Research Paper Concerning How the Creations Made by Use of AI and 3D Printing Data Should Be Protected under Industrial Property Law

I. Purpose of This Research

The purpose of this research is to prepare basic data for further examination as to how the creations made by use of AI and 3D printing data ("3D data") should be protected. In this research, we (i) analyzed the current situation from a technical perspective and predicted future technical development, (ii) grasped the needs of users for protection provided under industrial property law, (iii) gathered information about the protection currently provided under industrial property law and about the related issues under discussion in other countries, and (iv) studied experts' opinions and arguments about legal issues, etc.

II. Contents of This Research

1. Issues concerning the creations made by use of AI from the perspective of industrial property rights

(1) AI

AI is gaining public attention as a technology that makes it possible for a machine to think like a human being. With the development of AI technology, creative activities by use of AI technology are expected to become increasingly sophisticated. In the future, based on an instruction from a human being, AI is expected to make a creation that can be regarded as an invention.

Some people predict that AI will autonomously make and execute an action plan in around 2020 and acquire humanlike capabilities in 2030. AI is expected to reach the level where AI engages in creative activities on its own.

(2) Protection for creations made by use of AI under the current law

(i) Criteria for considering a creation made by use of AI as a creation made by a natural person

A creation made by use of AI technology would be considered to be an invention made by a natural person if that person has been involved in the process of identifying a problem, selecting the possible means to solve the problem, or evaluating the feasibility. Furthermore, if a natural person conceives of an invention or reduces it to practice, the invention would be considered to have been made by that person. Further examination needs to be made to determine whether each of these criteria should be used independently or should be used together with the rest of the criteria in a comprehensive

manner.

Even if an invention made by use of AI is considered to be valuable, it cannot be protected unless the inventor is identified. If we aim to solve this problem by trying to identify the inventor, it would cause a problem of identifying somebody as the inventor even though his or her contribution to the invention is very small. Thus, these two problems should be examined simultaneously. It is necessary to continue our research on how human contribution to creations will change with the advancement of AI technology and newly establish the criteria to determine which creations should be protected and what kind of human involvement is required to receive such protection.

(ii) Ownership of the rights for creations made by use of AI

Under the current Patent Act, only a natural person can be regarded as an inventor. In principle, the inventor is identified based on the degree of his/her contribution to the creation. Therefore, in the case of an invention made by use of AI, the ownership of the rights for the invention should be determined based on the degree of contribution made by each of the natural persons for the invention.

(iii) Protection of learned models under industrial property law

In connection with the protection of creations made by use of AI, it would be meaningful to examine whether industrial property law should provide protection not only for the inventions completed as a result of the creation process, but also for the learned models produced in the process of making inventions.

In general, a learned model is considered to be a combination of an AI program and a parameter. As long as a learned model is defined as "AI program plus a parameter," in other words "program, etc.," it can be protected under industrial property law. On the other hand, if a learned model is defined merely as a parameter, it would not be regarded as "program, etc." and could not be protected under the Patent Act unless it has a certain data structure. However, some people have said that a learned model defined in such way could be regarded as "program, etc." because a learned model, even if it consists solely of data, could be considered to have a function that is useful for computer information processing.

In this way, a learned model can be defined in more than one way. Depending on which definition is adopted, the treatment of a learned model under industrial property law would change. The development of AI technology could lead to the emergence of new types of learned model. Thus, it is necessary to carefully observe the transformation of learned models and conduct further examination.

(iv) Necessity for protection for the creations made by use of AI

One of the reasons for promoting protection of creations made by use of AI is to allow people who were involved in the creation process to collect investments.

The basic idea that such protection is needed would not change considerably even though some people might argue that the appropriate amount of protection should be determined for each creation in consideration of the degree of the use of AI in the process of creation.

(3) Legal issues concerning autonomous creation by AI

According to the survey results, some respondents replied that AI will start making creations autonomously within 20 years. This suggests that autonomous creation by AI is considered to be feasible to some extent.

