

# Study of Technical Scope Including Doctrine of Equivalent and Patent Infringement Litigation

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## Abstract:

*The author classified inventions into physical-object inventions, by focusing on the appearance such as the shape, structure, etc. of the object, and material inventions, by focusing on characteristics of the object; and analyzed the formation process of an invention, regarding principles as important.*

*In this article, in the proceedings from inventions to obtaining patents, arising from technology, the following issues will be explained, focusing on principles and their utilization, common to all.*

*Based on the interaction among requirements in the theory of the method dividing content of an invention into its elements, the way of dealing with the problems such as relative weight, and the differences in construction between the patent law (law establishing rights) and the civil law (law adjusting rights), the author considers the construction of the technical scope (a claim) of a patent invention and the burden of proof in a patent infringement litigation. In such a consideration, the author also explains the requirements for the application of the doctrine of equivalent in each country.*

*It seems that such arguments explained in this article have not been made so far in the world.*

**Keywords:** Patent invention, Technical scope (Claim), Theory of the method dividing the content of an invention into its elements, Patent infringement litigation, Doctrine of equivalent.

## Introduction

In this paper, Author categorizes inventions into physical-object inventions and material inventions, as Author presented earlier (this categorization shall be hereinafter called “Opinion 1”). The author also considers a formation process of an invention (serious consideration of principle: This study shall be hereinafter called “Opinion 2”. Opinions 1 and 2 together are called “the Opinion”). Based on such categorization and study, Author then analyzes the process that “(b) an invention arising from (a) technologies is finally being granted (c) a patent,” focusing on the principles and their ways of utilization. Based on the solution of problems in a theory of dividing an invention into elements, Author elaborates on the interpretation of a technical scope, in particular, including the doctrine of equivalent, and further the burden of proof for the procedures of patent infringement litigation, based on a structural and procedural viewpoint.

The author suggested that principles and their utilization should be focused also in determining inventive step or nonobviousness for a patent requirement (Determining Inventive Step or Nonobviousness for a Patent Requirement in view of the Formation Process of an Invention, Vol.7, No.3 Beijing Law Review 238 (2016)<sup>1</sup>).

Because the above-mentioned article and this article are related to the establishment of rights and its execution, it may be understood easier if these are read collectively.

## 1. Meaning, Categorization and Formation process of an Invention, and Scope of Patent Claim

Author has already discussed issues relating to the captioned items in my earlier papers and writing (See, for example, pages 8 and 9). For the convenience of readers, however, Author would like to summarize them before going into the substance of this paper because they are the starting point of it.

### (1.1) Meaning of an Invention

#### (1) Definition of invention

The Japanese Patent Act, Article 2, Paragraph 1, defines an invention as

<sup>1</sup> Kotaro Kageyama, *Determining Inventive Step or Nonobviousness for a Patent Requirement in view of the Formation Process of an Invention*, Vol.7, No.3 Beijing Law Review 238 (2016).

“the highly advanced creation of technical ideas utilizing the laws of nature.”

[a]

[b]

[c]

(d<sub>1</sub>)(d<sub>2</sub>)

[d]

In the above, the laws of nature are natural laws, most typically principles of physics and chemistry.

The underlined terms [b], [c] and [d] imply acts. The term [c] is a kind of mental act. Thus, an invention is an achievement of acts.

Included in the term [d], (d<sub>1</sub>) is an act (subjective), whereas (d<sub>2</sub>) is an object of the act (fact/objective).

The term [a] indicates that an invention should be advanced compared to a “device” under the Japanese Utility Model Act (Article 2, Paragraph 1). However, it is not matter to be reviewed in this article.

The Opinion focuses on, in the above, the term (d<sub>2</sub>) as the principle, because the principle is the essence of an invention and an objective fact.

## (2) Laws of nature (principle)

For the “principle,” a tentative one shall suffice here. Its scope shall be interpreted flexibly and the level of the principle only needs to be very basic; for example, the basics of high school (at about 15 or 16 years old) physics and chemistry would suffice (or the degree of level is basically such that necessary understanding can be obtained by studying, as needed, starting from the knowledge of that level). The term “common technical knowledge” used in practice implies an accumulated knowledge of commonly known “principles and ways of their utilization.”

Common technical knowledge is determined from the point of sight (technical level) of “a person ordinarily skilled in the art,” in more detail, a person who has an ordinary knowledge in a technical field to which the invention belongs. Generally, a technical level of a person skilled in the invention and ability to understand the above-mentioned principle (or science) are different in viewpoints of analytical approaches and thus not contradictory.

Needless to say, it includes a combination of laws of different kinds.

The term “laws of nature” is not commonly used in daily life. However, it is a legal norm described in the patent law. Therefore, appropriate interpretation has to be made before it is applied to an actual case.

In a case of an invention by experiments, showing reproducible phenomena including experimental conditions and products having an effect will be sufficient in place of showing relevant principles.

The same thing about the principles can be said about the reproducible phenomena.

Even if a principle is difficult to understand at the time of patent application, a patent may be granted to the application with proof of its reproducible phenomenon. In such case, however, an interpretation of the scope of the patent claim may be effectively performed using principles which have been revealed until an infringement question is raised.

## (1.2) Categorization of an Invention (Opinion 1)

### (1) Physical-object invention and material invention

An invention can be categorized into either a physical-object invention or a material invention. This categorization is performed based on the viewpoint judging from the way how it looks like, so to speak, the appearance or property of an invention.

A physical-object invention is an invention that focuses on the shape, physical structure, and the combination of articles, such as circuits (its appearances). A material invention (invention for substance) is an invention that focuses on the properties of an article (including its transformation) that are used in the invention.<sup>2</sup>

In the case of a physical-object invention, it is easy to perceive its principle or model from its appearance and so on, and the principle is often easy to understand. Therefore, it is typically easy to apply the formation process of an invention ((1.3) Opinion2). On the other hand, for a material invention, its principle is often unknown or difficult to identify, and in many cases, the invention is achieved through experiments.

### (2) Examples

① As an example, we consider a case of a very simple technology as shown in Figure 1 (Appendix). To

<sup>2</sup> A Japanese Lawyer, Jun Takahashi, stated: “As for the method of categorization of inventions, it is more appropriate to use the criteria of physical-object and material inventions as pointed out by Kageyama.” (Jun Takahashi, Shokumu-hatsumeiki-kitei Henkō-oyobi Sōtō-rieki-kettei-no Hōritsu-jitsumu 51 (Keizai Sangyō Chōsa-kai 2014)).

support the force applied in the direction of the arrow, (i) if the existing technology does not provide sufficient strength to support the force, one may come up with two new ways; (ii) to increase the strength of the material used for the support, or (iii) to distribute the force load by adding a leg portion to the opposite side where the force is applied.

The support in (ii) is made of an alloy (new material) that has increased strength than ordinary steel. In (iii), the load from the force is distributed using a support which is either a combination of the mount and a leg portion or a device with a shape as shown in (iii). Here, (ii) is a material invention and (iii) is a physical-object invention.

- ② Inventions in the mechanical fields and construction fields are often physical-object ones, whereas those in the chemistry fields are material inventions. In the electric fields, for instance, (i) inventions related to circuits and so on are physical-object inventions, whereas (ii) those that focus on the properties, such as semi-conductors and magnetic materials can be considered as material inventions. The invention of the airplane described below can be considered basically as a physical-object invention in the mechanical field. Some inventions are combinations of physical-object and material inventions.

### (1.3) Formation Process of an Invention (Opinion 2)

Using an example of inventing an airplane (if the term “airplane” did not exist, it would be something like “an apparatus to carry people for flying in the sky”), we can consider as Table 1 (Appendix) shows.

In Table 1, [1] is a preliminary stage of [2]; each stage in [2] carries some recognizable originality (creativity).

What is most important in the process above is the “establishment of the model” ([2](B)(i)) for embodying the conception and the “conception based on a principle” ([2](A)(ii)) for proposing the conception. The reasons for this are as follows: By the way, inventors are those who have contributed to either of the above.

- (1) The establishment of the model and the conception based on a principle are important from a technical perspective.

In this regard, W. Brian Arthur, who is a distinguished scholar of complexity economics, wrote in his book as follows:

“At the heart of invention lies the act of ... seeing a suitable principle that will do the job... Sometimes this principle emerges naturally,... But in most cases, it arrives by conscious deliberation...”<sup>3</sup>

- (2) From the definition of an invention given earlier, the following can be considered:

As an invention is defined to be the creation of technical ideas, it is beyond question that the establishment of the model is most important in a patented invention, and the conception based on a principle is also important because an invention is a technical idea utilizing the laws of nature.

It will be clear from the above that the analysis of a principle and its use is unavoidably important for a review of an invention (or technology) as well as the structure of an invention (model).

### (1.4) Rationality of Opinion

- (1) The viewpoint of the Opinion and that for looking at the society

- ① It is considered that the reasonable method to clarify the content of an invention would be to analyze and examine it from (a) the looks (appearances, properties) of the invention, which is cognizable by human beings and (b) the process by which an invention is formed because a human being is involved in its production. The aforementioned (a) is the viewpoint suggested in Opinion 1, and the aforementioned (b) is the viewpoint suggested in Opinion 2. This can be illustrated conceptually as indicated in Figure 2 (Appendix).

- ② The above viewpoint is considered to be in line with that of looking at the essence (future and so on) of the society.

Looking at this in terms of the correspondence with the above ①, when people think of the present society (“the current state”), they watch, for example, the international situations, the domestic and international economic situations, the school enrollment rate and the divorce rate. What corresponds to

<sup>3</sup> W. Brian Arthur, *The Nature of Technology: What It Is and How It Evolves* 121 (Penguin Books 2009).

the “formation process” is the history. We look at the future by putting the current state and the history together. This can be illustrated conceptually as indicated in Figure 3 (Appendix).

One thing that can be said for both ① and ② above is that a viewpoint such as the Opinion is considered reasonable for investigating an invention.

## (2) Resolving patent-related issues by the Opinion

The Opinion suggests additional views from technological and natural-scientific aspects for examining patent-related issues, which had been conventionally examined from social-scientific views only. Further, as mentioned in (1)①, they are reasonable viewpoints to examine the content of inventions from the looks (appearances and properties) in which the invention appears and the process by which the invention is formed.

