HOW WILL *EBAY V. MERCEXCHANGE* AFFECT PRELIMINARY INJUNCTION?

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ABSTRACT

In *eBay Inc. v. MercExchange LLC*, 126 S.Ct. 1837 (2006), the Supreme Court unanimously held on May 15, 2006 that a permanent injunction under the Patent Act, 35 U.S.C. § 283, is to be granted under the "principles of equity," traditionally used by the courts of equity instead of the prior Federal Circuit's presumption that an injunction must be issued, "absent a sound reason for denying it." This paper explores the injunction relief cost problem between patentee and patent infringer after the *eBay* case. From a patentee's standpoint, their purpose in bringing the patent litigation is to obtain royalties or compensatory damages, and to immediately exclude damages caused from patent infringement. On the contrary, a patent infringer's basic desire is to obtain a beneficial position during the process of negotiation and end the litigation for a minimum cost. In order to equitably and rationality distribute cost between patentee and patent infringer, I propose four different methods of economic analysis of the preliminary injunction. These approaches are likelihood of success, patentee's damage and award compensation, the influence of the court that issued the preliminary injunction and transaction costs.

Keywords: Principle of equity; Patent Litigation; Patent Infringement; Preliminary Injunction; Transaction Costs

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I. Introduction to the Patent System and Preliminary Injunction

A. Patent system

Intellectual property represents a proprietary right in products of the human mind, often referred to as "knowledge goods," such as inventions, ideas, information, artistic creations, music, trademark, celebrity persona, industrial secrets, and customer lists.[1] Patent is a form of legal protection for intellectual property.

1. Patent Right

The patent applicant must be an inventor or the inheritor of an inventor. Employers can require, according to the employment contract, that their employees to transfer the patent obtained during their work to employers, and employers who then file an application with the U.S. Patent and Trademark Office ("PTO") become the patent title owners. If two persons create a similar invention, U.S. Patent law protects the person who first applies for the patent right to the PTO.

The other person cannot get any protection, no matter who creates the invention first. Therefore, the date of the patent application is the legal date of the invention. Conversely, in other countries, the person who invents first could obtain the patent. Therefore, it is possible that one person who invents first and gets the patent right in other countries cannot get the same right in the U.S. because another person has already applied for the patent prior to him in the U.S.[2]

2. Incentive Theories and Rent-Seeking

Whether it is a first-to-invent system or first-to-file system, the design of the patent system adopts incentive theories. That is to say that the patent system is used to promote innovation and national economic development. That means the government issues the patent to cause an artificial monopoly and ensures the inventor can obtain the benefit and offer the economic inducement of innovation. On the other hand, obtaining the patent right in itself is similar to rent-seeking. Rent-seeking means that the person employs resources to obtain benefits from others.[3] The patentee employs the research capital to obtain the patent right. It is possible that other patentees also invest in much capital to get the same result as someone who has already invested. The only difference is that the other patentee may have finished the research and development process slightly later or filed for an application later than

[1] JANICE M. MUELLER, AN INTRODUCTION TO PATENT LAW 5-10 (Aspen Publishers 2006).
[2] 35 U.S.C. § 102.
[3] DAVID D. FRIEDMAN, LAW'S ORDER: WHAT ECONOMICS HAS TO DO WITH LAW AND WHY IT MATTERS 36-8 (2001).

the first filer. When corporations waste capital on the similar research and development to obtain artificial commercial monopolies, this kind of behavior will not increase social resources. Some corporations, moreover, hold the psychology of "be the first and win first." They do not spend capital on researching and developing products, instead investing in relatively low-innovative patents, causing a waste of social resources, even influencing the foundation of the patent system itself.[4]

Therefore, the goal of the patent system is to strike a balance between incentive theories and rent-seeking. The purpose of designing the patent system is to encourage innovation, but some results from positive analysis show that the current patent system cannot reach the desired effect of stimulating innovation.[5] In addition, exclusionary patent rights encourage rent-seeking behavior. Although most view a patent as a right to exclude, the exact remedy that is available in real cases leaves open the question of how seriously this right is enforced. The legal foundation for patent rights is weak relative to that for property rights.

B. Preliminary Injunction

The Supreme Court's *eBay* decision relates to a permanent injunction. However, it is common for permanent and preliminary injunctions to have a legal basis in Patent Act, 35 U.S.C. § 283, and for injunctions to be an act of equitable discretion by the district. Therefore, this part first briefly explains procedures for preliminary injunction, and then considers the influence of the eBay Supreme Court decision on preliminary injunction to examine actions that an alleged infringer may takes in response to a patentee's requests for preliminary injunction.

1. Proceeding for Preliminary Injunction

A preliminary injunction is granted only for the period from before or during a trial to the final and binding decision, in order to maintain the status quo and prevent irreparable harm. With regard to procedural rules, Rule 65 of the Federal Rule of Civil Procedure has a general rule which regulates notice to applicants,[6] the requirements for the issuance of a temporary restraining order,[7] the security provided by applicants and the requirements for the issuance of a preliminary injunction. Preliminary injunctions are

[4] Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 Berkeley Tech. L.J. 593 (1999).

[5] Josh Lerner, *Patent Protection and Innovation over 150 Years*, Am. Econ. Rev. 92 (2) 221, 225 (2009).

[6] *See* Fed. R. Civ. P. 65(a) (1) (" Notice. No preliminary injunction shall be issued without notice to the adverse party.").

