Date	May 29, 2008	Court	Intellectual Property High Court, Third Division
Case number	2007 (Ne) 10037		

– A case in which, with regard to an invention titled "porous glass and method of manufacturing the same," the court of prior instance determined the appellee to be the inventor and partially upheld the appellee's claim for damages for infringement of his/her right to honor as an inventor as well as his/her right to honor and feeling of honor; however, the Intellectual Property High Court revoked the judgment in prior instance, holding that the appellee only gave general advice and guidance as a manager and thus he/she cannot be found to be the inventor.

References: Article 2, paragraph (1), and the main paragraph of Article 29, paragraph (1) of the Patent Act

Summary of the Judgment

In this case, the appellee sought damages against the appellant, alleging as follows. The appellee made an invention in the process of a research project conducted based on a joint research agreement entered into between a company and a university. The appellant, while claiming to be the inventor of this invention, assigned the right to obtain a patent to a third party without obtaining permission from the company or the appellee and had such third party file a patent application for the invention (the "Claimed Invention"). The appellant further applied for subsidies from the Ministry of Education, Culture, Sports, Science and Technology by acting as if the Claimed Invention were a fruit of his/her own research activity. These acts of the appellant infringe the appellee's right to honor as an inventor as well as his/her right to honor and feeling of honor.

The court of prior instance determined the appellee to be the inventor of the Claimed Invention and partially upheld his/her claim.

In this judgment, the court held as follows with regard to the determination on the inventor, examined the details of the Claimed Invention based on this determination, and found as follows. The appellee had only received reports on the results of the experiments from the research student in the process that led to the creation of the Claimed Invention and did not find the usefulness of the Claimed Invention nor did he/she contribute to reaching a structure that was concrete and objective enough to enable a person ordinarily skilled in the art to achieve the intended technical effect through the repeated practice of the invention. Rather, the appellee only gave the research student general advice and guidance as a manager. As a result, the appellee cannot be found to be the inventor of the Claimed Invention. Finding as such, the court

revoked the judgment in prior instance and dismissed the appellee's claims.

(1) In accordance with Article 2, paragraph (1) and the main paragraph of Article 29, paragraph (1) of the Patent Act, as well as the judgment of the First Petty Bench of the Supreme Court of October 13, 1977, which decided on the completion of an invention, an inventor is a person who was involved in the highly advanced creation of technical ideas utilizing the laws of nature, in other words, a person who was involved in the creative activity of structuring the technical ideas concretely and objectively enough to enable a person ordinarily skilled in the art to work it.

(2) With respect to an invention, for example, the following persons would not be regarded as inventors: [i] a person who took charge of general management for his/her subordinate researchers as a manager; [ii] a person who gave general advice or instructions; [iii] a person who merely compiled data or conducted experiments as an assistant according to the instructions of the researcher; and [iv] a person who assisted or entrusted the completion of invention by funding the inventor or providing facilities such as the use of equipment.

(3) In order to become an inventor, it is not necessary for a person to be involved in every process and it would be sufficient to be involved in the creation of the invention jointly with others. Yet, in order for multiple persons to become joint inventors, such persons must make a substantial contribution in the process of conceiving of an idea to solve the problem and giving a concrete form to the idea under an integral and continuous cooperative relationship.

Judgment rendered on May 29, 2008
2007 (Ne) 10037 Appeal Case of Seeking Damages
(Court of prior instance: Tokyo District Court, 2005 (Wa) 13753)
Date of conclusion of oral argument: March 18, 2008

Judgment

Appellant (hereinafter referred to as the "Defendant"): Y

Appellee (hereinafter referred to as the "Plaintiff"): X

Main text

1. The judgment in prior instance shall be revoked.

2. The Plaintiff's claim shall be dismissed.

3. The court costs shall be borne by the Plaintiff for both the first and second instances.

Facts and reasons

No. 1 Judicial decisions sought by the parties

1. Defendant (appellant)

Same as the main text

2. Plaintiff (appellee)

(1) The appeal in question (the "Appeal") shall be dismissed.

(2) The cost of the appeal shall be borne by the Defendant.