Based on the Opinion, Author has written several papers on issues such as; (a) recognition of inventor/joint inventors and calculating contribution ratio of joint inventors<sup>4</sup>, (b) product-by-process (PBP) claims<sup>5</sup>, and (c) criteria for determining the inventive step<sup>6</sup>. In this paper, (d) the issue of a technical scope is discussed. As regards to the issues of (a) and (b) above, Author has written a book in English: “Recognition of Inventor/Joint Inventors and Product-by-Process Claims.”<sup>7</sup>

### (1.5) Scope of Patent Claim

A scope of a patent claim is led out by putting the model in order from the viewpoints of technology and right. A principle of an invention is not usually specifically mentioned. A scope of a patent claim is an aggregate of the creation of technical ideas. The patent claim shows a technical scope and a scope of an exclusive right and protection.

In the example given in (1.3) earlier on inventing the airplane, the scope of patent claims for this invention can be given as follows.

An apparatus for flying comprising an airframe for letting a person on; and devices attached to the airframe, which are including,

- a propeller for getting forward the airframe,
- a driving source for rotating the propeller,
- and wings for producing a lift force required to float the airframe with a person on board against an air resistance produced when promoted by means of the propeller.

A technical scope shall have to be interpreted, considering a principle and its way of utilization in an invention.

## 2. Analysis of Technology, Invention, and Grant of Patent based on the Consideration of a Principle and its Way of Utilization.

The law regulates a right and duty. A right is granted to human beings by law. Whether it is justifiable for him/her to obtain the right or not is determined based on his/her act. The history of a patent starts, as seen in Figure 4, from technology (A) based on which an invention (B) is made. A patent (C) is granted to the invention. When the invention is patented, the patent is ready for exploitation and enforcement (D) as a proprietary right.

In Figure 4 (Appendix), step C is a stage for granting a right to an invention as a legal system. In particular, at the step C<sub>2</sub>, conditions for granting a patent are specified. The patent act includes provisions for the step C<sub>2</sub> in connection with acts relating to an invention. However, with regard to a meaning of an “act”

<sup>4</sup> Kotaro Kageyama, *Formation of Invention/Joint Invention and Recognition of Invention/Joint Inventor*, Vol.5, No.10 Journal of Intellectual Property Law and Practice, Oxford Journals 699 (2010); Kotaro Kageyama, *The Practice of Recognizing an Inventor/Joint Inventors and the Calculation of Contribution Ratios among Joint Inventors*, Vol.7, No.8 Journal of Intellectual Property Law and Practice, Oxford Journals 590 (2012).

<sup>5</sup> Kotaro Kageyama, *Necessity, Criteria (Requirements of Limits) and Acknowledgement of Product Identity of Claims for Product Described by Its Manufacturing Process Product-by-Process Claims*, Vol.5, No.2 Beijing Law Review 114 (2014).

<sup>6</sup> See footnote 1.

<sup>7</sup> Kotaro Kageyama, *Recognition of Inventor/Joint Inventors and Product-by-Process Claims* (LAP LAMBERT Academic Publishing 2015).

(subjectivity), it is appropriate to analyze an “object” (objectivity) of the “act.” Such analysis will help understand the meaning of an “act” more clearly. While an “act” can be regarded as, so to speak, entrance and an exit, an “object” is dealt with inside between them. An object of an inventive act is a principle and its way of utilization. It shall be desirable to describe an exit as an “act” with an appropriately summarized description (for example, p. 33).

For this reason, it is reasonable to analyze facts and rights as an “object” of an “act”, but not an “act”, based on a principle and its way of utilization commonly found in each step of A, B, C ( $C_1$ ,  $C_2$ ,  $C_3$ ) and D. This analysis will help focus on an “object” more clearly and determine the differences and similarities of multiple “objects” as well as the degree of their differences and similarities (quantitatively). In addition, by focusing on a principle and its use, professional knowledge on relevant technologies would be utilized. Furthermore, such knowledge should be utilized. To begin with, the patent act is in a field of law which requires technical knowledge. In this regard, a statutory determiner is sometimes a person ordinarily skilled in the invention. (Article 29, Paragraph 2 and Article 36, Paragraph 4, Item 1 clarify this situation.)

Among the components of the step  $C_2$ , an inventive step is a test to examine whether “an invention is easily made” (Patent Act, Article 29, Paragraph 2), that is, an invention act is easily conceived. In practice, however, examined is a motivation or suggestion of an inventive act from conventional technologies. So, the statutory requirement tends to be unclear as criteria. This is the reason why a conclusion on this point is variable depending on examiners. This fact encourages the use of criteria of “differences of a principle and in its use.” To the contrary, with regard to an interpretation of the technical scope ( $C_3$ ) which is an established norm the object to be reviewed becomes clearer.

### **3. Differences and Commonalities of Principle and its Ways of Utilization**

In comparing technologies, it seems likely that difference is getting larger in the order of factors listed in the following Subsections (3.2) and (3.3) (more specifically from (3.2)(1)(2) to (3.3)(1)(2)).

For more details, see the paper on inventive steps in which a principle and its use comes out more directly. The paper is cited in footnote 5.

#### **(3.1) Viewpoints Observing a Principle and its Ways of Utilization to be Analyzed**

In the following Subsections (3.2) and (3.3), a discussion is made for clarity with regard to a physical-object invention (technology), where there are no qualitative changes in an inventive product by the principle and its use.

In analyzing a principle and its ways of utilization, the viewpoint to analyze can be different depending on the purpose to be required. In a case of multiple combinations of principles and their ways of utilization, a point of emphasis may be different depending on the difference of the viewpoint (purposes), such as what principle for what way of use. For example, in cases discussed in paragraphs (10.2) (1) and (2), two approaches are available for analysis; (a) only an inventive product is reviewed in view of a principle and its use, or (b) a principle and its use approach are applied for the comparison of an inventive product and an object product (an allegedly infringing product, otherwise, a prior art in the case of inventive step).

#### **(3.2) Principle Itself**

(1) Principle

(2) Number of principles, combination of principles

(3) Level of the principle (broader/subordinate concept)

Any principle differs in the level of its detailed content. For example, Figure 5 (Appendix) shows different levels of principles.

(4) Another aspect of using the same principle - in case where they can be considered functionally different principles

For example, an electrical resistor functions as a resistor when a current flows in it. This principle is used as a heater in a heating device. As shown in Figure 6 (Appendix), however, the same principle is used as a resistor in a load tester to examine the performance of a power generator or dynamo.

#### **(3.3) Utilization of a Principle**

(1) Relations with the field of industry and technology

The relationship between the field of industry/ technology and the principle used in those can be

generally and categorically illustrated in Figure 7 (Appendix).

In Figure 7, the part is shown by the double line (==) is supposed to have a close relationship between the principle and the field of industry/technology. For example, at point A, it is easy to assume that the chemical principles are used in the chemical industry. However, at point B, it is harder to foresee that dynamical principles are used in the medical and pharmaceutical industry.

## (2) Utilization to positively enhance effects and to passively reduce effects

- ① A “sprayer” uses Bernoulli’s theorem (principle) in our daily life. When a horizontal pipe of the sprayer is blown, the air at the top end of the vertical pipe is blown off to cause a fast velocity of air, where pressure is low. Water rises up in the pipe to be blown off as mist.

Bernoulli’s theorem can be used for two directions as discussed below (a) to use negative pressure and (b) to reduce it. By the way, in everyday life, we feel positive pressure but do not feel negative pressure easily. When we are near the fast velocity in a large scale, negative pressure becomes powerful. The technical utilization of negative pressure can be called an effective use of a principle which is hard to sense. Interestingly, the conception to use such a principle is supposed to be part of the essence to produce an invention.

### (i) Shape of the wing of airplanes

Referring to Figure 8<sup>8</sup> (Appendix), the cross-sectional view of a wing of an airplane shows a round shape on the top compared to its bottom. With this shape, air flows faster, and pressure reduces on the round top, thereby to cause lift. To enhance the force of lift, the wing shape has been improved. In this case, the problem to be solved is caused by the technical request. This is an example of using negative pressure.

See Table 1 also, with reference to the invention of the airplane.

### (ii) Shape of the back of vehicles

When a vehicle moves forward, air pressure is applied to the front of the vehicle, and negative pressure is caused along with its back, which causes energy to hinder the vehicle to move forward as indicated in Figure 9.2 (Appendix). To solve this problem for economic reasons, a design of the back shape of the vehicle has been refined, as shown in Figure 9.1 (Appendix). This is a case where negative pressure is reduced.

- ② In the case where an electrical resistor is used in a load tester, heat is generated due to the Joule’s law when a current flows in the electrical resistor.

An electric heater positively utilizes Joule’s law. However, in a load tester, heat generation is not preferable as it causes the tester overheated and sometimes spoils a stability of its resistance value. Therefore, an improvement is made to release heat outside with reference to the structure of the apparatus or to cool it down using a fan.

Thus, it may be possible to understand that a load tester passively utilizes Joule’s law in the way offsetting the effect of heat generation.

## (3) Difference in substances and materials which cause principles (give function)

## (4) Difference in the object body to which principles are applied

Bernoulli’s theorem, for example, is applicable not only to gases but also to liquids. When it is used for liquids, a resultant invention can be thought of as a different invention from one using gas as indicated in Figure 10 (Appendix).

Velocity is calculated from the difference of pressure at the hole A (positive/negative pressure) and the hole B (only positive).

## 4. Structure of the Patent Act with regard to Grant and Enforcement of a Right

### (4.1) Japanese Patent Law

Figure 11 (Appendix) depicts a concept of the framework of the Japanese Patent Law.

Under the patent law, a right is established as an administrative act by the government (so-called, the establishment of rights). Thus, the patent law has a face of administrative law. However, the enforcement of a right is performed in the relation between private persons, and the patent law has special provisions derived from the Civil Code used in the above relation (so-called, the adjustment of rights) (for more details,

<sup>8</sup> Airplanes. How do airplanes fly?, <http://www.explainthatstuff.com/howplaneswork.html>. (last visited Nov. 19. 2016).

see (7.1)). Unlike other countries, the demand for the compensation for damages in itself has no statutory basis on the patent law in Japan. It is subject to the provision of the Civil Law.