[7] *See* Fed. R. Civ. P. 65(b) (temporary restraining order).

granted only in clear cases, based on affidavits or a verified complaint and after notice to the adverse party. Preliminary injunctions require the showing of (1) likelihood of success on the merits, (2) irreparable harm absent injunction, (3) balance of hardships favoring injunction, and (4) public policy favoring injunction.[8] The district court must consider the factors and balance all the elements; no one factor is necessarily dispositive.[9]

2. Determination Standards for Preliminary Injunction and Influence of the Supreme Court's *eBay* Decision

As mentioned above, a preliminary injunction is a special remedy to protect patentee against allegedly infringing acts conducted during the proceedings. After *Smith International, Inc.*, the Federal Circuit announced four factors to take into consideration:[10] (1) whether the applicant has proved the reasonable possibility of winning the litigation on the substantive dispute; (2) the extent of harm and damages occurred if the court does not authorize the preliminary injunction; (3) whether the damage and harm imposed on the patent owner is greater than the harm caused by the issuance of preliminary injunction to the alleged infringer and; (4) whether authorizing the preliminary injunction is beneficial to the public welfare.[11] After this case, the Federal Circuit court advised the district courts to utilize these four requirements in making the decision of whether to issue preliminary injunctions.

In this section, the word "standard" is used instead of the word "factor" for the following reason. For a permanent injunction, the eBay Supreme Court decision clearly articulated that the patentee shall prove that it has the advantage in all four factors. Although it is a prerequisite for granting a preliminary injunction that the patentee has the advantage in the first and second standards, advantages in the third and fourth standards are not always pre-requisites.[12] This point has not changed remarkably, even after the eBay case.

Moreover, with respect to preliminary injunction, if a patentee fulfills the

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[8] *Tate Access Floors, Inc. and Tate Access Floors Leasing, Inc. v. Interface Architectural Resources, Inc.* 279 F. 3d 1357 (Fed. Cir. 2002).

[9] *Smith Int'l Inc. v. Hughes Tool Co.*, 718 F.2d 1537, 1579 (Fed. Cir. 1983). *See also Hybritech, Inc. v. Abbott Labs*., 849 F.2d 1446, 1451 (Fed. Cir. 1988) (explaining that the preliminary injunction "factors, taken individually, are not dispositive; rather, the district court must weigh and measure each factor against the other factors and against the form and magnitude of the relief requested").

[10] *Smith Int'l, Inc*., 718 F.2d. 1573.

[11] *Id*. This standard has been confirmed again in *H.H. Robertson Co. v. United Steel Deck, Inc.*, 820 F.2d 384 (Fed. Cir. 1987).

[12] *Reebok International Ltd. v. Baker, Inc*., 32 F.3d 1552 (Fed. Cir. 1994).

first standard, a presumption of determination on the second standard will arise in favor of patentee.[13] This is also different from the case of a permanent injunction. Since there occasionally are cases where fulfillment of the second standard is presumed even after the eBay case,[14] it can also be said that preliminary injunction has not been much influenced by the Supreme Court.[15]

As mentioned above, it can be said that preliminary injunction has not been influenced by the eBay Supreme Court decision though its legal basis is the same as that of permanent injunction. "When the patented invention is but a small component of the product the companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest. In addition injunctive relief may have different consequences for the burgeoning number of patent over business methods, which were not of much economics and legal significance in earlier times."[16] The "potential vagueness and suspect validity" of some business-method patents, Justice Kennedy said, might well affect the analysis under the four-part test.[17]

II. An Economic Analysis of the Law of Patent Litigation

From the viewpoint of economics, the patentee's purpose in bringing patent litigation is to earn a profit. Therefore, we can regard patent litigation as a kind of business transaction. The essence of business transactions is that both parties can obtain benefit from a transaction. [18] Therefore, business transactions can be finished when both of the parties believe that they have obtained benefit from a certain trade. The litigants in patent litigation seem to be engaged in a business transaction, even if the definition of benefit varies with each litigant, but only if both litigants believe that they can benefit from this business transaction will litigation come to a close. In other words, whether patent litigation is filed and how long it will go on depend on both parties believing that they can profit from the business transaction.[19]

Patent litigation is usually a high-stakes game, especially for a company found to be infringing on another's intellectual property. Obtaining a judgment on a patent litigation takes a long time, and there are myriad

[13] *Smith Int'l, Inc.*, 718 F.2d. 1575.

[14] *Christiana Indus. Inc. v. Empire Electronics, Inc.*, 443 F. Supp.2d 870, 884 (E.D. Mich. 2006).

[15] *Sanofi-Synthelabo v. Apotex Inc.*, 550 F.3d 1075 (Fed. Cir. 2008).

[16] *eBay, Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1842 (2006).

[17] *Id.*

[18] Carl Menger, *Principles of Economics* (N. Y. U. Press 1981).

