluded between a parent company and a subsidiary also differs from country to country according to each country's legal environment; thus, this should also be taken into account.

In the case of capital participation, a controlling interest based on equity and the power to veto extraordinary resolutions are nonexistent. This situation requires a relaxed style of management participation. For instance, if a company owns a 10% share of the entity's

stock, it should send only one executive to monitor the licensee so that the licensee does not disappear or does not rapidly become a “wolf.”

Regardless of whether capital relationship involves a wholly-owned subsidiary, a joint venture, or capital participation, many types of investment returns can be expected, including royalties with technology training fees, profits from exports of equipment and parts, and dividends from stocks. However, it is necessary to be wary of the trade-offs existing among them. The question is to decide at what point in time should the profits be secured. If the investing licensor has a controlling interest in the corporation, it might be able to demand a higher royalty and sell equipment and parts at higher prices. In such a case, however, the corporation concerned will have higher operating costs and will naturally be unable to realize a sizeable net profit. Moreover, if its profits are taken away as dividends, the corporation will lose its competitiveness. In particular, in the case of a joint venture with a European or American corporation, the investing firm should be aware of the prevailing European and American business concept, which is to immediately absorb internal reserves and add incremental investments when necessary. Such awareness is necessary because if both parent companies follow suit and demand their profits, the financial condition of the joint venture could become disastrous.

Japanese companies, on the other hand, have generally displayed a different propensity. While they have not normally relied on the dividends from their subsidiaries, they have traditionally preferred to build up internal reserves in local subsidiaries. This is due to the fact that it is often more profitable to pool foreign profits in foreign currency and invest them overseas than to convert them to yen and invest them in Japan. Moreover, since it is generally unacceptable business conduct to lower the prices for equipment and parts below a certain level, Japanese companies have instead tended to lower the level of royalty fees. However, since this practice has not been integrated into corporate management, prices for equipment and parts have generally been handled by the trade department, while royalties have been negotiated by the technology department one by one. Further, the final decision remains in the hands of the personnel in charge of the negotiations, while keeping in mind the local tax system and conditions for financial transactions.

(3) Case Study of Toshiba Ampex Co., Ltd.

When problems associated with licenses impact on a business alliance, research and

development can be considerably hindered. The case of Toshiba Ampex Co., Ltd. (Toshiba Ampex), discussed by Wakumoto and Nakano (2005), offers many lessons that shed light on the complex issues surrounding alliances intertwined with licenses. This was a case in which the company in question was an international joint venture that had been created as a result of a license dispute. The parent companies had no commercial incentive to form the joint venture, nor did they have the vision to nurture the technology that the subsidiary possessed. As a result, the joint venture could not survive the competition; the ensuing adverse effects were experienced by the parent companies as well.

When the magnetic tape recording system was first introduced in the 1960s, there were two pioneer patents for the recording system in Japan: one was held by an American firm called Ampex Corporation (Ampex) and the other was a Mochizuki patent that Toshiba held an exclusive license for. The so-called Mochizuki patents were those obtained by a private researcher named Tomiaki Mochizuki, who was famous for the development of an intercarrier signal detection method for television, a PPI display method for radar systems, and other technologies. These two patent licenses were indispensable for the manufacture and distribution of magnetic tape recording systems in Japan. Ampex was planning to set up a subsidiary in Japan to manufacture this product; it was seeking the necessary approval for the foundation of the subsidiary from the Japanese government, albeit threatening not to license its pioneer patent to a Japanese company if the approval was denied. However, if Ampex was not granted the license to use the Mochizuki patent, it would be unable to manufacture the magnetic tape recording system in Japan. Moreover, if both parties remained far apart, no one in Japan would be able to manufacture this system. The Japanese government therefore drew up a compromise plan stating that if Ampex granted the license to a Japanese manufacturer established as a joint venture with Ampex holding 49% of the stock and Toshiba 51%, the government would grant Ampex permission to invest in Japan and would ensure that Toshiba license its Mochizuki patent to Ampex. As a result, both corporations founded a joint venture without any definite commercial motive, the Japanese magnetic tape recording system manufacturer was able to obtain the two patent licenses, and the joint venture was able to begin successfully. Eventually, the joint venture became one of the world's major players in the industry.