#### **(4.2) Patent Laws in Germany, the U.S.A., and the U.K.**

The following summarizes the essence of the patent laws in three countries, comparing features with the Japanese Patent Law.

##### **(1) German Patent Law**

The Japanese Patent Act was enacted in 1899 and overhauled entirely in 1921. The patent act modeled out of the German Patent Law.

The Japanese law is basically in line with the continental law system, and the Civil Code is also influenced by the German law. The framework in German Patent Law of how a patent right is granted and enforced is fundamentally the same as that summarized in Subsection (4.1). However, the German Patent Act regulates less special provisions derived from the German Civil Code than the Japanese Patent Act does.

Simply stated, when an infringement is found in patent infringement litigation in Germany, the court shall order an injunction of infringement and order the infringing party to submit a calculation in relation to the infringement acts. The patent holder, on the other hand, shall claim a payment of damages based on the calculation information submitted by the infringer, which surrenders the profits obtained by the infringer. Theoretically, the patent holder shall be obliged to file a separate litigation when an agreement has not been concluded between the parties. In practice, however, it is said that a settlement is commonly made. To the contrary, in Japan, the amount of an infringer's profit is presumed as that of damages suffered by the patent holder. This is stipulated in the patent act as a presumption of damages, which is derived from the special provisions of the Civil Code of Japan as discussed in paragraph(7.1)(1).

In Germany, the establishment of a right and the determination of its validity are administrative acts performed by the government. The interpretation and application of a right are strictly segregated as acts of a private person. In patent infringement litigation, therefore, the court does not decide that a patent at issue is invalid. In that instance, a party in the litigation shall be required to file a separate litigation for patent invalidity. In Japan, the former patent system was similar to the above and the court did not decide on patent validity. A validity issue was exclusively handled by the Japan Patent Office as a trial for invalidation. However, the former system was renovated in 2005, and since then, a party in patent infringement litigation has been allowed to claim a defense of a patent invalidity (However, the effect of the decision is only between the parties). This change was made aiming at a one-shot resolution of disputes.

##### **(2) Patent law in the U.S.A.**

The Japanese Patent Act had an influence of the U.S. Patent Law, especially after the World War II. The doctrine of equivalent is a representative example of the U.S. influence. The U.S. law follows a common law system which differs from the system in Japan. A relationship between private persons is regulated under common law, such as customs law and case law. Although the U.S. Patent Law regulates the establishment of a right, it also sets a norm to regulate private persons. Good examples are provisions for indirect infringement (see (7.1)(1)) and triple damages in the case of intentional infringement (note: triple damages have no counterpart in Japan). In view of the abusive use of injunction claims in the past, the present U.S. law is more restrictive to injunction claim than the Japanese law.

In patent litigation, the defendant is allowed to raise a defense of patent invalidity.

##### **(3) Patent law in the U.K.**

The U.K. is a "common law" country. The patent law in the U.K. regulates the establishment of a right. A relationship between private persons is subject to common law.

As seen from the above, the patent law systems in the above countries seem to attain functionally similar effects with regard to the establishment and enforcement of a right. However, the Japanese Patent Law as a substantive law seems to be arranged because it includes the clearest separation between an establishment side (establishing rights under the patent act) and an enforcement side (adjustment law under parts of the Civil Code and the patent act), and it includes the most special provisions derived from the Civil Code. Once a patent right is established, its exclusivity is effective against third parties. The adjustment of rights stays within a relationship between the parties. Therefore, the establishing law should not be interpreted under the thought of the adjustment law. The rationale for it is explained in detail in Section 7.

## **5. A Theory of Dividing an Invention into Elements**

This Section discusses a theory of dividing an invention into elements, which is popularly used as a simple yet convenient method for analyzing the structure of an invention and a technology questioned in the patent law.

### **(5.1) Meaning, Problems and Countermeasures of the Theory**

#### **(1) Meaning and its case of application**

An invention and/or technical matter comprise several elements which are described in written form. Thus, by dividing an invention into elements, (a) identification of a specific technology becomes easy. When multiple technologies are compared, (b) the structure of those technologies are divided into elements, and then it will be able to compare each corresponding element, which in turn helps facilitate a comparison of the entire technologies.<sup>9</sup>

#### **(2) Problems**

In applying this approach of dividing an invention into elements, however, two things have to be kept in mind.

##### **① Be aware of the interaction between each element**

In a physical-object invention, there are no interactions to cause a transformation of substances between each element. This is because the physical-object invention is due to a shape, physical structure or a combination of articles. Each element is considered to have been merely placed in parallel. In this case, a principle and its use are considered to be the total of each principle and its use supporting each element, which can be foreseen from the outer appearance.

In a material invention, however, it is considered that one element is influenced (operated) by other elements and a nature of the object of the element is transformed. The same thing can be said about a principle and its use. There is an interaction between principles and their use in each element, and a new principle and its use can be born under interactions, although it is not in each element. Therefore, an entirety of principles and their uses is not clear from the only outer appearance of each element.

In case (a), where a structure of an object technology is partly different from that of an invention, or case (b), where a structure of an object technology has an additional part to that of an invention, it is likely that the difference or addition may provide new functions to the other parts of the object technology. Such functions are considered to have been obtained by the new principle and its use.

In a material invention, in particular, it is not enough to formally compare elements to understand whether a technology is different from or similar to another technology. It is necessary to substantially look into the existence and/or extent of a new function (principle and its use to show such function) to be caused by a different element or element to be added.

##### **② Be aware of the difference in the significance of elements**

In principle, a scope of patent claim has to describe not only matters indispensable for a structure of an invention but also other matters which are necessary to identify an invention (Patent Act, Article 36, Paragraph 5). However, each element is different in its significance. Significance can be caused by factors such as (a) whether an element itself is known or new; (b) whether a principle and its use in an element is main or not, in the entire function of an invention; and (c) extent of characteristics to the function/effect of the element or an entire invention by a principle or its use in an element. This will also give a quantitative influence to the difference or commonality of a claim as a whole.

#### **(3) Measures**

The problems discussed above were caused because the theory to divide an invention into elements is, so to speak, a formal and literal analytical approach. To address such problems, the following approaches are suggested. First, in the case where we observe the structure of an invention or technology, we grasp its entirety, that is, if it is a physical-object or material, or which part is for the former and which part for the latter. Next, although the following can be applied in a physical-object invention, especially with regard to the material invention or the material part of it, we should consider a principle and its use between or behind elements. Thus, we can make a substantial and deepened analysis of an invention.<sup>10</sup>

<sup>9</sup> There are different approaches for a division of an invention into elements. A good example is whether to divide "A" into "A<sub>1</sub>" and "A<sub>2</sub>". However, by way of grasping a principle and its way of utilization in each element, a technology can be appropriately identified and a comparison between multiple technologies can be made.

<sup>10</sup> In case where a principle is unclear from an entire invention, a reproducible phenomenon is used instead of it. Even in that



The theory of dividing an invention into elements is a fundamental approach to analyzing the structure of an invention or technology. With adjustments discussed above, the theory would help an analysis to be more persuasive when it is applied to many problems under the patent law.

## (5.2) Review of Examples

Here, an assumption is made that the structure of an invention comprises A+B+C (the elements are A, B, and C).

(1) A case of an object technology being of A+B+C+D

① An element D is added to an object technology. If the object technology uses the structure of the invention (A+B+C) "as it is," it shall be considered to cause an infringement because it uses other person's patent invention. (Refer to Section 11)

On the other hand, if in the case of a material object technology, the element D causes functional effects for all elements of A, B, and C, or some of them, it cannot be concluded that the object technology uses other person's patent invention "as it is." This assumes that a different principle and its use can be recognized without the element D.

Therefore, the object technology does not cause an infringement.

Like this, interactions among elements have to be considered.

② It is said commonly that the notion of A+B+X is different from the notion of A+B+C. Likewise, a notion of A+B+C+D is often regarded as being different from the notion of A+B+C. Legally speaking, the former notion (A+B+X) does not fall within the scope of rights of the notion (A+B+C). However, the latter notion (A+B+C+D) is likely to cause an infringement question in some cases. Like this, legal effects are quite different. Therefore, due to attention should be paid to the risk of legal liability.

(2) A case of an object technology being A+B+C.'

In this case, a difference between the element C and the element C' is supposed to be a factor  $\alpha$ . A question of whether an object technology of A+B+C' falls within the technical scope of the invention of A+B+C depends on, simply stated, on the importance of the factor  $\alpha$  (whether the element C and the element C' are sufficiently important). For example, depending on the degree of variations of a principle and its use to be shown by the factor  $\alpha$ , a question of whether to establish the doctrine of equivalent or not shall be addressed. If a variation is small, the doctrine of equivalent may be justified. (For more details, see Section 10.)

As discussed in item (5.1)(2)②, a key issue in an analysis of an inventive step can be whether an element in question is known or new.

## 6. Identification of an Invention (Gist), Patentability Requirements and Technical Scope

### (6.1) Gist, Patentability (its Requirements) and Technical Scope

When an invention is completed, an object for which a patent applicant seeks is a gist of an invention. Examiner shall examine whether his/her invention meets the patentability requirements (namely, novelty, inventive step, and so on). When Examiner finds that the patentability requirements have been met, a patent is granted to the invention. A breadth and strength of a patent, when it is enforced, is decided by the technical scope.

Therefore, a gist of an invention and a technical scope have to be along with each other basically. This will endorse an interpretation of its technical scope (or claim interpretation) to be the same with recognition of the gist of an invention.

### (6.2) Differences between the Gist of an Invention and its Technical Scope

This problem is considered from two aspects; a structural aspect and an adjusting aspect.

(1) Structural aspect: the case of PBP claims

According to a case law, it is permissible to identify a product by process claims (PBP claim) when the product is impossible or extremely impractical (or criterion of impossibility/impracticability) to identify with its structure or characteristics. In such case, if it becomes clear at an enforcement phase that the criterion of impossibility/impracticability has not been met, a technical scope should be interpreted in accordance with "Process Limitation Theory" as the product is limited to a process described in the claims. However, at the phase of an invalidation trial or defense of patent invalidity, "Identical Product Theory" may be applied.

case, a principle and its use are available for some elements or between elements, which should be used effectively.