[19] Ronald H. Coase, *The Nature of the Firm*, Economica 4 (16) 386, 405 (1937).

variables during the process. In addition to paying millions of dollars in damages, there is also the very real possibility of an injunction forcing a company to stop selling an infringing product. A preliminary injunction is a final court order that a party ceases certain activities permanently or performs certain acts. In order for a preliminary injunction to be issued, the patentee must show evidence of an underlying harm. All of these factors will influence the patentee and the patent infringer's willingness to engage in patent litigation. The elements in processing patent litigation under normal conditions can be expressed by the following formula:

$$Pp \times (Dp + Ip) - (Cp + Tp) > Pd \times (Dd + Id) + (Cd+Td) \quad \text{(Formula One)}$$

Pp is the patentee's opinion of the likelihood of success; Dp is the patentee's opinion of awarded compensatory damages after succeeding in the litigation; Ip is the patentee's opinion of awarded profits when obtaining the preliminary injunction; Cp is the patentee's expectation expense for lawyers and litigation during the litigation process; Tp is the patentee's expectation of other costs during the litigation process; (Cp + Tp) is patentee's expectation of transaction cost during the litigation process. Additionally, Pd is the patent infringer's opinion of patentee's likelihood of success; Dd is the patent infringer's opinion of amount to be awarded to the patentee in compensatory damages if successful in litigation; Id is the patent infringer's opinion of the loss when patentee obtain the preliminary injunction; Cd is the patent infringer's expectation expense of lawyers and litigation during the litigation process; Td is the patent infringer's expectation of other costs during the litigation process; (Cd + Td) is the patent infringer's expectation of transaction cost during the litigation process.

Therefore, in patent litigation, the patentee's expectation of net income Pp x (Dp + Ip) - (Cp + Tp) is the patentee's expectation of obtained compensatory damages due to the judgment Pp x (Dp + Ip), while also deducting the patentee's expectation of transaction cost during the litigation process (Cp + Tp). The infringer's expectation of net litigation expense, Pd x (Dd + Id) + (Cd + Td), is that expectation of compensation which the infringer needs to pay for the damage due to judgment, and (Cd + Td) adds to the infringer's expectation of transaction costs during the litigation process.

As mentioned above, it can be said that patent litigation proceeds when the patentee's expectation of litigation net income is greater than the patent infringer's expectation of litigation net loss. From the standpoint of a business transaction, the patentee's expectation of litigation net income is equivalent to the patent infringer's expectation of litigation net loss. Such a business transaction will fail, in that the seller's expectation of income is

higher than the buyer's expectation of expenditure. That is to say, the patentee's expectation of income is higher than the amount of money that the infringer is willing to pay, causing the transaction between the two sides to break down.

Moreover, the factors of influence are more complicated in patent litigation because of the characteristics of a patent, such as uncertainty and short product lifespan. The coming sections will further discuss likelihood of success, patentee award compensation for damages in favor of judgment, the influence of court-issued preliminary injunctions, and transaction costs.

A. Likelihood of Success

In general, the probability of winning litigation for the patentee and the patent infringer is always different. Both parties are unable to get all the information from the other party because the information is closed. Even if all information is disclosed, both parties may not have the same cognition and understanding about the information. Additionally, the more important issue is that both parties have different expectancies about how the court will judge the information. Furthermore, a different judge will have different judgments. The main reasons of uncertainty in these factors are as follows:

1. The Validity of a Patent

The patentee certainly thinks that the court will infer the patent right is valid after the patentee obtains the patent right. In fact, the proportion of revoked patents is more than 30 percent. Therefore, both parties in the patent litigation always dispute whether the patent is valid, and it is hard to get a common consensus until the court makes the judgment.

2. The Court Defines the Claim of the Patent

Even though the patent right's validity has been determined by court, claims of patent rights are not as clear as general property rights. Therefore, both parties in patent litigation have their own opinions about interpreting the claims of patents before the court determines definite right. Moreover, the courts have limited understanding about sunrise industries and frequently differ about claims of rights, which will influence the probability of judging which party wins the litigation.

3. The Product is Infringed or Not

To win the litigation, the patentee must prove that the patent right is valid and demonstrate the validity of the claim of the patent, and must also prove that the other party has infringed the claim of patent. First of all, the patentee must understand what kind of technology the infringing product utilizes and how this works with its patent right. Nevertheless, the patentee will have a

hard time getting the information from the patent infringer about the infringing product. Thus, the court and both parties will find different facts and receive different information during the litigation. Of course, this will influence their determination as to the likelihood of success in the litigation.

According to the above, the judicial process will expose more information during the processing of litigation. In summary, the courts will determine the validity of the patent based on the claims of each party, thus influencing the patentee's and patent infringer's expectation of probability of success in the litigation.

B. Patentee Award Compensation for Damages in Favor of Judgment

In patent litigation, the patentee obtains the benefits of a favorable judgment, which include the patentee obtaining compensatory damages and benefits due to being granted a preliminary injunction. The patent infringer's expenses in an unfavorable judgment include patentee's compensatory damages and the infringer's disadvantage due to preliminary injunction.

The court's calculation of compensatory damages includes the patentee's damages and lost profits as well as the infringer's obtained benefits from this infringement. The standards of compensatory damages cover three common situations:

1. Patentee's Damages and Lost Profits

The infringement may reduce the patentee's profit, because of either (1) diverted sales or (2) price erosion. To compete with the infringer, the patentee may reduce the price or give up raising the price to make lower profits. However, the lower price will result in increasing volume of sales, so the patentee must calculate increased volume of sales due to lower price along with (3) additional costs, such as advertisement, (4) projected lost profits, (5) damage of patentee's goodwill in the market place due to the infringer's low-grade product; and (6) loss of market monopoly. When the patent expires, the patent infringer will get into the market fast, and the patentee will lose the advantage of a monopolized market. The last three types of patentee damages and lost profits are usually too far-reaching to consider.

Therefore, when the patent infringer sells a lower-price infringing product, the patentee's product cannot sell or must be sold at a lower price (decreased income). The patentee even needs to add variable cost to sell the product (increased cost) which reduces the original profits. The calculation of decreased income can be proved by the patentee. For example, this can be found by calculating the retail price of the patent product minus cost of patent product.