No. 2 Outline of the case

The Plaintiff alleged as follows and claimed damages against the Defendant: The Defendant infringed the right of honor as an inventor, right of honor and feeling of honor held by the Plaintiff by conducting the following acts: (i) Although the Plaintiff created an invention in the process of a research project conducted based on a joint research agreement entered into between Kankyo Hozen Service, Co., Ltd. (hereinafter referred to as "Kankyo Hozen Service") and Kochi University, the Defendant, as the inventor of such invention, assigned the right to obtain a patent to a third party without obtaining permission from Kankyo Hozen Service and the Plaintiff and had such third party file a patent application; (ii) The Defendant applied for subsidies from the Ministry of Education, Culture, Sports, Science and Technology by giving the impression that the abovementioned invention was a fruit of his/her research activity; and (iii) The Defendant led an academic institution award an academic prize to him/her. Based on these allegations, the Plaintiff filed this action claiming payment of 10,000,000 yen as compensation for damages based on tort under Articles 709 and 710 of the Civil Code with money accrued thereon at the rate of 5% per annum for the period from July 11, 2005 to the date of completion of the payment. In the prior instance, the court upheld the Plaintiff's claim to the

extent of ordering payment of 1,000,000 yen (700,000 yen for tort of infringement of the right of honor as an inventor with respect to the filing of the application in question (the "Application") and 300,000 yen for tort of infringement of the feeling of honor due to false statement in the application form for subsidies). This is a case where the Defendant filed an appeal with respect to the judgment mentioned above.

The abbreviations used in this judgment follow those used in the judgment in prior instance.

1. Assumed facts

The content from line 1 of page 3 to line 10 of page 17 of the judgment in prior instance (excluding the content from line 10 to line 20 of page 14 of the judgment in prior instance) shall be cited.

2. Issues in this case

(1) Whether or not the Plaintiff is the inventor of the Claimed Invention

(2) Whether or not the Defendant infringed the right of honor as an inventor held by the Plaintiff, by having a third party file a patent application for the Claimed Invention

(3) Whether or not the Defendant infringed the right of honor held by the Plaintiff, by applying for the subsidies in question (the "Subsidies")

(4) Whether or not the Defendant infringed the feeling of honor held by the Plaintiff, by receiving an academic prize

(5) The specific amount of damages

3. Allegations of the parties regarding the issues (including supplementary allegations made in this instance)

(omitted)

No. 3 Court decision

1. Background that led to the creation of the Claimed Invention

According to the assumed facts found in the prior instance as well as the evidence submitted (those listed in each of the items) and the entire import of the oral argument, the following facts are found.

(1) Parties

A. The Plaintiff, who was a professor of the Research Laboratory of Hydrothermal Chemistry of Kochi University as of 1998, retired from the university in March 1999, and became a professor of Tohoku University after working at a private company.

The Defendant, who was an assistant professor of the Research Laboratory of Hydrothermal Chemistry of Kochi University as of 1998, succeeded to the position of the professor after the Plaintiff's retirement.

B. M, who majored in chemistry at the Faculty of Sciences of the National University of Colombia and graduated after obtaining a bachelor's degree by carrying out research concerning cokes, engaged in research activities focused on organic and inorganic chemistry as an assistant at the National University of Colombia. Later, M carried out research mainly on inorganic chemistry including ceramics, glasses and minerals at a research institute of materials science, geology and chemistry in Colombia as well as at the Faculty of Mechanical Machining of the Technological Institute of Saltillo in Mexico. During that time, M also studied abroad at Tohoku University as a research student. However, M never had the chance to learn about hydrothermal chemistry or hydrothermal hot pressing method (undisputed facts, Exhibits Otsu 51-1 and 51-2, testimony by witness M and the entire import of the oral argument).

In April 1998, M joined the master's course of the Graduate School of Science of Kochi University and carried out research on extract of titanium and rare earth from Colombia's black sand under the Plaintiff as the academic advisor (Exhibits Otsu 1, 84-1 and 84-2).

M's husband C served as a research assistant of the Defendant at the Research Laboratory of Hydrothermal Chemistry from June 1997 until March 2000 (Exhibits Otsu 49-1 and 49-2).

(2) Background to the Claimed Invention

A. In around April 1998, Kankyo Hozen Service proposed the joint research in question ("Joint Research") to Kochi University and the Plaintiff, who was in charge of the Joint Research, employed M as a part-time assistant for the experiments to be conducted in the Joint Research for 50,000 yen per month. On this occasion, the Plaintiff explained to M the outline of the experiments to be conducted in the Joint Research (i.e. to mix waste glass and other materials such as used paper and kenaf to prepare a glass solidified body), in addition to making general explanations regarding the hydrothermal chemistry or hydrothermal hot pressing method and had M conduct such experiments. Moreover, the Plaintiff instructed M to prepare and submit a report once in four months (undisputed facts, Exhibits Ko 7, 20, 29, 30 and 57, Exhibits Otsu 1 and 9-1, testimony by witness M and results of the examination of the Plaintiff).