This theory extends to the same substances to those manufactured through a process described in the claim. This is because the identical product theory is applicable to a product examined and patented.

Simply saying, this implies that if an original gist of an invention was mistaken, the gist, as well as its technical scope, had to be amended accordingly. However, in this case, patentability has to be determined based on the original gist of an invention. If the criterion of impossibility/impracticability has not been met to a large extent, then, the patent at issue should be determined to be invalid.

In this case, the gist of an invention covers a larger scope than the technical scope.

In the Opinion, PBP claims are available, only when an identification of a product is inevitably impossible due to its structure or characteristics according to the formation process of the invention (criterion for admitting PBP claims). Enforcement is possible only when identification based on the temporary principle is made for the structure or characteristics. For more details, see the reference cited in footnote 3 and Author's book cited on p. 8.

(2) Adjusting aspect: In the case of necessity of practical adjustment at the phase of enforcement

In view of the limitations due to systemic constraints as well as time constraints, a patent is sometimes reviewed during an enforcement phase.

There are two cases for such review: a narrow interpretation of a technical scope in view of stability of rights and a broad interpretation of a technical scope in view of the equity of rights.

① Possibility of narrower interpretation of a technical scope than a gist

A good example is a reference to an examination history.

When an applicant has intentionally excluded certain matters during an examination, the applicant is barred to reclaim such excluded matters at the interpretation of its technical scope. This is commonly called a file-wrapper estoppel.

To be more specific, when an application narrowly amends patent claims in response to reasons for rejection and so on, from an examiner during an examination, the applicant shall not be allowed to argue later that the portion which was given up is still recoverable under the claim.

In Author's view, however, this limitation should not be weighed excessively because it requires more than disclosure in the patent gazette and is against the stability of rights. In actuality, however, an alleged infringer often requests for an extension of time, to be called "investigating an examination history" in a patent infringement dispute.

A reference to an examination history is frequently made in Japan. However, there is no such practice in Germany<sup>11</sup>. In the U.S.A., it is not used so naturally as in Japan in a literal infringement case.<sup>12</sup>

② Possibility of broader interpretation of a technical scope than a gist

A good example is a case to which the doctrine of equivalent is applied.

In a case decided by the Tokyo District Court on October 7, 1998,<sup>13</sup> the court mentioned on "equivalency" as follows:

"Even if a structure described in the patent claim of a patent invention and the structure of the object product (the allegedly infringing product) which corresponds to the invention are partly different in the non-essential portion of the invention, the corresponding part shall be appreciated substantially the same to fall within the technical scope of the invention, so far as [1] the corresponding part functions for the same purpose to obtain the same technical effect with a substantially same technology, and [2] a person ordinarily skilled in the art can easily construe that the use of the structure in the product at issue will assure to achieve the same effect."<sup>14</sup>

The court stated that "this interpretation resides on the substance of the law which offsets inequities arising from the formal application of law."

<sup>11</sup> Shōseki Nishishita, *Ōshu-niokeru Kurēmu Kaishaku – EPC69jō Giteisho-tono Kankei Doitsu-hen* (2012), The Japan Patent Attorney Association, International Activity Center, Foreign Information, European Information, Germany, available at [http://www.jpaa.or.jp/about\\_us/organization/affiliation/kokusai/gaikokujouhou/report/europe/de/pdf/ClaimInterpretation.pdf](http://www.jpaa.or.jp/about_us/organization/affiliation/kokusai/gaikokujouhou/report/europe/de/pdf/ClaimInterpretation.pdf). (last visited Nov. 1, 2016).

<sup>12</sup> Toshiaki Iimura, *Sobu-30shūnen-kinen-kōen Dai-Ikai Hatsumei-no Yōshi-no Nintei-to Gijutsu-teki-han-i-no Kaishaku, sarani Kintō-ron-no Katsuyō (First Commemorative Lecture of 30<sup>th</sup> Anniversary of Division Founding: Role of Claim Construction and Doctrine of Equivalents in Patent Infringement and Invalidation Trial)*, Vol.64, No.11 Patent 57, 65 (2011).

<sup>13</sup> K.K. Kōken v. Tatsumi Ryōki K.K., 1657 Hanrei Jihō 122; 987 Hanrei Times 255 (Tokyo D. Ct., Oct. 7, 1998).

<sup>14</sup> There are examples in U.S. cases where alleged infringers were decided not infringing, even though literal infringements seem to have been established on appearance, by way of reverse doctrine of equivalents. This paper shall not discuss it further.

With regard to the doctrine of equivalent, a discussion shall be made in detail in Section 10.

The doctrine of equivalent and the doctrine of estoppel, which is established by reference to the examination history, may show an opposite interpretation on a technical scope. In both cases, it shall be appropriate to interpret a technical scope either flexibly or strictly.

In Germany, for example, both cases are interpreted strictly, whereas they are interpreted broadly in the U.S.A.

## 7. Patent Act and Civil Code

In Section 4, Author discussed the establishment and enforcement of patent rights under the patent laws in Japan, Germany, the U.S.A. and the U.K. and concluded that a framework is basically the same in these countries. Here, Author would like to discuss the interpretation of a technical scope at the phase of patent infringement litigation from the fundamental viewpoint of the relation of application of the patent law and the Civil Code. The patent law presents a view of special law and an establishing law, whereas the Civil Code presents general law and adjusting laws. As mentioned before, in Author's view, the Japanese Patent Law clearly distinguishes the establishing law from the adjustment law, and it includes a number of provisions derived from the Civil Code and it is arranged well. The author makes discussions below based on the Japanese Patent Law. The discussion here shall be also applicable to the law of other countries above.

### (7.1) Relationship between Patent Law and Civil Code

#### (1) General Law v. Special Law

Patent infringement is a kind of illegal acts under the Civil Code. For the purpose of reasonable operation of the patent system, the patent law only regulates illegal acts in its special provisions, while leaving the other general provisions of the Civil Code.

For example, the following provisions are regulated by the patent law, though they are not admitted in illegal acts under the Civil Code (law of obligations or personal rights).

- a) A claim for injunction of an infringing act for the purpose of increasing hampering effect against infringement (Patent Act, Article 100);
- b) Finding assignment of an article which is used only for infringement purpose as an indirect infringement (Patent Act, Article 101);
- c) Damages amount shall be presumed because injury by infringement is grave and its proof is difficult (Patent Act, Article 102);
- d) Negligence shall be presumed by which proof of injury by infringement can be proven without difficulty (Patent Act, Article 103).

As item a) above shows a concept close to the real right, the patent right is often called a quasi-real right or intangible property right.

#### (2) Patent Act as an establishing law and Civil Code as an adjustment law.

- ① An applicant files a patent application to the Patent Office to obtain a patent grant after examination. Conducts through this process are to establish a right to the application and can be understood as administrative conducts. A right obtained through this process is a property right and has a binding effect on everyone in the society. This paper calls the patent law as an "establishing law" from this viewpoint.

An important thing here is that a patent claim is a kind of legal norm established by the country. To be a legal norm, it is published in an official gazette (patent gazette) for disclosure to third parties. A patent right can be understood as a quasi-real right or intangible property right. A patent claim should clarify the structure of an invention even if the content is intangible. In principle, the outer boundary of a right is defined by the written language of claims.

This kind of a right is granted as a reward for the disclosure of an invention to the public. It is considered as a policy that a provision of a monopoly to an inventor for a limited period of time may be justified because an early disclosure of a patented invention would promote an invention and be useful for the development of technologies and the society.

For a patent holder, his/her patent claim regulates a scope of rights and a scope of protection. At the phase of patent infringement, however, the application of a patent claim is subject to private law.

Once a patent infringement is questioned, the patent act cannot be excluded. In this meaning, the patent act functions as a compulsory statute.

- ② To the contrary, the Civil Code is a basic private law to adjust the rights and interests of private persons or parties. There are a lot of arbitrary provisions which can be exempted from an application under the will of the parties, particularly in the law of obligations. This is one of the reasons why the Civil Code is important as a guideline for the adjustment of rights and interests among private persons. In this respect, the Civil Code is called an “adjustment law” in this paper.
- ③ Finally, a first thing to do is to interpret a patent claim as a basis for a right under the establishing law. Then, application of the claim shall be interpreted as an adjustment law. This relation of interpretation and the application must not be confused.

### **(7.2) Interpretation of Patent Claims**

(1) A patent right provides its inventor with a monopoly of the invented technology for a limited period of time. A patent claim describes it as a legal norm. Within the scope of a patent claim, the third party’s freedom of act is restricted. Therefore, the interpretation of a patent claim has to be precisely made basically literally. Otherwise, a stability of law would be uncertain against the interest of a third party who contemplates designing around the patent right.

As a result, matters only described in the claim fall within the scope of rights and those not described in the claim do not. The content of the patent right has to be proven by the patent holder to whom a right was established especially under the patent act.

(2) First, according to a formal rationale, in the case where an element is not described in a claim wording, that is, for example, an element D in an allegedly infringing product of A+B+C+D when claim is A+B+C, the interpretation that “the addition of the element D is not excluded because there is no description” does not be allowed. (For more details, see paragraph (9.1)(2) below.) The interpretation that the product of A+B+C+D is included within the right of the invention of A+B+C must not be allowed.

To the contrary, under adjustment laws including the Civil Code, it is impossible to regulate guidelines for everything relating to the parties. Usually, it suffices if reasonable adjustment is made taking into account the will of the parties. Under the Civil Code, therefore, a contrary interpretation that “the element D is not excluded because there is no description” may be available.

(3) Then, turning to contents, a patent claim specifically represents a content with inventive concepts. Therefore, technical matters claim shows and principle and its way of use supporting them have to be scrutinized as much as possible. An approach under the adjustment law in the preceding paragraph (2) shall not be taken as an easy formal way of interpretation.

### **(7.3) Burden of Proof for Enforcement**

The enforcement of a patent right hinders the freedom of activities of other persons. Therefore, the interpretation of a patent claim, which is a basis for its own right, has to follow the discussion in Subsection (7.2). A burden of proof to show the structure of the product of an alleged infringer, and for it to fall within the patent claim and to cause infringement (suspected infringing person), belongs to the patent holder.