2. Patent Infringer Obtains Profits from this Infringement

A patent infringer obtains profits from this infringement which can be calculated from the amount of infringing products multiplied by each unit's profit. The amount of infringing products is calculated from the date on which the infringer was informed of patent infringement to judgment. The court estimates infringer's amount of infringing product through material evidence, such as purchase orders. In general, this is calculated from the infringing product's original price. However, it is difficult to prove the sales amount of the infringing product. On the other hand, the accounting price and pricing are always have variability. Therefore, the court will consider a range of profits.

To recover lost profits damages for patent infringement, the patent owner must show that it would have received the additional profits "but for" the infringement. The patent owner bears the burden to present evidence sufficient to show a reasonable probability that it would have made the asserted profits absent infringement.[20] In patent litigation, the court judges whether the patentee has the right to calculate the loss of profit according to the infringer's income. The courts usually adopt the standard which was raised in the *Panduit* case. To obtain as damages the profits on sales the patentee would have made absent the infringement, *i.e.*, the sales made by the infringer, a patent owner must prove: (1) demand for the patented product, (2) absence of acceptable non-infringing substitutes, (3) the patentee's manufacturing and marketing capability to exploit the demand, and (4) the amount of the profit the patentee would have made.[21] If the patentee can prove the four points above, then the court in *Panduit* held that patentee can be awarded compensation which is equal to the infringer's foreseeable loss.[22]

3. Reasonable Royalty

Reasonable royalty is the lowest limited compensation for damages in patent litigation, and it can coexist with lost profits. From the viewpoint of economics, when an agent would like to manufacture or sell a patent product to create reasonable profits, he agrees to pay a royalty for permission to do so. The court calculates the amount of compensation for damages on the marketing change from the beginning of patent infringement to end of the litigation. Basically, the court hopes the patent infringer will bear the patentee's economics profits lost during the term of infringement. The court will hold the judgment that the patent infringer needs to pay some money to

[20] *King Instruments Corp. v. Perego*, 65 F.3d 941, 953 (Fed. Cir. 1995).
[21] *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152 (6th Cir. 1978).
[22] *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1546 (Fed. Cir. 1995).

cover for the patentee's economic profit lost. That is to say, the part of the loss which can be proved is real profits lost, and the other part of lost which cannot be proved should be applied to the reasonable royalty.

35 U.S.C. § 284 provides, "Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with profit and costs as fixed by the court." According to the description of clause described above, the reasonable royalty is regarded as compensatory damages.[23]

As an analytical approach in patent litigation, the amount of reasonable royalty is the patent infringer's expected profit margin to deduct normal profit margin. The reasonable royalty calculation principle can adopt the Georgia-Pacific factor to carry on assessment, including the amount of profit-making from infringing products, the appropriate share of a profitable market, and the royalty rate in this technical field.[24] Therefore, the reasonable royalty rate can be calculated by the present gross profit rate deducted from industry standard net profit.[25]

According to the discussion above, the patentee obtained profits due to a favorable judgment under this calculation method. The court's intention is to adopt standards of compensatory damages, with the disclosure of patentee's damages or lost profits and other patentee information being key points. If the court's calculations are based on the patent infringer's obtaining profits, then the infringer's information can validate this key point. On the contrary, if the court bases its calculations on reasonable royalty, then the patentee's information can validate this key point. Because authorized contracts are usually not disclosed to third parties, general authorized contract is always not limited to monetary transactions.

C. The Influence of Court That Issued the Preliminary Injunction

A preliminary injunction is entered before trial, that is, before a complete adjudication on the merits of the infringement issue.[26] A preliminary injunction is a provisional injunction issued pending the disposition of a litigation, the purpose of which is to "preserve the status quo and to protect the respective rights of the parties pending a determination on the merits."[27] However, the influence is multidimensional, and the influence degree can only be conjectured based on the existing materials. Thus, it is hard to

[23] 35 U.S.C. § 284.

[24] *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1119 (S.D.N.Y. 1970).

[25] *TWM Mfg. Corp., v. Dura Corp.*, 789 F. 2d 895 (Fed. Cir. 1986).

[26] Mueller, *supra* note 1, at 5.

[27] Id. at 6.

evaluate.

Preliminary injunctions in patent infringement cases have been developed for a long period of time in the United States. It has become an effective tool to protect patentees. When patent owners have a dispute with other parties with respect to patent infringement, prior to final judgment by the court, they can request the court to issue a preliminary injunction to prohibit patent infringers from continuing the manufacturing or production of infringing products, and even order the patent infringer to recall all the outstanding products in the market. The preliminary injunction may be the most striking remedy wielded by contemporary courts.[28]

Once the court issues the preliminary injunction, the influences of the preliminary injunction include not only the infringer being unable to successfully produce the goods and sell them to customers, but also damaging public goodwill toward the infringer, which causes the company to have difficulty doing business in the future. All of these are negative losses. Moreover, neither the court nor the litigation parties are able to obtain all of the information to judge the losses; the litigant itself can only, based on its own situation, estimate the influence of the injunction. The value of a preliminary injunction to patentee and patent infringer is influenced by many factors, including the timing of obtaining the preliminary injunction, the development plans of both parties (such as royalty or market share enlargement), the used circumstance of patent, the marketing situation of using the patent in products, and the ability for marketing development, such as whether the patentee can absorb the infringer's original market share. Under many situations, the preliminary injunction's menace to enterprises is greater than compensatory damages.