On the one hand, Toshiba chose to individually manufacture and market tape recorders for home use and separately obtained the necessary license from Ampex; on the

other hand, the joint venture concentrated on the manufacture and marketing of magnetic tape recording systems for business use. Thus, the primary products of the joint venture were high-quality recorders for broadcasting and business and tape transport systems for magnetic tape recording systems used for computers. Although the products were manufactured in Japan, they were based solely on the technology provided by Ampex, one of the parent corporations, and the joint venture was, in principle, not permitted to develop an independent technology. Ampex was interfering with Toshiba's export of home-use tape recorders to the United States, and Toshiba was experiencing constraints not experienced by its competitors; however, both the parent companies and the joint venture were enjoying prosperity.

Over a period of time, Japanese manufacturers of tape recorders, particularly Sony Corporation (Sony), advanced from the home-use market to the business-use market and became competitive enough to threaten Ampex products worldwide. In the broadcasting market, Toshiba was the leading company in Japan in fields ranging from electric transmitters to studio equipment and owned more related patents than Ampex; hence, if the two corporations had collaborated, a strong international alliance could have been born. While the joint venture actually intended to realize this vision and requested the development of equipment in Japan, Ampex did not approve of the manufacturing of equipment that was not designed and planned by Ampex itself. Moreover, even Toshiba did not make strong efforts to support the joint venture so as to realize the plan; this was because Toshiba's emphasis was on a different market and because recording systems were only a small part of overall broadcasting equipment. Gradually, Ampex began to lag behind Sony, even in the United States market, and Matsushita Electric Industrial Co., Ltd. also became a strong player. Furthermore, Toshiba Ampex found itself in a tight situation in the Japanese broadcasting market. These circumstances resulted in bankruptcy of Toshiba Ampex, and although there were, of course, other reasons, the joint venture was dissolved. The parent company Ampex also went bankrupt and was bought by a large company in a different field, but eventually disappeared from the industry. This case portrays the many managerial problems that can arise from a shortsighted corporate strategy intended to avoid the creation of a wolf by suppressing the research and development capabilities of a subsidiary.

4. The Blue LED Lawsuit

Keeping in mind the abovementioned discussions on the formation of alliances based on licenses, the so-called blue LED lawsuit, which was widely reported in the media in 2004 and 2005, has been reviewed. The blue LED lawsuit was a case filed in August 2001 in which Shuji Nakamura (hereinafter referred to as “Nakamura”) sued his former employer Nichia Corporation (Nichia) for improper remuneration for the invention of the blue LED. This lawsuit was one of the many others concerning invention remuneration that were filed at the time. The blue LED lawsuit and its outcome highlight the realities of the license business, enabling us to realize that this litigation was merely one piece of a larger picture pertaining to alliance-forming strategies.

(1) Overview of the Blue LED Lawsuit

On January 30, 2004, the Tokyo District Court, a trial court, announced its decision on the blue LED case (hereinafter referred to as the “District Court decision”). The District Court decision estimated Nichia’s monopolistic profit from the blue LED to be 120.8 billion yen and Nakamura’s contribution to that profit as 50%; thus, they calculated an amount of 60.4 billion yen as the appropriate invention remuneration for Nakamura. Therefore, they ordered Nichia to pay Nakamura his claim of 20 billion yen in full as a fair price for his invention of the blue LED. Many were surprised by the large compensation, and most people in the industry as well as in the academic circles thought this amount to be inconceivable.

It should be noted here that those who considered the amount to be inconceivable never, in fact, doubted the magnitude of Nakamura’s scientific contribution. Prior to the time that the judgment was passed, Nakamura had published many books emphasizing his contribution, and had been repeatedly covered by the media. The media in general praised him in every respect. As if approving of all this excitement, Nichia remained silent until the January 2004 District Court decision (although Fujii (2002), who had conducted interviews on the development of the blue LED, had made a note in his addendum stating that differences in opinion already existed).

Subsequently, the question arises as to why the people believed the amount to be inconceivable. This was because something similar to a standard for measuring the value of intellectual property rights already existed in the business world, or more precisely, the license

business world. Hence, even for those who had never had the opportunity to be involved in license negotiations but had some business experience, the amount arrived at by the District Court decision was several orders of magnitude larger than what they had predicted. This made them feel as if the very foundations of business practice had been overturned.