However, litigation is a system to be proceeded reasonably by the parties. Against arguments and proof by the patent holder, an alleged infringer may be required to counter-argue and counter-prove to a limited extent (prima facie counter-arguments and counter-proof). (See paragraph (9.2)(2))

## **8. Procedures of Patent Infringement Litigation and Burden of Proof**

Desirable procedures for arguments and proof with evidence by the patent holder (plaintiff) and the alleged infringer (defendant) shall be as follows.

### **(1) A hypothetical case**

Structure of a patent invention: A+B+C

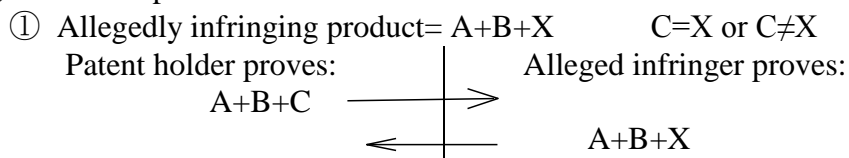
Structure of an allegedly infringing product:

(a) A+B+X. Whether C and X are identical : next (2)①

(b) A+B+C’. Doctrine of equivalent: next (2)②(See Section 9)

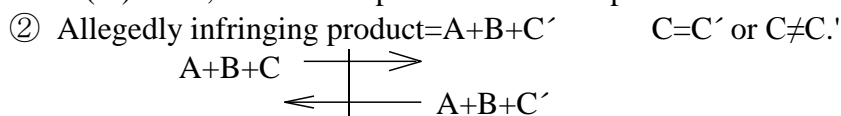
(c) A+B+C+D. Relation to use other person’s patent invention:next(2)③(See Section 10)

(2) Burden of proof



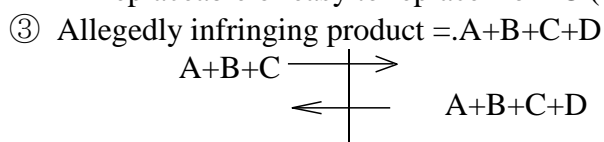
<Steps>

- (i) The patent holder has a burden of argumentation and proof.
- (ii) The alleged infringer proves a *prima facie* proof of  $X \neq C$ . For example, it proves that a principle and its use in the element X are different from those in the element C, therefore that its function/effect is different.
- (iii) Then, a burden of proof shifts to the patent holder who is supposed to prove  $X=C$ .

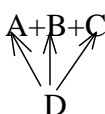


<Steps>

- (i) The alleged infringer proves  $C' \neq C$  with a *prima facie* evidence, (focusing on the difference of its principle and use).
- (ii) Then, a burden of proof shifts to the patent holder who is supposed to prove that C' is replaceable or easy to replace from C (namely, identical principle and use).



a) A point of issue is as follows: whether it is A+B+C+D, or D interacts with either A, B and C or all of them, i.e., it is



This often happens in a material invention.

<Steps>

- (i) The patent holder argues that the allegedly infringing product meets the elements of an invention.
- (ii) The alleged infringer argues with a *prima facie* evidence that a new function/effect has been caused by an addition of D due to a new principle and its use.
- (iii) Then, the patent holder has to prove that the effect of the element D is scarce.

Because a patent right is a right established under the establishing law, a rationale such as “Patent right does not exclude D from its scope” (See paragraph (9.1)(2)) under the adjustment law, is not available.

b) If the structure of the allegedly infringing product is A+B+C+D and that of invention A+B+C is “used as is” in the allegedly infringing product, it shall fall within a technical scope of the invention. They are in relation to use other person’s patent invention.

**9. Court Decision of Patent Infringement**

**(9.1) Tokyo District Court Decision (2014/7/10)<sup>15</sup>**

The case was argued on a patent relating to a method for production of a product as a material invention. The issue was similar to that discussed in item 8 (2)③a).

**(1) Case**

- ① Patent invention (JP No.4274630) is summarized as follows:
  - A: Neutralizing the electrolytic manganese with sodium compound or potassium compound;
  - B: adding lithium materials;
  - C: adding a chemical compound containing aluminum, magnesium, calcium, titanium, vanadium,

<sup>15</sup> Chiteki Zaisan Ssaibanreishū, Japanese Supreme Court website, [http://www.courts.go.jp/app/hanrei\\_jp/search7](http://www.courts.go.jp/app/hanrei_jp/search7).

chromium, iron, cobalt, nickel, copper, or zinc to said electrolytic manganese dioxide, so that a part of manganese is replaced with at least one or more selected elements of said chemical compound;

D: and mixing and burning the commixture of them;

E: a method for producing spinel-type lithium manganate

- ② In the allegedly infringing process, with respect to the element C, an aluminum compound, and boric acid are added to replace a part of manganese with aluminum and boron, respectively.

Arguments were made whether the alleged process in which boric acid was added to materials falls within the technical scope of the patent invention.

## (2) Court decision

- ① “Based on the description of the scope of the claims for the patent invention, the requirement is that a certain ratio of manganese is replaced with the elements listed in the claim such as aluminum. With respect to the case where this requirement has been met, it is inappropriate to construe that an additional replacement of other parts of manganese with an unlisted element is excluded.”
- ② “In the specification, there is no description to suggest an exclusion of use or addition of an unlisted element as being undesirable. Therefore, taking the description of the specification into account, there is no description that supports the interpretation that the addition of the unlisted element, besides the listed element, to replace a part of manganese on mixing with the materials, causes the process to fall outside the technical scope of the patent invention”.
- ③ The court concluded that “since the description of the scope of the patent claims does not literally exclude the addition of other substances than the listed elements such as aluminum, existence of a step for addition of boric acid does not turn over a finding that the element D have been met”, and that “even if (the added product is) a composite oxide containing a boron, it does not negate the fact that the element E were met.”

With these findings, the alleged process was found to fall within the technical scope of the patent invention.

## (9.2) Review of Decision

(1) In the foregoing item (9.1)(1)②, there is not the underlined portion (~~~~) in the structure of a patent invention. It interacts with the element D and the content of D changes from the invention. Naturally, its function/effect is different from the invention. Thus, it is necessary to review the function/effect of boric acid to determine whether the allegedly infringing process falls within the technical scope of the patent invention.

(2) In this case, the defendant argues with a *prima facie* evidence that boric acid functions as a flux to fill out the gaps of the composite of materials (author’s note: the melting point of boric acid is low) and that it promotes sintering to obtain products of high particle density and quality due to smoothing a solid-phase reaction of the composite. (The defendant’s *prima facie* evidence would suffice if it shows a principle based on common general knowledge.) Then, the plaintiff has to prove that there is no difference with reference to the function/effect or that difference is negligible if any.

(3) However, there is no mention about the proof in the court decision. The court simply stated that the allegedly infringing process fell within the technical scope of the invention on formal and passive ground that “the addition of an unlisted element such as boric acid is not excluded.”

This decision follows an approach in line with the adjustment law or the Civil Code. However, with reference to the scope of a right based on the patent law establishing rights, non-literal requirements shall be necessary to prove positively that it falls within the scope of the right.

(4) As stated in item (7.1)(2)①, a patent right is a quasi-real right. With reference to the basis of a right, it should be treated as the similar thing to a real one whose elements and components should be disclosed to understand its content. Likewise, a process for production has to show at least all materials to be used. The use of boric acid as a material, therefore, has to be positively disclosed. A court’s passive reason that “boric acid is not excluded” was not sufficient.

(5) Otherwise, the interpretation that “Everything is O.K.”, as is commonly said, can be admitted and it is extremely unreasonable. Let us assume an invention of special steel in which elements A and B are added to the iron and another technology in which an element C is added to the invention. In this case, the invention shall cover a new type of special steel with the element C. The same thing could be said about the

technology with the added catalyst to a patent for a manufacturing process with use of materials A, B and C (the technology can fall within the patent).

Therefore, there is a concern that the way of interpretation the Tokyo District Court has taken may unreasonably restrict and hamper the development and progress of technologies.

(6) The court stated with respect to the description in the specification as follows. There was no description to exclude unlisted elements (boron) in the specification and this fact constitutes reasons for the court's decision. However, this reasoning follows an opposite path of thinking. It is true that no specific reference was made with relation to boron and boric acid in the specification. This is because the invention did not anticipate the use of boric acid. In embodiments, shown are examples in which materials were replaced with elements such as aluminum, magnesium, calcium, titanium, chromium, iron, cobalt, nickel, copper and zinc. However, the examples of boron were not listed.

This will lead us to believe that, contrary to the conclusion of the court, the use of a boric acid in the allegedly infringing process witnesses that it does not fall within the technical scope of the invention.

In other words, in a case where elements are specifically named or listed in the patent claim, the interpretation of the claim shall be limited to the listed elements only in principle. This interpretation is in line with the spirit of an establishing law. If attempts are made to construe elements which are listed in the claim as an example, such construction shall require appropriate grounds and explanations.

## 10. Doctrine of Equivalent

Author has already discussed an implication and a framework of the doctrine of equivalent in the foregoing item (6.2)(2)②. There are many published papers and articles which discuss the doctrine of equivalent. In this paper, therefore, Author would like to focus on requirements for the doctrine of equivalent in view of a principle and its way of utilization.

### (10.1) Requirements for the Establishment of Equivalency and Burden of Proof in Japan

#### (1) Requirements

The Japanese Supreme Court gave a decision on February 24, 1998,<sup>16</sup> as follows (parentheses, and contents and—in it at the end of each requirement are added by Author):

If the following five requirements are all satisfied, the object product (the allegedly infringing product) may be deemed equivalent to the structure described in the scope of the patent claim, and within the technical scope of the patented invention.

- <1> Even if there is the part which is different from the object product in the structure described in the scope of patent claim, the part is not an essential part of patented invention (non-essential part);
- <2> Even if the part is replaced with that of the object product, the objectives of the patent invention will be achieved, and the operation/effect of the invention will remain the same (replaceability);
- <3> Replacing as stated above could have been easily conceived at the time when such object products were manufactured (ease of replacement);
- <4> Object products are not identical to the public technology or were not easily conceived by a person ordinarily skilled in the art, at the time of the patent application (exception to public technology); and
- <5> There are no special circumstances indicating that the object product was intentionally excluded from the scope of the patent claim in the patent application procedures (estoppel in examination history).