D. Transaction Cost

The transaction cost is the time and energy needed in a business transaction. The transaction cost includes the various resources of consults and the costs of performing the contract, including the cost of collecting the information about persons with whom to trade and determining trading strategies, the cost and time of negotiation, and the cost of performing the negotiated result after finishing a business transaction. Whether each transaction can make a profit and how much profit each transaction can make are related to the transaction cost. The obstacle to making a profit will be higher when transaction cost is higher.

Basically, the purpose of property law is promoting private consult. Therefore, the design of property law should exclude obstacles to private

[28] John Leubsdorf, *The Standard for Preliminary Injunctions*, 91 HARV. L. REV. 525 (1978).

consult and reduce the damages of failed private consults.[29] From the perspective of economics, the obstacles to private consult are a kind of transaction cost. The initial property right is defined to one party, and the final property right should stay with the original party when transaction cost is too high to proceed with private consult. In other words, how to effectively utilize resources depends on the law and how to determine the ownership of property rights. Under the situation of no transaction costs, no matter which party the initial law defines the property right to originally, resources will flow to the party which values the resource highest under voluntary trading. On the other hand, under the situation of transaction cost, the property right will still flow to the party which values the resource highest if the transaction cost is not high enough to hold back the business transaction. Persons in the transaction cost situation will certainly get lower net benefit than in the no transaction cost situation because transaction cost will decrease the transaction net benefit.

A high transaction cost will hold back the market and obstruct the free flow of right, but a low transaction cost will make the market work more effectively. That is to say, if the market is unable to distribute the legal right effectively, legislators should legislate to reduce transactions cost in order to encourage efficient private trade which involves legal right exchange. Because of the uncertain characteristics of patent right, the law makes it difficult to award patent rights to the party which finds them most valuable. In addition, how people look at the value of patents is constantly evolving. Therefore, the design of the law should reduce the transaction cost of patent right litigation in order to fully protect patents in society.

1.Transaction Cost of Patent Litigation

Generally speaking, the transaction cost of patent litigation includes economic costs and opportunity costs. Economic costs can be divided into necessary costs, such as lawyers' expenses, litigation expenses, and other costs. To the patentee, other costs include the patent application cost, the patent maintenance cost, and the expenses to prove the other party has infringed. To the patent infringer, other costs usually include the expenditure on products to avoid infringing, possible business loss, or required discount by customers. Even when the result of the judgment is in favor of the patent infringer, the above costs will not disappear, and it is difficult to give proof to transfer to the patentee. Opportunity costs refer to the specific time and resources which are put into litigation, and that cause a party to be unable to move those resources to fund other endeavors, such as research and development or business activities.

[29] ROBERT B. COOTER, JR., LAW AND ECONOMICS 290-95 (5th ed. 2011).

When a patent infringer gets involved in patent litigation, unless the infringer has confidence that the product did not infringe, the first consideration is whether the product needs to avoid an infringing design because designing the product to avoid infringement is time consuming. For example, IC products generally take more than one year to evaluate, design, and verify a product, and including authenticating with customers. That is to say, the patent infringer needs to reserve more than one year of job time before judgment. On the other side, the court always issues the preliminary injunction if the judgment is unfavorable to the patent infringer and prohibits the infringed product from continuing to be sold on the market. Because of the uncertain results of litigation, the patent infringer affects not only the potential public goodwill, but also causes the customer who may order the product from other companies to verify the source or require a discount. This can seriously affect a company, especially a newly developing one, because the initial order will bring income to the company and accumulate experience to earn the customer's trust and continue using the product.

2. The Economic Cost in Transaction Cost

The economic cost in transaction cost is positively related to litigation time. For example, lawyers' expenses are calculated and charged based on the amount of dealt time. Other costs of the patentee, including the patent application, maintenance cost (renewal fees) and the expenses of proving an infringed product, will increase slowly following the time of the litigation. However, for other costs of the patent infringer, the expenditure of designing products to avoid infringement holds a high percentage in initial gradation of the litigation, while possible business loss or demanded discounts may become serious following litigation.

According to the above analysis, both parties' transaction costs will increase during litigation. As this process moves forward, the infringer can foresee that transaction costs will rise; therefore, the infringer is motivated to settle the dispute at the onset of litigation. On the other hand, the patent infringer cannot gather the information related to the patentee and the judgment of the court; therefore, if the patent infringer believes that the patentee has a lower percentage chance to win the litigation, the infringer will not compromise with the patentee. In later periods of litigation, even before the judgment, both parties will have a close evaluative percentage of winning the litigation, and then the both parties will reduce their percentage of wishing to continue with litigation.

III. An Economic Analysis of the Law of Preliminary Injunction

When legal rights are infringed, the court often makes decisions to determine what the most efficient relief system is based on degree of

cooperation among the parties. When the party participants were uncooperative, then the court will grant compensatory damages directly. When the participators of the parties intend to cooperation, then the court will issue preliminary injunction to the patentee. The parties of litigation are usually not too many, and they are in a competitive relationship and known to each other. From an economics standpoint, filing a motion for preliminary injunction is an efficient method.

A. Motivation for Preliminary Injunction

The patentee's purpose in filing for patent litigation can be divided into two types. The first type of purpose is to obtain the royalty. Such situations usually happen for patentees who own the patent right, but have already faded out of the market or who own the patent but do not manufacture and use the patent itself. In this situation,, the ends which the patentee cares about are royalties and compensatory damages. To file a motion for preliminary injunction is a means to this end. The other purpose is to strengthen a business market, in which a patentee uses a patent right to attack a competitors' development or even to exclude them from the market. In this situation, the patent holder does not care about compensatory damages but rather cares about filing a motion for preliminary injunction. However, preliminary injunction is the most preferred remedy method by both patentee and patent infringer because it can exclude relative behavior in the future. The preliminary injunction, especially, has a prompt character which can immediately exclude the patent infringer's relative behavior and cause obvious and immediate pressure.