The District Court decision lacked the very basic notion that an appraisal of an invention in scientific and technological terms and an appraisal in monetary terms within the business world belonged to two different dimensions and must therefore be separated. To rephrase this, the concept of the license business provides a viewpoint that is different from those used to measure the level of contribution made in scientific and technological inventions in order to reach a generally acceptable scheme when judging a reasonable remuneration for an invention.

Nichia, dissatisfied by the decision of the first trial, appealed to the Tokyo High Court. Moreover, Nakamura also appealed, raising the amount of his claim by 100 million yen. One of the authors of this paper submitted a written opinion to the Tokyo High Court Intellectual Property Third Division, the appellate court for the blue LED lawsuit, on September 29, 2004, stating the view that the litigation should be considered in light of the license business as defined in this paper (Takahashi, 2005a). The discussions in this paper were also reflected in the written opinion. The Tokyo High Court, the appellate court, announced the settlement of blue LED lawsuit on January 11, 2005. In the settlement, Nichia agreed to pay Nakamura approximately 840 million yen in total, of which approximately 600 million yen was for the invention. The remuneration for the invention of the blue LED was thereby settled for a hundredth of the 60.4 billion yen that the District Court had decided earlier, and this made headline news. In this case, although Patent No. 2628404, “Method of Depositing Nitride-Based Compound Semiconductor Crystal Layer” (hereinafter referred to as “Patent 404” by simply referring to the last three digits of the patent number) was originally the only subject at issue in the lawsuit, it so happened that the settlement amount of 600 million yen encompassed not only Patent 404 but also remunerations for other inventions in service and those in which Nakamura was the sole inventor or a joint inventor. These included inventions pertaining to 191 registered patents, four registered utility models, and 112 patent applications pending at the Japan Patent Office; corresponding foreign patents and foreign patent applications; and inventions for which patent applications had yet to be filed as well as remaining secrets as know-how. As a result, the remuneration for the invention under Patent

404 alone is considered to have been a maximum of 10 million yen when based on the calculation method used in the settlement. This means that the remuneration for the invention was devalued to a six-thousandth of the amount in the District Court decision. When we examine the level of the remuneration and the fact that the settlement encompassed all inventions in service and others, we can conclude that this settlement was in alignment with the concept of the license business.

(2) Source of the Nichia Rent

As observed in the abovementioned case study, when the realities of the license business are taken into consideration, it is evident that the simple ownership of intellectual property rights does not promise monopolistic profits. Subsequently, the question of how the concept of rents has been explained in the field of strategic management arises. In 1984, two memorable papers in the field of strategic management were published by researchers Wernerfelt (1984) and Rumelt (1984) and a group of studies on what is known as the resource-based view (RBV) appeared. The RBV attempts to explain the creation, sustenance, and regeneration of competitive advantage from the resource side of companies by linking the characteristics of the resource with its transformation (Takahashi and Shintaku, 2002).

To put it simply, in the field of strategic management, a rent is an above-average return, and until the introduction of the RBV, the source of rents was considered to be in the market as was suggested in the field of economics. For instance, Porter (1980), influenced by the field of economics, emphasized the power of the market and developed a strategy model emphasizing rents produced by monopolies and oligopolies. This “monopolistic rent” is characteristic of many such rents known for their source in the market. Monopolistic rents are created (1) when industrial concentration progresses and companies intentionally reduce output to create an artificial scarcity, and (2) when monopolistic profits are made through government protection and by companies working in collusion with each other.

While this appears to be sufficiently convincing, an analysis by Demsetz (1973) appeared claiming that the data that first seemed to have been proving the existence of monopolistic rents were in fact evidence to the existence of rents that were not a result of monopoly. Demsetz termed such a rent, created from the uniqueness of a firm, “Ricardian rent.” While monopolistic rents were created by suppressing production, Ricardian rents were created by the possession of resources of exceptional value (Ricardo, 1817) and the

unavailability of such resources due to their inherent scarcity.

As a result, at present, researchers have begun to search for rent sources that are not in the market but within companies themselves. Lippman and Rumelt (1982) sought the creation of rents in “uncertain imitability.” They stated that uncertainty creates initial heterogeneity and, at the same time, prevents homogeneity due to imitation; they believed that this is what creates rents. Moreover, Rumelt (1984) termed the mechanisms that sustain these rents “isolating mechanisms.” According to Rumelt, isolating mechanisms work as barriers to entry at the industrial level as well as at the corporate level. Moreover, they serve to prevent imitation and substitution of unique resources held by a company. Many references to the theory of isolating mechanisms can be found in the literature pertaining to strategic research, organizational economics, and industrial organization (Mahoney and Pandian, 1992). Meanwhile, Teece (1980), while seeking an efficient rationale for corporate diversification, proposed the idea that it was the difficulty of market transactions that created rents.