#### (2) Burden of proof

The above-mentioned Tokyo District Court decision continued following the part cited in item (6.2)(2)② to state that a party who asserts the application of equivalency shall bear a burden of proof on facts <1> to <3> which relate to the requirement of substantial identity among the requirements described in above (1). The other party who asserts a negation of equivalency shall bear a burden of proof on facts <4> and <5> which relate to exemptions of equivalency.

### (10.2) Analysis by a Principle and its Way of Utilization with regard to the Requirements for the Establishment of Equivalency

With regard to the requirements <1> to <3> which relate to the original meaning of “equivalency,” it

<sup>16</sup> K.K. Tsubakimoto Seikō v. THK K.K., 1630 Hanrei Jihō 32; 969 Hanrei Times 105 (Sup. Ct. Feb. 24, 1998).

seems logical to understand from viewpoints of a principle and its way of utilization as follows. (Requirements <4> and <5> have policy-oriented implications.)

First, a factor  $\alpha$  is set as a point of difference in structures between a patent invention and an object good. (The factor  $\alpha$  is the same as the difference between the element C and the element C' as discussed in paragraph (5.2)(2).)

**(1) First requirement (non-essential part)**

A determination is made as to whether the factor  $\alpha$  is for an unimportant portion concerning the principle and its way of utilization in the invention. It is understood that such importance is caused by; i) whether the principle or its use which is represented by the factor  $\alpha$  is main or not, in the invention's function as a whole, ii) the extent of characteristics of the principle and its use which is represented by the factor  $\alpha$  in the function/effect of the element or an entire invention (See item (5.1)(2)②). When it indicates an unimportant part, it shall be determined as being non-essential.

The above determination is made objectively for a patent invention only.

**(2) Second requirement (replaceability)**

Comparing the patent invention with the object product, a difference in their principles and their ways of utilization shall be objectively determined with regard to the factor  $\alpha$ . When the difference is small, replaceability can be found.

Under the first requirement, the principle and its way of utilization are determined for a patent invention only (so to speak, absolutely). Under the second requirement, however, they are determined to compare the patent invention with the object product (so to speak, relatively).

In the Supreme Court's decision, the court stated that "the objectives of the patent invention will be achieved." This statement would be made in view of solving problems. However, a determination of "... will be achieved" tends to be subjective. A criterion of the "difference or commonality in principle and its way of utilization" is more objective. If the principle and its way of utilization are the same, necessarily "the function/effect of the invention will remain the same." However, as a notion of function/effect is comprehensive, the criterion of the principle and its use would show concrete and clear results.

**(3) Third requirement (ease of replacement)**

This requirement is for a determination of an act that "replacing could have been easily conceived." Whereas a determination under the first and second requirements is objective, a determination under this requirement is, so to speak, subjective.<sup>17</sup>

A criterion of "... could have been easily conceived" is for a determination based on an act. However, it is clearer that the difference or commonality of a principle and its way of utilization, which are the object of an act, is set as a criterion. The same thing can be said about a determination of easiness in conceiving the invention in the inventive step. Author has discussed this issue in detail in publications cited in footnote 5.

However, the inventive step is a requirement to be applied when a patent is newly granted. It has nature which is created under an establishing law. To the contrary, the doctrine of equivalent is raised at the phase of patent infringement litigation. It is a matter of adjustment between the patent holder and a holder of the object technology. Therefore, it seems that the replaceability in the doctrine of equivalent can be treated more flexibly than in the easiness in conceiving an invention for the inventive step, with regard to taking into account the commonality of principle and its use and so on.

Like in the case of the requirement <2>, a determination is made based on the difference or commonality of the principle and its way of utilization. If the difference is small, the object product (the allegedly infringing product) can be deemed to have been conceived easily. In other words, to what extent the requirement <3> has been met can be presumed by checking the degree of satisfaction of the requirement <2>.

**(4) Principle and its use as the object to be determined: viewpoint of their analysis**

- ① Under the third requirement, "ease of replacement," "easiness in conceiving replacement" and "whether persons would have known of the interchangeability" in the U.S. case law (in Subsection (10.3)

<sup>17</sup> In this paper, the first and second requirements are categorized as an objective determination while the first one is absolute and the second one is relative. Comparatively, the third requirement is categorized as a subjective determination. An objective determination focuses on an object (principle) in an invention so it shows a nature of fact-finding. On the other hand, a subjective determination focuses on inventive acts so it shows a nature of estimation. Comparing an "absolute" with a "relative" in an objective determination, the relative determination includes some aspects of estimation.



and so on are determined as acts of human beings.

An issue of whether an act of human being constitutes patent infringement has to be estimated in view of its purpose and result. In that occasion, however, the object of the estimation shall be the difference or commonality of a principle and its way of utilization of a technology which is their object in the allegedly infringing acts. That is because the essence of an invention is a principle and its way of utilization. On account of the above, the criterion of determination becomes clearer and objective. As discussed in the preceding paragraph (3), an interpretation and then expression that “replacing ... could have been easily conceived” can be made when the difference in the principle and its way of utilization is small. (See p.10.)

- ② Viewpoints have to be clearly presented. Otherwise, the adequate analysis may not be made for the sake of a purpose.

Under the first requirement above, the principle and its use were considered with regard to the invention itself, whereas they were considered with regard to a comparison of inventions (technologies) under the second requirement above. Like this, viewpoints of analysis are different. Even if the principle and its use are used as a benchmark, an appropriate approach should be sought to meet with its purpose. (This is one example of what was said in Subsection (3.1).)

- (5) When a determination is made.

A determination shall be made at a time when an application for a patent is filed or when the patent infringement occurred. As technology develops, a difference between both the above shows a difference in the level of technological development.

The first requirement rests on the timing when an application is filed for a patent. This is the timing that a recognition and argument of the applicant is to be acknowledged. The second and third requirements are based on the timing when infringement takes place. However, easiness in conceiving an invention increases along with the development of technologies. In this case, the fact that the first requirement is determined at the time of patent application may cause some restriction.

In Author’s view, a determination will be easier irrespective of its timing because it focuses on a principle and its way of utilization which makes the object clearer.

- (6) Procedures under the views of this paper

- ① Review of the first requirement.

This issue is important and has to be dealt with first of all.

The first requirement reviews the principle and its way of utilization in the patent invention at issue. If the review shows that they are not essential, a conclusion would be likely that replacement is easily conceived in the second and third requirements. Actually, however, failure of meeting the first requirement would negate equivalency without a further review of the second and third requirements in many cases.<sup>18</sup>

- ② Joint review of the second and third requirements

This is an essential review while more focus is put on the second requirement.

In Author’s view, the third requirement can be presumed from the second requirement. The first requirement is, however, distinctive. Therefore, as analysis is required from two aspects, it is more detailed.

<sup>18</sup> Reference is often made to a pioneer invention or epoch-making invention. A pioneer invention has a characteristic nature of; (a) a principle or its way of use in the invention has not been used so far, and (b) its utility to technology and society is enormous. Such invention should be evaluated highly in society. Nevertheless, there is a concern that the doctrine of equivalent is narrowly applied to such pioneer inventions. One of the reasons for such concern is that a non-essential portion of an invention is narrowly determined.

In Author’s view, however, such problems could be resolved as follows.

First, a question of “what is a pioneer invention” should be answered that it has a principle or its use which has not hitherto been used or scarce. Otherwise its scope might not be defined appropriately.

Next, the first requirement asks the importance of the difference between a pioneer invention and a late-coming invention in the pioneer invention itself. Therefore, it has no relation to whether the invention is a pioneer or not. However, as a pioneer invention has a principle and its use which has not existed so far (epoch-making), if the late-coming technology is similar to the pioneer invention, it seems that the difference is non-essential in practice. Then, as the late-coming technology shows the same principle and its use to the pioneer invention, it is thought that the second and the third requirements are easy to apply. Therefore, a reasonable solution can be made with regard to a pioneer invention without a special theory using the approach of difference or commonality of a principle and its use as discussed in the above Section 3 and considering the above “Next, ... to apply.”

**(10.3) The doctrine of Equivalent in the U.S.A.<sup>19</sup>**

The doctrine of equivalent in the U.S.A. had been positively employed since the 1980s when a so-called “pro-patent” policy was prevailing. Later, it has been downturned because there were increased concerns that the doctrine was abusively used to hamper free competition.

In the *Graver Tank* case, the U.S. Supreme Court has employed a criterion: whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent.<sup>20</sup> Based on the criterion, the Court elaborated on a three-part identity test (function-way-result test or FWR test to admit the equivalence). This test is to examine whether: (i) function is substantially the same; the (ii) way is substantially the same, and the (iii) result is substantially the same.

The above-mentioned test has a common basis as the similarity of a principle and its way of utilization in the theme of this paper. That is to say; it can be explained as the thing which shows a principle and its use.

Later, the Supreme Court clarified the criterion of the doctrine of equivalent in the case of *Warner Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*<sup>21</sup> In this case, the Court instructed as follows.

- (i) The Supreme Court decision in the *Graver Tank* case shall not be negated.
- (ii) All elements rule: In the analysis, comparison shall be made between claims and an object product on an element by element basis, but not their entireties.
- (iii) Examination history estoppels: Estoppel shall be applied to an amendment to narrow the scope of claims for the purpose of patentability. In this case, equivalency shall not extend to the portion deleted or abandoned by the amendment.
- (iv) The intention of an infringer is irrelevant.

In the *Festo* case (2002),<sup>22</sup> the Supreme Court affirmed that the decision of the court in *Warner Jenkinson* case should remain the same with respect to the strictness of application of examination history estoppels.

The requirements under the foregoing case law of the U.S.A. appear to be common to those established in the decision of the Japanese Supreme Court on February 24, 1998. It is said that the Japanese Supreme Court was influenced by the development of the U.S. case law.