The above paragraphs explain that the patentee filed the patent litigation, which is a general situation to seek the final remedy. Because the product which is involved in patent litigation has a short product lifespan, the preliminary injunction is one of the manners of remedy which the patentee utilizes in order to keep the time effect and to reduce the affects of an uncertain legal relationship to both parties of litigation and public interest. However, the preliminary injunction is only one part of patent litigation. When both litigators face the relief of injunction, they are also evaluating based on the whole litigation. In other words, both litigators use and respond to injunction relief based on the influence of the whole litigation. For example, the patentee will still intend to file for preliminary injunction even if the patentee evaluates that the infringer's infringing act will not cause unavoidable injury in the future. It is low cost and high probability of award because it will pressure the infringer's business and negatively impact their public goodwill.

B. The Foundation of Economic Analysis of Preliminary Injunction

The foundation of economic analysis of preliminary injunction is that the judge considers various uncertainty factors, then the judgment reduces the expectation of damage and employs the idea of risk management to appropriately distribute the burden.[30]

The patentee's damage expectation of preliminary injunction is the patentee's loss and decreased profits if the patentee fails to obtain a preliminary injunction (Dp) multiplied by the courts assessment of the patentee's likelihood of success in litigation (Pj). The patent infringer's loss and decreased profits are considered if the court enforces a preliminary injunction on the infringer (Dd), which is then multiplied by the infringer's damage expectation of preliminary injunction, based on the court's assessment of the infringer's likelihood of success in this case (1 - Pj). The court should issue preliminary injunction to the patentee if the patentee's damage expectation of preliminary injunction is greater than the patent infringer's damage expectation. On the contrary, the court should not issue a preliminary injunction to patentee.[31] The formula for issuing a preliminary injunction is as follows:

$$Pj \times Dp > (1 - Pj) \times Dd \quad \text{(Formula Two)}$$

From the viewpoint of the court, deciding whether to issue a preliminary injunction is based on initial gradation of litigation and limit information. Therefore, according to purpose of balance, the court will agree to issue a preliminary injunction when the patentee's expectation of damage (Pj x Dp) is obviously greater than the patent infringer's expectation of damage ((1 - Pj) x Dd).

C. The Foundation in Economic Analysis of Involved Litigation

From the viewpoint of involved litigation, the time at which the patentee files a motion for preliminary injunction will influence both parties' attitude and will to compromise during the decision process. Certain conditions of patent litigation that continue the process and add to the consideration for preliminary injunction, as can be shown as follows:

$$Pp \times (Dp + Ip') - (Cp + Tp) > Pd \times (Dd + Id') + (Cd + Td)$$

[30] Douglas Lichtman, *Uncertainty and the Standard for Preliminary Relief*, 70 U. Chi. L. Rev. 197 (2003).

[31] *American Hospital Supply Co. v. Hospital Products Ltd.*, 780 F.2d 589, 593 (7th Cir. 1986) (where Judge Richard Posner stated that "the injunction should issue "only if the harm to the plaintiff if the injunction is denied, multiplied by the probability that the denial would be an error… exceeds that harm to the defendant if the injunction is granted, multiplied by the probability that granting the injunction would be an error.").

(Formula Three)

Ip'=Pi x Kp + Ip ; Id'=Pi x Kd + Id (Formula Four)

Pi is the patentee's likelihood of obtaining preliminary injunction, Kp is the patentee's additional benefit due to issued preliminary injunction (Negative benefit), Kd is patent infringer's loss due to the patentee being issued a preliminary injunction (Negative loss). After the operation process, Formula Three is as follows:

(Pp x Dp – Pd x Dd) + (Pp x Ip' – Pd x Id') > (Cp + Cd) + (Tp + Td) (Formula Five)

Thus, (Pp x Dp – Pd x Dd) is the misunderstanding between patentee's expectation of compensatory damages and patent infringer's expectation during the litigation. That also means a misunderstanding between patentee's expectation of compensatory damages and patent infringer's expectation. If the misunderstanding in expectation is greater, then likelihood of proceeding to patent litigation is greater. (Pp x Ip' – Pd x Id) is the misunderstanding between patentee's expectation of benefit when issued preliminary injunction and patent infringer's expectation of loss when preliminary injunction is issued. During the preliminary injunction decision process, the patentee considers the benefit which can be obtained in litigation that is misunderstood with the patent infringer's opinion of the loss. Patentee considerations may include the potential of obtaining a large benefit from the issuing of a preliminary injunction if the misunderstanding is greater. In addition, the likelihood of the patent litigation process continuing is greater when the patent infringer's opinion of the preliminary injunction will be a small expense. (Tp + Td) + (Cp + Cd) is the sum of transaction cost among patentee and patent infringer, and if it is higher, then likelihood of continued patent litigation is lower.