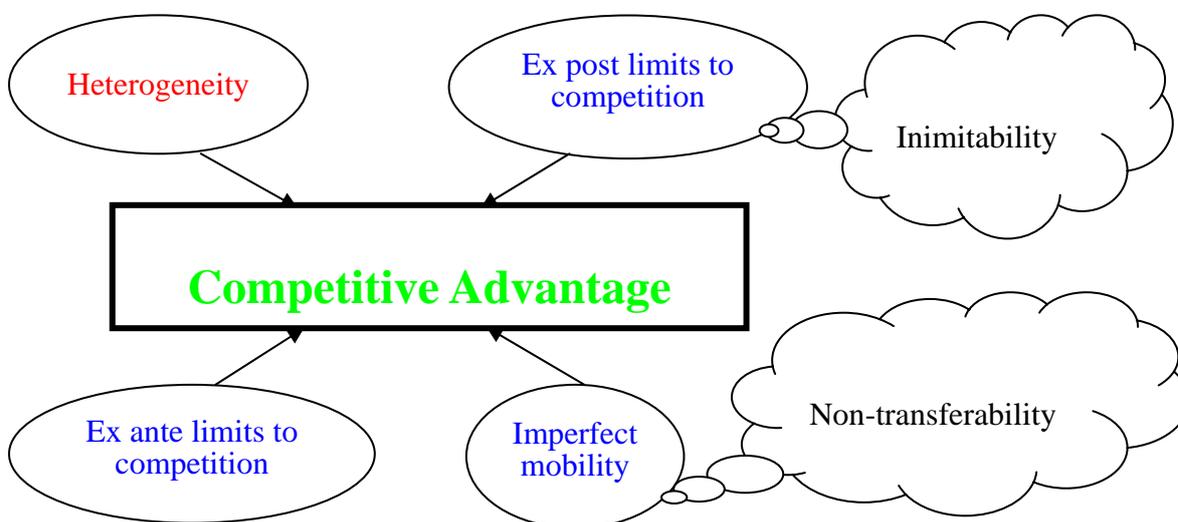
Based on these debates with regard to rent sources, the basic structure of the RBV began to materialize. In sum, sustainable competitive advantage results from (i) the uniqueness and heterogeneity of resources that create rents and (ii) the existence of mechanisms that sustain heterogeneity. Peteraf (1993) proposed points (b) to (d) as the mechanisms of (ii) and organized them in the following manner:

- (a) Uniqueness and heterogeneity of resources that create rents;
- (b) Ex ante limits to competition, or the securing of resources, whether by foresight or good fortune, by a company without prior competition, allowing it to gain above-average profits;
- (c) Ex post limits to competition, or the sustenance of rents secured by a company by subsequent limitations on competition, a concept similar to uncertain imitability (Lippman and Rumelt, 1982);
- (d) Imperfect resources mobility, or the assurance that rents will remain with a specific company, a concept similar to nontransferability (Teece, 1980).

Peteraf (1993) concluded that the resources that fulfill the characteristics of the abovementioned four cornerstones (basic conditions) can yield sustainable competitive advantage, as shown in Fig. 1. In other words, companies that are able to fulfill these four

conditions can enjoy sustainable above-average profits.

Fig. 1 Cornerstones of competitive advantage



Note: Additions made by the authors to Peteraf, 1993, Figure 3.

Based on the broader perspective offered by the abovementioned four concepts (a) to (d), the analysis of Nichia’s advantage in the blue LED market has been presented. First, in Nichia’s case, situations that were not yet anticipated when Patent 404 was developed, such as (i) the explosive popularity of mobile phones with color liquid crystal displays, (ii) the phosphor technology in which Nichia had traditionally been strong leading to the development of the white LED, and (iii) the subsequent demand for the inclusion of white LEDs in mobile phones, created excess sales and profits. The development of the white LED is the key to the above. A common understanding was that the three primary colors of light—red, blue, and green—were necessary to create white LEDs. The invention of the blue LED was thus awaited. However, the idea behind Nichia’s white LED was as simple as the idea in Columbus’s egg story, i.e., to create a white LED with the blue LED and yellow light-emitting phosphor, a unique product (invention) that only a phosphor manufacturer could develop. The development of the white LED can be judged in terms of the RBV as a typical example of mechanism (a), namely, the uniqueness and heterogeneity of resources that create rents.