With regard to the requirement (i) above, the three-part test corresponds to the second requirement of the Japanese Supreme Court decision in Japan and “whether persons...would have known of the interchangeability” corresponds to the third requirement. However, the counterpart to the first requirement in the Japanese Supreme Court decision is not clear. It seems appropriate to clarify it. The requirement (ii) above sets a basis for review of this. In the Japanese Supreme Court decision, stated in paragraphs (10.2)(1) and (2), two aspects are presented; the first requirement and a group of the second and third requirements. The same approaches are taken in item (10.2)(6)② of this paper. The fact that the Japanese case law shows the use of the first element is clearer than the case law of the U.S.A., and the U.K. and Germany which are discussed later.

As shown in item (6.2)(2)②, equivalency is interpreted broadly in the U.S.A. However, estoppel is also interpreted broadly.

**(10.4) Doctrine of Equivalent in Europe (U.K. and Germany)**

A patent is granted by the European Patent Office (EPO) and is enforced under such national law and regulation. A scope of protection or technical scope is interpreted in each country to assure its enforcement. However, in view of influence by a claim interpretation at an enforcement phase to a grant of patents, a uniform interpretation has been sought. With this background, the European Patent Convention (EPC),

<sup>19</sup> See regarding the application requirements of the doctrine of equivalent in the U.S.A., the U.K. and Germany, Keishi Ohno, *Tokkyo-kurēmu Kaishaku-ni-kansuru Chōsa-kennyū (Research and Study for Interpretation of Patent Claims)*, Chizaiken Kiyō 80 (2002) available at

[http://www.iip.or.jp/summary/pdf/detail01j/13\\_09.pdf](http://www.iip.or.jp/summary/pdf/detail01j/13_09.pdf); regarding the application requirements in Germany, Shimako Kato & Aya Usami, *Doitsu-niokeru Saikin-no Kurēmu-kaishaku-oyobi Kintōron-nitsuite (Recent Developments on Claim Construction and Doctrine of Equivalents in Germany)*, Vol.68, No.1 Patent 93 (2005).

<sup>20</sup> *Graver Tank & Mfg. Co. v. Linda Air Products Co.*, 339 U.S. 605 (1950).

<sup>21</sup> *Warner Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17 (1997).

<sup>22</sup> *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 (2002).

Article 69, and a “Protocol for the interpretation of the EPC, Article 69” have been agreed upon.

Under EPO’s policies for a uniform interpretation with a strong demand for the need of stable transactions among member countries, the U.K. and Germany attempt to legislate their own national frameworks. However, it seems to involve a hard work to realize uniform judgment due to the difference of judicial systems and views on the issue depending on each member country.

#### (1) United Kingdom (the U.K.)

In the case of *Improver Corporation v. Remington Consumer Product Ltd.*,<sup>23</sup> the court found the application of the doctrine of equivalent when a Catnic/Improver standard shown next is met.

- (i) The variant does not have a material effect upon the way the invention works,
- (ii) This (i.e., that the variant had no material effect) would have been obvious at the date of publication of the patent to a reader skilled in the art, and
- (iii) The reader skilled in the art nevertheless would not have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning was an essential requirement of the invention.

There is no examination history estoppel in explicit form. Afterward, there is a decision which negated the doctrine of equivalent.

When the above standard is compared to the Japanese Supreme Court decision, wordings of the requirement (i) above seem to be common with the first requirement of the Japanese Supreme Court decision. However, it seems to correspond to the second requirement. The requirement (ii) above seems to correspond to the third requirement. According to Author’s view, the requirements of the above standard can be explained as an expression of the principle and its use.

#### (2) Germany

A BGH decision in the *Formstein* case in 1986<sup>24</sup> is the first case on the doctrine of equivalent in Germany. The standing requirements for equivalence are as follows (2002)<sup>25</sup>:

- (i) Whether a problem of an invention has been solved by a measure which has an objectively same effect (same effect)
- (ii) Whether a person skilled in the art can easily conceive that a replacing measure has the same effect as an invention according to his/her professional knowledge (possibility of conception)
- (iii) Whether a person skilled in the art can recognize that a replacing measure has the same value to correspond to the meaning when he/she considers from the substantial meaning of the technical concept protected by the claim (same means for a solution based on the technical concept).

A *Formstein* defense shall be admitted by arguing that as an allegedly infringing product was known prior to the date of priority (or the date of application in Japan) by the prior art, it was able to be used.

The examination history is not taken into consideration.

The above requirements generally are regarded similar to the Catnic/Improver standard (see footnote 22). When compared with the Japanese Supreme Court decision, the requirement (i) above corresponds to the second requirement, while the requirement (ii) above corresponds to the third requirement. In Author’s view, requirements in German cases discussed above can be explained as an expression of a principle and its use.

As discussed above, they are commonly found in the requirements for equivalency in each country to the extent that a quick survey has revealed. The Japanese Supreme Court decision seems to be most well organized and easy to understand. It fits with the rationale of this paper.<sup>26</sup>

### 11、 Relation to Use Other Person’s Patented Invention in the Japanese Patent Law

It is stipulated that an owner of the patent (A) cannot implement the relevant patented invention if the patented invention utilizes a patented invention owned by someone else (B) (“Related to the patent invention by others”) (Article 72). For (A) to be able to implement the relevant patented invention, (A) needs to have a license for the patent of (B). If (A) does not have the agreement with (B), the implementation of the patented invention of (A) falls in the infringement against the patent right of (B). This relation to use another person’s

<sup>23</sup> *Improver Corporation and Others v. Remington Consumer Product Ltd. and Others* [1990] F.S.R. 181.

<sup>24</sup> BGH GRUR 1986, 803 *Formstein*.

<sup>25</sup> Katō and Usami’s paper in footnote 22.

<sup>26</sup> The draft Patent Harmonization Treaty (1990) had a provision in Section 21 that claims extend to equivalency. However, the draft treaty did not agree upon. The concept contained in the draft treaty seems to be influential to many countries, though.

patented invention is basically understood that the prior patented invention should be “used as is.”

The example of the relation to use another person’s patented invention is easy to understand in terms of a physical-object invention, whereas it is difficult to understand in terms of a material invention. For instance, in a material invention where (D) is added to (A), (B) and (C) as raw material/components, the addition of (D) will change the reactions of (A), (B) and (C). This is due to the change of properties caused by adding (D). This can be hardly considered as “using as is.” Generally, this cannot be regarded as relation to use another person’s patented invention. There are many misunderstandings even among patent practitioners with this point. However, if, for example, (D) is an effective catalyst, it is plausible that a method of production that incorporates (D) should be considered as quite a new invention. This is how the discussion regarding the relation to use another person’s patented invention, can be clarified based on Opinion 1.

## 12. Postscript

In this paper, an analysis has centered around an interpretation of a technical scope in view of a principle and its way of utilization and has been proposed.

A good example of this approach is an ease of replacement in the doctrine of equivalent. Arguments are made on this issue regarding an act, but in actual practice, the ease of replacement would be clearer and objective when it is judged based on a principle and its way of utilization as an object for acts.

Author has written a paper (see footnote 6) on the inventive step and stated that a principle and its way of utilization are clearly objective as a basis for interpretation than such an act as “whether it was easy to conceive the invention” or the motive of an act like “whether there was any suggestion or motivation”.

Both cases have a common approach that a principle and its way of utilization as the object of acts should be discussed for acts regulated by statutory law or case law.

In practice, also, it is reasonable to use the views discussed in this paper for conventional approach of act-oriented interpretation. In particular, the theory of dividing an invention into elements is a fundamental method to analyze the structure of every invention and technology. Its weakness is to be formal and superficial. Views expressed in this paper based on the Opinion may be effective when they are adopted in conventional approaches to consider to detail.

## Appendix

Figure 1. Invention of new material (material invention) and a new device (physical-object invention)

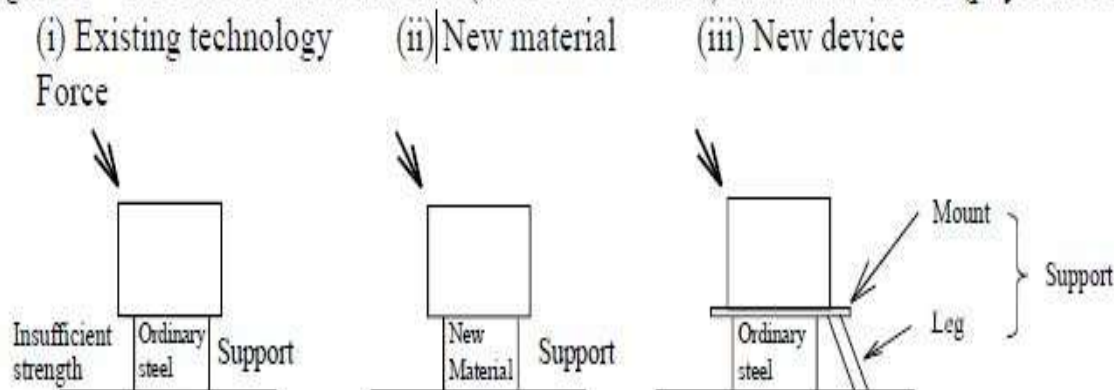


Figure 2. Viewpoint for investigating an invention

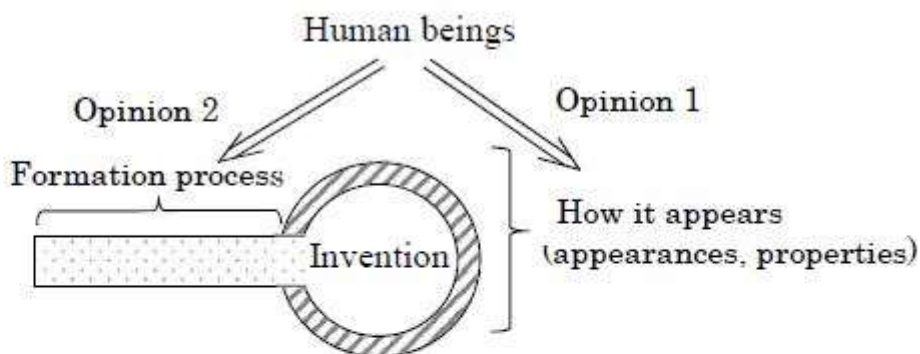


Figure 3. Viewpoint for looking at the society

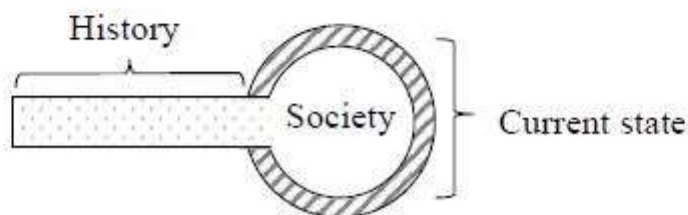


Figure 4. A principle and its way of utilization in the process of technology, invention and patenting