D. The Foundation of the Court in Economic Analysis of Patent litigation

(Pp x Dp – Pd x Dd) represents the misunderstanding of expectation of compensatory damages between patentee and patent infringer due to the issued preliminary injunction process involved litigation which includes the discovery process and Markman Hearing. In addition, the judge will explain the claim of patent right and determine whether the product is infringed. Therefore, both parties will further understand the opposite party's related information and judge's judgment. However, those factors will cause the patentee and patent infringer to expect the patentee's likelihood of success to

come into balance. In essence, Pp and Pd move toward equality. Therefore, a formula can be created to calculate compensatory damages from the judge's formula of calculation bonds and further understand Dp and Dd. On the other hand, the information from the discovery process will make patentee and patent infringer expect patentee's compensatory damages to balance; Dp and Dd move toward equality. Therefore, (Pp x Dp – Pd x Dd) is the court issued preliminary injunction process will reduce misunderstanding expectation of compensation between patentee and patent infringer.

E. The Foundation of the Involved Parties in Economic Analysis of Patent Litigation

(Pp x Ip' – Pd x Id') is the misunderstanding between the patentee's expectation of benefit from obtaining a preliminary injunction and the patent infringer's expected expense. The discussion of Pp and Pd is the same as above. Ip and Id can refer formula forth. (Kp) is the benefit amount the patentee can obtain when being issued preliminary injunction, and can become royalty as a bargaining counter. (Kd) represents the patent infringer's additional cost due to the patentee being issued a preliminary injunction, placing pressure on the patent infringer. Due to counter bonds not being able to be offered to dismiss the preliminary injunction, the influence is obvious when the patentee is issued a preliminary injunction. In patent litigation, the (Cp + Cd) + (Tp + Td) is the sum of the patentee and patent infringer's transaction costs when filing the motion for preliminary injunction, and litigation will increase both parties' costs, which include lawyer expenses, relative expense of litigation, and opportunity cost of bonds.

If the above analysis is correct, one of the factors considers the presence of irreparable injury, which is harm not quantifiable or remediable as money damages. For the factor to be satisfied, it must be determined that damages associated with ongoing infringement are economically incalculable. As a result of this inconsistency, there has been significant uncertainty among litigants regarding the likelihood of injunction following a finding of infringement.

IV. Proposal of Suggestions about Issuing Preliminary Injunction

A. Stand on the View of Transaction

In this regard, it is also necessary to be clear about what valuation standard appropriate for preliminary injunction. Based on the above scenario analysis, it appears consistency may be improved and uncertainty reduced by focusing instead on economically appropriate market indicators of forward-looking damage quantifiability. The court should stand on the view of transaction to solve the dispute of patent rights, and then the patent right can reach the most efficient circulate and practical application. Giving patent

right as an example, the patentee may apply for a patent to make use of this technology to produce at the beginning but cancel this plan after obtaining the patent. This patent is worth less for the original patentee, but this patent right is more important for other manufacturers who plan to make use of this technology. If instituting or executing the legal system causes the patent right's transaction cost to become unreasonable, this patent right will unable to be utilized to its greatest benefit.

One of the purposes of the law is to solve the problem in distributing rights among the parties. The question of distributing rights is always relative. This is especially apparent in the civil litigation case. Patent litigation provides us with many examples of this, except for disputes such as antiquarian patent medicines. Therefore, the judgment of judicial practice in particular stresses patentee's right and profits. Furthermore, patent rights are set up by the government to encourage innovations and patent right, and the government will consider the situation of industry development.

The ways of utilizing legislation to promote the rights includes distributing the legal right to the people who think the right is the most valuable at the beginning and reducing cost to promote private trade in the future. In theory, the dispute of this right will be reduced if distributing the legal right to the people who thinks the right is the most valuable at the beginning. But the patent right cannot be clearly defined as a general proprietary. In addition, the judiciary is unable to receive all information to judge whose right is the most valuable; therefore, it is hard to distribute the patent right to the person who thinks the right is the most valuable at the beginning, and it only can be determined by granting patent rights based on justice of procedure. Additionally, the value of right to everyone will change by different time and circumstance.

B. Reconstruct Market

The courts judge the patentee's lost profits is market reconstruction which is clarification of the availability of the acceptable non-infringing alternatives, benchmark methodology in the context of price erosion damages and elasticity of demand. The Federal Circuit clearly determines that it may accept parties' calculation methods and apply them on a case-by-case basis.[32]

A patent litigation case should adopt economics theories (market power, law of demand) which are beneficial to more accurately calculate patentee's profit lost and reasonable royalty. The court adopts the calculated formula of

[32] *Rite-Hite Corp.*, 56 F.3d at 1538 ("If there are other ways to show that the infringement in fact caused the patentee's lost profits, there is no reason why another test should not be acceptable").

economics (accounting) which is also addressed by both parties of litigation. Scholars use the economics model to examine related problems about lost profits and reasonable royalty. More than that, they use the viewpoint of economics to discuss idle patent, complementary goods, and limited competition. To calculate the compensation for damages in patent infringement litigation, the court should consider the factors of market economy and then really reflect the condition of market. The courts calculating the patentee's lost profits and reasonable royalty through the economics theories can show its profundity and variety, not only calculating complicated accounting voucher. Therefore, the patentee's damages can be completely displayed and give the consideration to the purpose of legislating patent law and policy.

C. Consider other Factors and Facts

Some preliminary injunction cases take into account some factors other than the four requirements established by the Federal Circuit, such as scale of business of parties, market condition, etc. For example, in *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*,[33] the Federal Circuit reversed the lower court's decision denying plaintiff's motion for a preliminary injunction in a patent infringement action related to two patents for microfiche jackets.[34] The court held that the district court erred as a matter of law in its construction of the patent claims and in concluding that the decline in the market for the patented products was a factor favoring denial of the preliminary injunction.[35] The district court abused its discretion by relying on extrinsic evidence, in the form of expert testimony, in its claim construction analysis because the available intrinsic evidence--the claims, specifications, and file history--was not ambiguous.[36] The district court, therefore, determined the likelihood of infringement based on an incorrect claim construction.