B. While the Joint Research started from around May 1998, Kankyo Hozen Service submitted the application form for the Joint Research (Exhibit Ko 2) on July 8 of the same year to Kochi University due to delay in the paper-based process, and the joint research agreement (Exhibit Ko 3) between the two parties was prepared on January 18, 1999.

The contents of the Joint Research are as follows.

(Title, etc. of the Joint Research)

Article 1 X (Kochi University) and Y (Kankyo Hozen Service) will implement the following joint research.

(1) Research title

Development of a recycling technique for pulverized materials of waste glass by using

hydrothermal hot pressing method

(2) Object and contents of the research

Technologies to solidify pulverized materials of glass bottles at low temperature will be developed on the basis of hydrothermal hot pressing method. In addition, technologies to transform the pulverized materials into soil improvement materials will be developed for the purpose of creating a recycling technique for pulverized materials of glass bottles that is in harmony with the environment.

(3) Place of implementation of research

Research Laboratory of Hydrothermal Chemistry of Kochi University

(Research Period)

Article 2 The research period of the Joint Research shall start on February 5, 1999 and end on March 31, 1999.

(Persons to Be Engaged in the Joint Research)

Article 3 X and Y will have the persons set forth in Appended Table 1 (note of the judgment: the Plaintiff for Kochi University and D for Kankyo Hozen Service) participate in the Joint Research, respectively. [...]

(Burden of Research Expenses)

Article 4 X and Y will bear the respective research expenses set forth in Appended Table 2 (note of the judgment: 420,000 yen of direct expense for Kochi University and 2,500,000 yen of direct expenses and 420,000 yen of research fees for the plaintiff company).

(Patent Application)

Article 10 When X intends to file a patent application in the case where a staff that belongs to X has independently created an invention as a result of the Joint Research and has vested the right to obtain a patent for the invention in the State, X will obtain consent from Y in advance with respect to the act of independently creating the invention.

(Working of Invention on a Priority Basis)

Article 11 X may license the right to obtain a patent succeeded to by X or the patent right obtained based thereon […] with respect to an invention created as a result of the Joint Research only to Y or the person designated by Y for a period not exceeding 10 years from the filing of the application […] as the period to work the patent on a priority basis.

(Handling of Research Results)

Article 16 The results of the Joint Research shall be published in principle. However, the timing and method for publication shall be decided based on a consultation between X and Y.

(Undisputed facts, Exhibits Ko 3 and 53 and Exhibit Otsu 9-1)

C. At first, when experiments for the Joint Research were started, M carried out the experiments as instructed by the Plaintiff. However, M deepened her understanding of hydrothermal

chemistry or hydrothermal hot pressing method by reading relevant academic papers and receiving instructions regarding the mechanism of hydrothermal hot pressing, etc. from the Defendant and started making proposals regarding the methods of experiments to the Plaintiff and holding discussions with the Plaintiff (Exhibits Ko 30 and 57, Exhibits Otsu 18, 19, 25-1, 25-2 and 26 and results of the examination of the Plaintiff).

D. On June 10, 1998, M prepared the first report (the "First Report"; Exhibits Ko 4-1 and 4-2) and submitted it to the Plaintiff, who sent it to Kankyo Hozen Service around the same month. The First Report contains the following statements.

"I. Objective

The initial approach is conducted to determine the degree/level of solidification of waste glass under hydrothermal hot pressing conditions. This research aims to achieve the most economically beneficial conditions for utilizing waste glass by using hydrothermal hot pressing treatment.

II. Experiments

A. Preparation of waste glass samples

Waste glass was applied to a machine at 12 hours intervals and pulverized into pieces by using Al_2O_3 balls. After being applied to the machine, the glass was sifted by a maximum of 250 nets […]"

At the end of the same month, M, who thought measurement of the tensile strength was necessary for research of solidification, consulted with C and learned about the Brazilian test from him. M further read academic papers concerning such test and decided to incorporate it in the evaluation items for the future experiments (Exhibits Otsu 25-1, 25-2, 26, 49-1 and 49-2).

E. M prepared the second report (the "Second Report"; Exhibits Ko 5-1 and 5-2) and submitted it to the Plaintiff, who sent it to Kankyo Hozen Service at the end of July 1998. The Second Report contains the following statements.

"I. Scope

The objective of the experiment at this stage is to determine the cheapest processing conditions to compress waste glass […].