Under the current law, which considers that only a natural person is entitled to exercise rights, no autonomous creations by AI would be protected. As of today, there is no official record concerning a creation made autonomously by AI that deserves protection under the Patent Act. Thus, it is not necessary to urgently determine whether industrial property law should provide protection for autonomous creations by AI. So far, we do not recognize the necessity to grant rights for autonomous creations by AI. In fact, some people suggest that granting rights for such creations would cause problems.

We need to carefully observe future technical development and, at an appropriate timing, reconsider the issue of how to treat autonomous creations by AI in consideration of the needs of companies, etc.

(4) Treatment of creations made by use of AI in other countries

We examined the relevant laws and the issues under discussion in the U.S., Europe, the U.K., Germany, France, China, and South Korea.

As in Japan, in the aforementioned countries and region, a creation made by use of AI will be protected under their respective laws. Those countries and region are the same as Japan in terms of the stance that AI is not entitled to exercise rights and that no rights can be granted for autonomous creations by AI.

In those countries and region, a learned model could be protected under industrial property law as long as it is defined as "AI program plus a parameter." However, if it is defined merely as "parameter," the stances of those countries and region vary in terms of whether the learned model can be protected and which industrial property act should be applied. We need to conduct further research on AI technology and learned models in

consideration of the possibility that each country or region defines "learned model" differently.

2. Issues concerning 3D data under industrial property law

(1) 3D printing technology

"3D printing" is a method of producing a three-dimensional object. Usually, it means an additive layer manufacturing technique, which allows us not only to produce a prototype, but also to manufacture products and parts by ourselves. Thanks to the advancement of 3D scanning technology, some 3D products in the market could be marketed in the form of 3D data in the future.

(2) Legal issues concerning 3D data

The distribution of 3D data on the Internet would allow various entities to engage in manufacturing activities. Since this could increase counterfeit production, it is necessary to consider the risk of distributing 3D data of a product protected under industrial property law and consequently facilitating infringement of the industrial property rights.

On the other hand, the distribution of 3D data is expected to encourage a large number of people to share data, exert their ingenuity in making creations, and develop new ideas and products, which might consequently result in new business projects and industrial development. Thus, it is necessary to study how to protect 3D data under industrial property law.

(i) Whether 3D data can be regarded as "program, etc."

From the perspective of the Patent Act, the treatment of 3D data would change depending on whether 3D data falls under the definition of "product." In other words, in order to consider that 3D data indirectly infringes any right holder's right for a product, the 3D data must be considered to be a "product" used for the production of the product. Similarly, 3D data would not be protected by an industrial property right unless it can be regarded as a "product." In order to consider 3D data as a "product," it must fall under the definition of "program, etc."

Regarding this point, the survey results revealed as follows. Not all 3D data can be regarded as "program, etc." While the type and number of data items included in 3D data could be taken into consideration when determining whether the 3D data can be regarded as "program, etc.," further examination is necessary. A significant number of respondents commented that none of the 3D data can be regarded as "program, etc."

These comments should be taken into account as well.

No clear criteria have been established to determine what type of 3D data can be regarded as "program, etc." However, according to the interview survey results, it can be said that 3D data can be regarded as "program, etc." if the 3D data satisfies two conditions in terms of the purpose of use and the technical aspect of the data as follows: (i) the 3D data can be used for the purpose of 3D printing or will be used only for the purpose of 3D printing and (ii) the 3D data has the function of shortening the production time and enhancing the configuration accuracy.

(ii) Infringement of industrial property rights by 3D data

We studied the 3D printing process and examined whether an act of preparing or distributing 3D data or an act of manufacturing products by use of 3D data could constitute infringement.

An act of preparing or distributing 3D data could constitute an act of indirect infringement if the 3D data can be regarded as "program, etc." An act of manufacturing products by use of 3D data would constitute direct infringement. On the other hand, if a person provides a 3D printer, a determination as to whether such act of aiding infringement constitutes an act of infringement or an act of tort under the Civil Code should be made in consideration of whether such person was aware that the 3D printer would be used to commit an act of infringement.