Next, Nichia’s foresight or luck in being able to target its research and development investments on gallium nitride, which was said to be impossible to commercialize during the

twentieth century, while other developers were still focusing on zinc selenide for development must be acknowledged. This led to a condition that can be described by the RBV mechanism (b), namely, *ex ante* limits to competition. This provided Nichia with first-mover advantages such that it was able to enjoy the resulting profits. However, this is only one side of the coin; the other is the considerable business risk that Nichia took in choosing to follow this course of action. If an invented technology is innovative and without any similar or parallel technology, it is more difficult to predict its commercialization and whether or not it can be marketed, resulting in greater business risks when compared with proven technologies. While it is true that Taiwanese and Korean LED manufacturers are now on the rise in this industry, they are entering the field as latecomers and are manufacturing white LEDs and blue LEDs using gallium nitride, a technology proven to be commercially feasible by Nichia, thereby avoiding Nichia's patents. Therefore, the risks taken by these latecomers with respect to the research and development of their products are insignificant in comparison with those that were taken by Nichia.

Moreover, in the broader spectrum of the field of engineering invention, the establishment of a pioneer patent is usually not enough to succeed in business. Even if Patent 404 is a pioneer patent, as the District Court declared in its decision, related patents and improvement patents must guard the pioneer patent and other business resources must be mobilized in support of the pioneer patent, in order to create conditions in which business opportunities brought about by the pioneer patent can be put to effective use. In the cases of the white LED and the blue LED, Nichia's advantage in the market is not solely supported by patent rights. The manufacture of such products is made feasible only when various forms of know-how converge. In this regard, we identify the RBV concept (c), namely, uncertain imitability. This is a point that is clearly different from inventions in the fields of biology and medicine, where products can be made by the use of a single composition-of-matter patent with little support from related patents.

Furthermore, by building its own blue LED chip manufacturing facilities, Nichia was able to create, in terms of the RBV, mechanism (d), or nontransferability. This is extremely important when compared with the norms of the semiconductor industry. Although it was at one time a world leader, the Japanese semiconductor industry has over the years lost its edge. One of the reasons for its downfall is believed to be that semiconductor manufacturers did not build their own semiconductor manufacturing facilities, and instead, for example, relied on

steppers supplied by outside manufacturers such as Nikon Corporation and Canon Inc. When these manufacturers sold the same types of machines to Korean and Taiwanese semiconductor manufacturers, the advantages that had been enjoyed by the Japanese manufacturers quickly disappeared. Therefore, it is natural to assume that the fact that Nichia invested in manufacturing facilities for the blue LED chip, regardless of the business risks, helped it sustain its advantage in the market more than the patent rights did. Given the above, it can be concluded that Nichia's advantage-sustaining mechanisms were only partially supported by Patent 404. Further, it takes more than the possession of a single patent right to secure the future sales and profits of a corporation.

(3) Dependence of Patent Rights on Business Decisions

When the overall brand of a company such as its trademarks is at stake, its legal rights must be defended through litigation and other means, regardless of the cost. However, such decisions are not the norm with respect to patent rights. If it is extremely expensive to exercise one's rights and, moreover, if doing so will not yield a profit, the rights will not be exercised to begin with. For example, even if there has been an infringement of patent rights by a third party, since it is generally difficult to provide proof of such infringement, the litigation cost might exceed the amount of damages; in such cases, a company will most likely either choose not to sue the third party or not to file an application for the patent concerned in the first place.

In the case of a cross-license agreement, once the contract is concluded, a decision might be made to not request a costly substantive examination of a pending patent if it is not a pioneer patent. This is possible because not all patents that have been applied for are substantively examined; rather, only those patents for which a request for examination has been made by either the applicant or a third party, accompanied by the required examination fee, are substantively examined. A request for examination can be filed by anyone within three years from the date on which a patent application was filed (the period of within three years applies to patent applications filed on or after October 1, 2001, while for those filed before this date, the previously established period of seven years is given). If a cross-license agreement can be concluded within this period, the decision to waive a request for examination, a very costly procedure compared with the patent application, is in itself an economically practical decision. Moreover, if the licensor's objective is to compel the other party to conclude a cross-

license agreement, the frequent filing of patent applications even for minor inventions is, in the business context, a viable tactic as a means of offsetting license fees.