Furthermore, the lower court took into consideration the relative scale of business in making its decision. The patentee has a large scale of business while the alleged patent infringer's business scale was relatively small. The lower court considered the hardship to the alleged patent infringer should the preliminary injunction be granted, that is, the patent infringer would not be able to sustain its business because of its small scale of operation; therefore, the lower court denied the issuance of a preliminary injunction. However, the Federal Circuit reversed this decision as well. The lower court should not

[33] *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys*., 132 F.3d 701(Fed. Cir. 1997).
[34] *Id.*
[35] *Id.* at 704.
[36] *Id.*

deny the motion for preliminary injunction only because the defendant might suffer great harm due to its small scale of business. Even though the Federal Circuit recognizes the relative scale of business as one of the factors to be taken into account in making the decision, this factor cannot negate the fact that the defendant did infringe the patent right of the plaintiff. This ruling makes sense because otherwise the court will encourage business of small scale to infringe large companies' patent rights.

D. The Same and Clear Standard of Judgment

In the above discussion, the cognitive differences between patentee and patent infringer are always the most obvious in the initial stages of litigation, and then the cognitive differences between each other will be closer with the litigation. Although the factors as discussed above are different and hard to predict, but everyone's view is absolutely influenced by the court's opinion. As long as the court holds the same and clear standard of judgment, both parties can reach consensus through forecasting. After all, each party's purpose in entering patent litigation is not a quest for truth, but the utilization of a commercial tactic that just so happens to fall under the court's jurisdiction.

Thus, the parties will attempt to construct a result that both sides can accept when the right conflicts among the parties, and this can be regarded as a progress of transaction. The parties may appeal to judicial judgment when transaction consultation cannot reached by common consensus. The purpose of the court judging the right conflict among the parties is to solve the problem of the rights distribution among the parties. Any judgment reached by the courts during the trial process will appear with changing to a form of the transaction cost and further influence the transaction process and result.

The transaction cannot be completed until each side realizes a benefit. Because of this, the main reason that parties continue to dispute is differing calculations of transaction costs. Therefore, the transactions result from conflict between parties' rights. From the court's point of view, the court should work to reduce transaction costs during the trial process. The methods that the court can use to reduce the transaction cost are both parties can reasonably estimate their necessary cost during the litigation process and the court makes both parties reach common consensus and advance the transaction result.

E. Striking a Balance between Protecting the Patent and Fair Competition

As a practical matter, if the monetary compensation can remedy all the harms suffered by the alleged patent infringer without considering whether the infringer might suffer some damages which cannot be compensated by

monetary compensation, such as damage to goodwill or competitive status in the market, strict and fair evaluation of the different elements to the patent infringement cases is necessary.

If the evaluation turns out to be over-protective to the patentee, the preliminary injunction may become a "legal" weapon against competitors. However, because it takes a long time to litigate a patent infringement case, the existence of preliminary injunctions is still needed. The system should aim to balance the interest between the patentee and third parties, to avoid the abuse of preliminary injunctions and hinder fair competition.[37]

After the Federal Circuit was set up, it integrated the used-to-be similar but inconsistent opinions, and created a sophisticated system of evaluating whether to issue preliminary injunctions. That is, the patentee must introduce sufficient evidence to prove the likelihood of winning the lawsuit, and any hardship the patentee will suffer from the failure to obtain a preliminary injunction. After the courts evaluate the hardship to both parties and take into consideration any special reasons that might influence the public interest, the courts will then make a judgment as to whether to issue a preliminary injunction.

V. Conclusion

The *eBay* case has without question reshaped patent litigation strategy. No longer can patent holders presume the issuance of a preliminary injunction absent extraordinary circumstances. The lower courts must now apply the traditional four-factor test which Congress had incorporated into the Patent and Copyright Statutes. Some of the factors that the court must now consider include the following economic factors: irretrievable loss of market share and key personnel, other layoffs, loss of business, loss of goodwill, and even the financial demise of a party. While the chances of a would be infringer to avoid an injunction are better if they are manufacturing but a small component of a larger system and the patent holder is not commercially exploiting the patented invention, it is still dangerous for a would be patent infringer to categorically assume that a preliminary injunction has no chance of issuing in view of the four-factor test. The *eBay* case makes it more difficult, but not impossible, for such patent holders to obtain injunctive relief.

The preliminary injunction can be regarded as a double-edged sword in protecting the interest of the patentee. If the requirements for obtaining a preliminary injunction are too difficult to meet, the interest of the patentee cannot be fully protected. On the other hand, if the requirements are too easy to meet, that is, the standard is too loose, the preliminary injunction may be

[37] *See Nutrition 21 v. United States*, 930 F.2d 867 (Fed. Cir. 1991).

abused by the patentee because of its strong function. Worse yet, it may be used for attacking other competitors, which will seriously influence fair competition. Accordingly, it takes thorough consideration to come up with the required elements in issuing the preliminary injunction in patent infringement cases, and the required elements ought to be fairly applied to all such cases. Most important of all, courts should balance the interest of the patentee and the alleged patent infringer in making the decision of whether to issue a preliminary injunction in the patent infringement cases, in order to accomplish true fairness and fully utilize the function of a preliminary injunction.

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