Currently, the answer to the question as to whether an act of preparing and distributing 3D data could constitute an act of indirect infringement under industrial property law would differ depending on whether the 3D data can be regarded as "program, etc." or not. Thus, in order to create an environment where any person engaging in 3D printing business can promote distribution of 3D data and production of products without any worries, we need to examine whether it is reasonable to determine whether 3D data infringes industrial property rights based on whether the 3D data can be regarded as "program, etc."

(iii) Protection provided for 3D data under industrial property law

At this moment, since no patent has been granted to 3D data, users cannot easily imagine what types of 3D data would be found patentable. Therefore, we need to continue discussions as to what types of 3D data should be protected under industrial property law and provide examination guidelines to users.

On the other hand, according to the survey results, some respondents said some types of 3D data should be protected, while other respondents said no protection should

be provided to 3D data. No respondents pointed out any problems related to 3D data distribution. Since 3D printing technology is still under development, high-value added 3D data could be created in the future. Thus, we need to continue examining how 3D data should be protected under industrial property law in consideration of the trends in the industry and the advancement of 3D printing technology.

(iv) Treatment of 3D data under industrial property law in other countries and region

We conducted a survey to gather information about the infringement of industrial property rights by 3D data and the possibility of providing protection for 3D data under industrial property law in the U.S., Europe, the U.K., Germany, France, China, and South Korea.

Among these countries and region, only in Japan and South Korea is a determination as to whether an act of handling 3D data can constitute infringement made in consideration of whether the 3D data can be regarded as a "product" under the Patent Act or the Design Act (Design Protection Act in South Korea).

In many countries, no clear determination has been made as to whether 3D data can be protected under industrial property law. Thus, we need to continue examining what types of 3D data can be protected and whether no protection should be given to 3D data, while collecting information about future technical development and the issues under discussion in other countries

III. Summary

Any creation made by use of AI could be protected under the current law as long as a human being has created it by using AI as a tool. However, with the advancement of technology, if the degree of human involvement becomes so small that AI can be considered to be making creations autonomously, those creations would not be protected under the current law, which only protects the rights of natural persons.

A learned model can be protected under industrial property law only if it is defined as "AI program plus a parameter," in other words "program, etc." On the other hand, if a learned model is defined merely as "parameter," it would be regarded as simple data and would not be regarded as "program, etc." and could not be protected under the Patent Act unless it has a certain data structure. According to the results of the questionnaire survey conducted abroad, if a learned model is defined merely as a parameter, the stances of those countries and region vary in terms of whether the learned model can be protected and which industrial property act should be applied. We need to conduct further research by gathering the latest information about learned models.

With the development of technology, it is difficult to predict how AI will be used and whether human involvement in creative activities will become smaller. Thus, it is necessary to continue our research, while taking into consideration how the manner of using AI technology in creative activities will change as a result of the development of AI technology. Based on the results of such research, we need to identify what part of the current legal system is insufficient or unclear.

From the perspective of the Patent Act, the treatment of 3D data would change depending on whether 3D data falls under the definition of "product." In order to consider 3D data as a "product," it must fall under the definition of "program, etc." Under the Design Act, indirect infringement could be recognized only if the 3D data is a "product."

So far, there is no clear definition of 3D data that can be regarded as "program, etc." However, if it is assumed that 3D data could be regarded as "program, etc." under certain conditions in terms of the purpose of use and the technical aspect of the data, those conditions would be (i) the 3D data can be used for the purpose of 3D printing or will be used only for the purpose of 3D printing and (ii) the 3D data has the function of shortening the production time and enhancing the configuration accuracy. At the same time, it should be noted that some people consider that none of the 3D data should be regarded as "program, etc."

The answer to the question as to whether an act of preparing and distributing 3D data could constitute an act of indirect infringement under industrial property law would differ depending on whether the 3D data can be regarded as "program, etc." or not. In order to create an environment where any person engaging in 3D printing business can promote distribution of 3D data and production of products without any worries, we need to examine whether it is reasonable to determine whether 3D data infringes industrial property rights or not based on whether the 3D data can be regarded as "program, etc."

Since 3D printing technology is still under development, high-value added 3D data could be created in the future. Thus, we need to conduct further examination on how 3D data should be protected under industrial property law in consideration of the demand for free distribution of 3D data and the development of 3D printing technology.