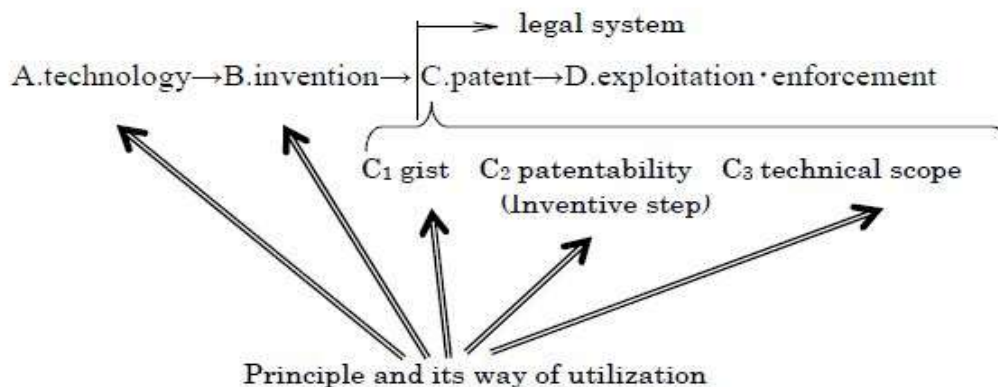


Figure 5. Examples of principle levels

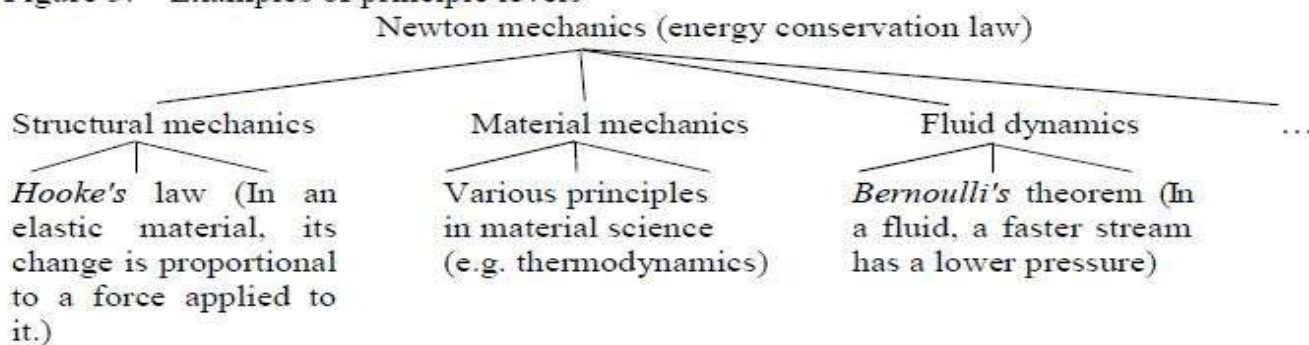


Figure 6. Load tester

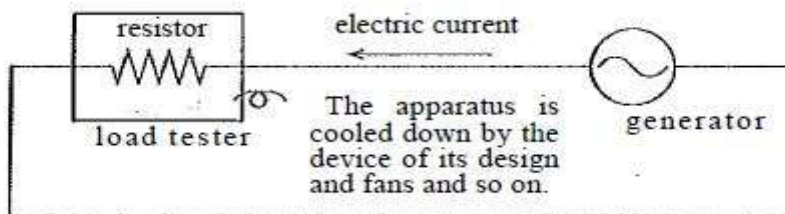


Figure 7. Relationship between the principle and the field of industry/technology

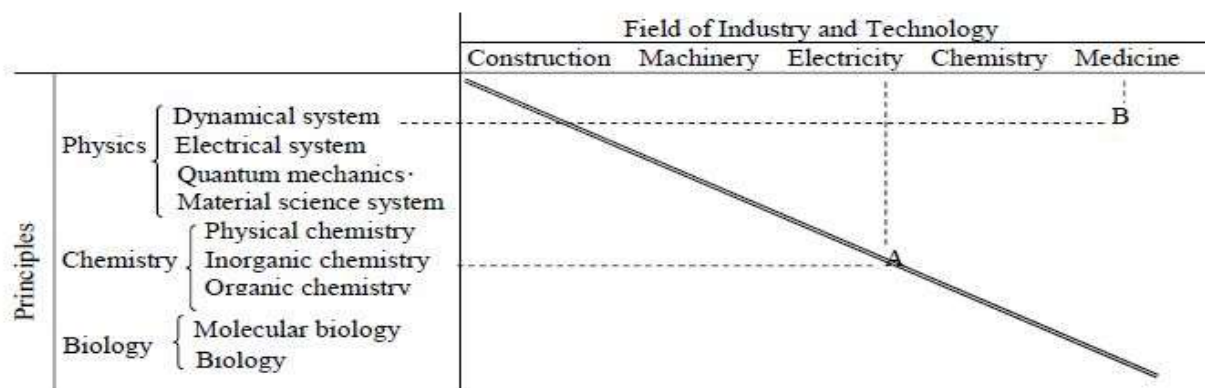


Figure 8. Shape of the wing of airplane

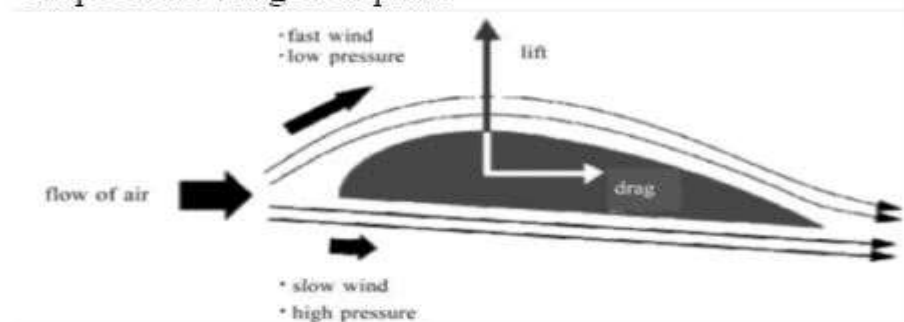


Figure 9.1. Back of the vehicle (shape with a smaller negative pressure)

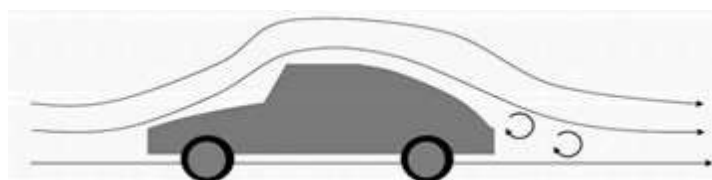


Figure 9.2. Back of the vehicle (shape with a larger negative pressure)



Figure 10. Pitot tube

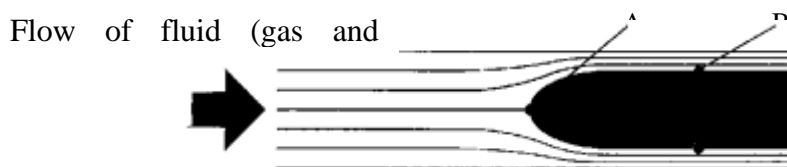


Figure 11. Framework of the patent law

	Patent Law		
	Identification(*1) (gist)	Patentability(*1) → Technical scope (*2) Establishment of a right	Enforcement of a right
nature of rights	Quasi-real right (intangible property right) Demand for injunction	special provisions of Civil Code Presumption of Negligence	Illegal act (right of obligation) Demand for the compensation for damages

Administrative law

administrative actions by Patent Office to establish a patent right.  
an establishing law for grant of right (\*3)

Civil Code

adjustment law (\*3)

(establishing a legal norm)

\*1 In an ordinary invention, matter will go to the stage of examination of patentability requirement without questioning identification. However, in a PBP claim, identification shall be a serious problem.<sup>27</sup>

\*2 When a PBP claim was granted, and it was later found that it failed to meet the requirement of “impossible/impractical circumstances” (Japanese Supreme Court), the technical scope shall be interpreted literally in accordance with the Process Limitation Theory. However, in an invalidation trial or a defense of patent invalidity, the gist of an invention shall be determined as a product in accordance with the Identical Product Theory.<sup>28</sup>

\*3 For the meaning of the establishing law and the adjustment law, see Section 7.

**Table 1.** Purpose of an invention and the formation process of an invention (the case of inventing the airplane)

[1] Purpose of an invention (the problem)	- want to make the apparatus to carry people for flying in the sky
[2] Formation process of an invention (A) Conception (proposal of <sup>*1</sup> )	
(i) Mere intuition	- make the apparatus which has the structure like a bird
(ii) Conception based on a principle	- make an object float in the air using the air resistance by propelling it forward (generate a lifting force for an object using the air resistance caused by propulsion force)
(B) Embodiment of the conception	
(i) Establishment of a model	- install a power device in an object to rotate a propeller, etc., and establish a structure having wings with a specially devised shape
(ii) Experiments, calculations <sup>*2</sup>	- conduct progressive experiments starting from (a) parts such as propellers and wings, to (b) a model of the airplane body, and proceeding to (c) a full sized airplane body - obtain necessary experiment results/experiment formulas and calculation results/calculation formulas
(iii) Adjustment of the model	
(iv) Completing by repeating (i) to (iii)	- something that is practically applicable/usable

<sup>27</sup> See footnote 5, p.121, and Author’s book cited in footnote 7.

<sup>28</sup> See paragraph (6.2)(1) on the Process Limitation Theory and the Identical Product Theory.

\*1 In the case of a joint invention, conception needs to be proposed; otherwise, it is very difficult for the other relevant parties to understand.

\*2 generally speaking, experiments and calculations are conducted considering the parts to start with and then the whole, and also starting from the models then expanding to the full-sized object. Here, calculations include computer simulations.

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