II. Experiment

1. Hydrothermal hot pressing treatment

The main body of the autoclave has a piston cylinder type structure with a diameter of 30mm. After the sample powder with a fixed water content is put into the cylinder, pressure will be applied to the piston from the top and bottom to press the sample into a uniaxial direction.

Accordingly, the sample will be maintained while it is solidified under the designated hydrothermal condition.

III. Results and Discussions

According to the results, low water content does not allow glass particles to contact with each other in a preferable manner under this hydrothermal condition. This phenomenon caused by water showed a rise change up to a water content of 10wt%. Moreover, it was observed from Figure 5 and SEM picture 7 that this phenomenon created a new stage and resistance of glass wherein diffusion of water to the glass is extremely stable."

(3) Background to the discovery of porous phenomenon by M

A. The Plaintiff was not satisfied with the strength of the glass solidified body which was obtained by hydrothermal hot pressing method in the process of the Joint Research, and instructed M to conduct a heating experiment by the DTA (differential thermal analysis) method for the glass solidified body.

In response to this, M consulted with the Defendant, who was in charge of managing experimental equipment at the Research Laboratory of Hydrothermal Chemistry. The Defendant explained that TG-DTA thermal analysis equipment (differential thermogravimetric simultaneous measurement equipment) cannot be used for the analysis instructed by the Plaintiff since there is a risk that the glass sample may flow out of the specimen holder and damage the equipment, and instead proposed to use the smaller one of the two platinum crucibles to conduct the analysis (undisputed facts, Exhibits Ko 6-1 and 6-2, Exhibits Otsu 1 and 7-1, testimony by witness M and the results of the examinations of the Plaintiff and the Defendant).

B. Around October 1998, M reheated blue glass, which had been compressed under the conditions of 200°C, 60MPa, for two hours and at a water content of 12wt%, in advance for 5 days at 105°C and then reheated it at 750°C for one hour by using a platinum crucible. As a result, the glass solidified body had a porous appearance caused by foaming. This foam showed a pumice shape with no softness like cotton. As such, M showed the platinum crucible and reported the results of the experiment to the Plaintiff, who instructed M to further conduct electronic microscopic photographing (taking SEM pictures, etc.) and to prepare a report. M had conducted reheating at 700°C prior to the abovementioned experiment, but could not find any porous phenomenon (undisputed facts, Exhibits Ko 6-1 and 6-2, Exhibits Otsu 1, 7-1, 22-4, 82, 84-1 and 84-2, testimony by witness M and results of the examinations of the Plaintiff and the Defendant).

In November of the same year, M prepared the Third Report (Exhibits Ko 6-1 and 6-2) according to the instructions of the Plaintiff and attached a remark stating that "This result is particularly important" as mentioned below with respect to the porous phenomenon.

The Third Report (Exhibit Ko 6-1) contains the following statements.

"II. Experiment

1. Process of hydrothermal hot pressing

The experiment was conducted by using the hydrothermal hot pressing method used for

solidification synthesis and the same type of autoclaves which were previously used (see Report No. 2). […] when the sample powder with the predetermined water content is put into the cylinder, pressure is applied to the piston from the top and bottom to compress the sample in a uniaxial direction. […] Accordingly, the sample will be maintained through the solidification reaction under any hydrothermal condition.

The heating action of the autoclave was performed by using a sheet-type heater. The heating rate for most of the glass samples was set at a temperature between 130°C and 225°C and 5°C/min. In compressing the sample, 100KN instron universal testing machine was used and a pressure of 60MPa was provided.

III. Results and Discussions

Figure 1 outlines the physical characteristics of the reaction of the compressed blue glass […] and the temperature, water content and pressure of the uniaxial at various points of time during the experiment. The figure shows that only the water content and temperature have major influence on the relative density and tensile strength. Accordingly, when the temperature rises, the density and tensile strength increase. Moreover, when the water content is 10wt% as in the bottom figure, the characteristics mentioned above (i.e. relative density and tensile strength) increase. When the water content decreases, the tensile strength substantially decreases.

Furthermore, the blue glass which was compressed under the conditions of 200°C, 60MPa, for two hours and at a water content of 12wt% was reheated in advance for five days at 105°C and then reheated for an hour at 750°C. This process generated a porous appearance as shown in the SEM picture (Figure 9). This result is particularly important. This is because when the blue glass was reheated to 300°C, a slight water loss was shown and in this case, many cracks were considered to have been generated at the solution stage. At the temperature of 750°C, much of the water loss was generated at the liquid stage and the blue glass had a large porosity and this temperature rise is likely to have softened the glass.