In sum, working toward obtaining patents means performing acts that, without a doubt, treat inventions as a tool of business. Whether the owner of a patent decides to license the patent or to manufacture products by itself and prohibit others from using the patent, patents are obtained to create business opportunities. However, that is as far as they go. In extreme cases, with the cooperation of a competent patent attorney it is said to be technically possible for even moderately innovative ideas and inventions to obtain patents, regardless of their scientific value, as is the case with business method patents (Takahashi, 2002).

Reverting back to the blue LED lawsuit, there is more that can be mentioned about it that illuminates the characteristics of the license business (Takahashi, 2006). About a year after the Tokyo High Court settlement, on March 8, 2006, Nichia officially announced that it would abandon its rights to Patent 404, which it had fought to protect through litigation. This news was also covered by various media on the following day. The modifier *officially* was added since this decision had already been reported by the press a month earlier. According to Nichia's announcement, it is the company's patent management practice to either allow patents to lapse or abandon them in order to reduce expenditures, and this applies not only to Patent 404 but also to other patents that the company has found to be no longer necessary. In 2005 alone, the company abandoned a total of 50 Japanese and foreign patents. As part of this process, on February 10, 2006, Nichia announced the abandonment of several patents including Patent 404, and since various media responded by covering the abandonment of Patent 404, the company decided to make an "official" announcement including background information.

The decision to maintain patent rights is a business decision that has to be made solely in terms of strictly business considerations, independent from the scientific value of the invention itself. It is simply a matter of weighing (a) the need for maintenance of the patent right and (b) the cost of maintaining the patent right. In fact, Nichia's official announcement clarifies this point considerably. The case of Patent 404 can be summarized in the following manner.

(a) Need for maintenance: First, Nichia itself had completely stopped using Patent 404 by early 1997. Second, the four corporations (Toyoda Gosei Co., Ltd.; Osram Opto Semiconductors GmbH; Philips Lumileds Lighting Company; and Cree, Inc.) that had

been cross-licensed by Nichia since 2002 also confirmed that they were no longer using Patent 404 to produce blue LEDs. Moreover, blue LEDs produced by firms not using Patent 404 are brighter than those produced by using Patent 404, so the abandonment of Patent 404 would not tempt other firms to begin using Patent 404. In sum, the maintenance of Patent 404 could no longer guarantee a monopoly over the production of blue LEDs.

- (b) Maintenance cost: Maintenance fees for the patents in Japan, the United States, Germany, Great Britain, France, the Netherlands, and Italy for the period beginning 2005 until the expiration dates would amount to 5.19 million yen in annual maintenance fees alone. When costs for Patent 404-related patents and other fees including processing fees for these patents are included, the maintenance cost would be two to three times greater than this.

All things considered, once the settlement had been reached, the most practical course of action was to abandon Patent 404.

5. Business Administration Viewpoint

The central issue of the blue LED lawsuit was ultimately a matter of reaching an agreement with regard to the reasonable remuneration for employee inventions (hereinafter referred to as “reasonable remuneration”), as stated in Article 35 of the Patent Law. However, it is almost impossible to resolve the problem of reasonable remuneration by treating it as a purely legal problem that concerns only Article 35 and by construing the Article without considering the realities of the license business. On the other hand, the main concerns of economists have been focused on intellectual property systems, particularly the patent system (e.g., Goto and Nagaoka, 2003), and on industrial organization analysis (e.g., Goto and Odagiri, 2003). Others have studied the issue more directly from an accounting point of view in an attempt to create guidelines for indexing intellectual property rights (e.g., Okada, 2002, 2003). From the perspective of business administration, an analytical framework based on insights acquired through the knowledge of actual corporate behavior and marketing can be provided. Takahashi (2005b) puts forward the following four points as business administration standpoints:

- (a) The monetary value of patent rights based on the realities of the license business,
- (b) Entrepreneurial profits for inventors such as researchers and engineers who decide to take risks and begin a business of their own,
- (c) Views represented by the RBV in the field of strategic management, and
- (d) The effect of monetary rewards according to the motivation theory.

Among these, the first and the third standpoints have already been discussed in this paper. Although there was a pioneering work by Saotome (1987) on the realities of the license business, regrettably it was not acknowledged in the field of business administration. (The book by Saotome (1987) went out of print after the author's death, and Hashimoto, who joined Mitsubishi Chemical Corporation (formerly known as Mitsubishi Kasei Corporation) after the original author, decided to renew its contents reflecting the changes that had occurred after its publication in both the Japanese and foreign legal systems and business practices. The revised book was published as a coauthored book, Saotome and Hashimoto in 2003.)

The second standpoint focuses on the need to take into consideration the entrepreneurial profits for inventors such as researchers and engineers (hereinafter referred to as "researchers") who decide to take risks and begin a business of their own. In the real world, although entrepreneurial profits are not as large as they are generally imagined to be, the reasonable remuneration for an employee inventor must be lower than this. This is because, if a reasonable remuneration under an employment agreement becomes greater than entrepreneurial profits, when viewed from the corporate side, options other than employment agreements that necessitate an annual salary for the duration of the person's service plus reasonable remuneration will become available; hence, corporations will decide not to opt for employment agreements.

The fourth standpoint highlights the need to understand the effect that monetary rewards can have on human motivation, according to the motivation theory. Fundamentally speaking, the amount of reasonable remuneration should not be calculated monetarily after the commercial success of a product. Instead, remuneration systems should ideally be designed with an underlying understanding of the relationship between the methods used to calculate the amount of reasonable remuneration and employees' increased motivation with respect to employment inventions. However, it is well known that remuneration systems built on monetary remuneration alone are insufficient for motivating people; thus, reasonable

remuneration should be understood as one of the rewards within an overall remuneration system that includes a wide range of intrinsic rewards under the basic employment contract.

In other words, by incorporating the abovementioned four standpoints into his investigation, Takahashi (2005b) has provided the backbone for business administration with respect to the legitimacy of the agreed settlement amount reached by the Tokyo High Court in comparison with that reached by the District Court. When the actual monetary value of patent rights is considered, a fair value of reasonable remuneration will become apparent. In addition to these standpoints, we offer the following fifth standpoint:

(e) An alliance based on license agreements.

By examining patents and license agreements from the fifth standpoint, we discover a different side to the story.

Why did Nichia battle Nakamura over the ownership of Patent 404 through litigation in the first place? The reason was because the blue LED lawsuit and its surrounding environment were part of the “need for maintenance” as described above (Takahashi, 2006). Nichia was in a situation wherein, if the ownership of Patent 404 was to belong to Nakamura, Patent 404 would become transferable to Cree, Inc. (Cree), and if that happened, there was a possibility that Nakamura might begin filing a succession of lawsuits against Nichia. Nichia, therefore, had to clarify any vagueness over the formal ownership of Patent 404 when in fact it was no longer necessary.

On September 19, 2002, an interlocutory judgment announced that the formal owner of Patent 404 was Nichia. Thereafter, on November 6 of the same year, Nichia and Cree concluded a cross-license agreement for gallium nitride-based optoelectronic technology, and all lawsuits between them were resolved in an amicable settlement. (After the January 11, 2005, Tokyo High Court settlement with Nakamura, Nichia and Cree concluded yet another cross-license agreement covering white LEDs on February 10, 2005.)

As a result of the interlocutory judgment stating that the owner of Patent 404 was Nichia, the issue of reasonable remuneration became the main focus of the lawsuit. On January 30, 2004, a District Court decision was made on what seemed like a supplementary issue at first ordering Nichia to pay Nakamura 20 billion yen, and the battle over the understanding of reasonable remuneration continued on to the appellate court. Due to these conditions, Nichia,

at the time, feared that if it announced the abandonment of Patent 404, it might result in a negative impression, leading the judges to believe that Nichia had abandoned Patent 404 to lower the amount of 20 billion yen in reasonable remuneration. The company, therefore, decided not to abandon the patent. In other words, the reasonable remuneration debate at the Tokyo High Court was only a small piece of the larger picture of alliance making. The problems associated with an alliance based on licenses were mostly resolved by the cross-license agreement concluded between Nichia and Cree soon after the interlocutory judgment of the Tokyo District Court. Although the issues surrounding this case represent one side of the license business; at the same time, we are led to believe that the court could not be relied upon when it came to making judgments on the value of patents, creating a sense of ambivalence about the options available.

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