IV. Conclusion

3. In general, when the water content increases to a maximum of 10wt%, the tensile strength increases.

4. When the glass was reheated at 105°C for five days in the air, water loss was small and there was hardly any change until the temperature reached 300°C. Many cracks appeared in the water phase and generated a weak structure. However, when the glass was reheated for an hour at 750°C in the air, the glass had a stronger porous structure."

C. On around November 4, 1998, the Plaintiff visited Kankyo Hozen Service with M. On that occasion, the Plaintiff and M made explanations based on the Third Report in Japanese and in English, respectively, to the company (undisputed facts, Exhibits Ko 7 and 53 and the entire import of the oral argument).

D. After the abovementioned experiment, the Plaintiff never measured the physical property of the porous glass such as the density, mechanical strength and characteristics of pores and terminated the research at this point of time (Exhibit Ko 20 and Exhibit Otsu 1).

E. In 1999, the Plaintiff submitted to Kochi University the "FY1998 Implementation Report of 'Joint Research with the Private Sector, etc.'" (Exhibit Otsu No. 60) with respect to the Joint Research. The report contains the following statements.

* Research title

Development of a recycling technique for pulverized materials of waste glass by using hydrothermal hot pressing method

* Outline of the research result

A few types of waste glass were hot pressed and solidified by changing the quantity of water to be added and the temperature. The maximum tensile strength was 65MPa and the HHP conditions were 200°C, 60MPa, addition of 10wt% water and a two hour duration. Hot pressing was conducted under the same conditions by mixing used paper, calcium hydroxide and kenaf. The maximum tensile strength was 40.3MPa, 39.7MPa and 51MPa (5wt% kenaf), respectively.

* Future utilization of the research results

The research result enables disposition of waste at low costs and the composite solidified substance may be used for panel insulating material, wall material, decorative material and building material, etc.

F. In July 1999, M, the Defendant and the Plaintiff published an academic paper titled "Recycling of waste glass using hydrothermal hot pressing method" in "Journal Materials Science letters."

(4) Background to the research conducted by M and the Defendant

A. In association with the retirement of the Plaintiff from Kochi University in March 1999, the academic advisor of M changed from the Plaintiff to the Defendant. Around that time, M consulted with the Defendant and decided to change the research theme from the initial one, i.e. research on black sand, to a new one, i.e. recycling of waste glass by hydrothermal hot pressing method, since there was no progress in the initial research theme due to lack of experimental data. M then obtained consent form the Plaintiff and continued her research activities under the Defendant's instructions. The Defendant instructed M to prepare solidified glass by changing the conditions of hydrothermal hot pressing, i.e. quantity of water, pressure, temperature and time, and to prepare various types of foams by changing the temperature, etc. to reheat and foam glass and thereby clarify the influence of the respective conditions on the density or mechanical strength of the foam (testimony by witness M and results of the examinations of the Plaintiff and the Defendant).

In February 2000, M compiled the master's thesis in question ("Master's Thesis"; Exhibits

Otsu 2-1 and 2-2) and completed the master's course of Kochi University in March of the same year. The Defendant had obtained consent from the Plaintiff to use hydrothermal processing of glass as M's research theme for the master's course (Exhibit Ko 13 and results of the examination of the Defendant).

The Master's Thesis contains the following statements (Exhibit Ko 39 and Exhibits Otsu 2-1, 2-2 and 83).

"Chapter 4 Synthesis of Porous Glass Material

4.1 Introduction

In this Chapter, with an aim to transform waste into intelligent material, porous glass material was prepared from waste glass. First, a glass solidified body was prepared from waste glass by using hydrothermal hot pressing method and then normal calcination of the glass solidified body was conducted in the air at various temperatures with an expectation that the water in the new phase formed by the hydrothermal reaction between glass and water would evaporate and form pores during heating.

4.2 Experiment method

4.2.1 Materials

The chemical compositions of the blue glass powder used in the experiment were decided by quantitative wet chemical analysis, […] and then the glass was pulverized into powder that has a particle size distribution of 46 to 53μm.

4.2.2 Hydrothermal hot pressing preparation of glass solidified body by hydrothermal hot pressing method

The densification process was […] conducted by using hydrothermal hot pressing autoclave. Blue glass powder (10g) and water (5 to 20wt%) were mixed and kneaded in a mortar. The glass powder was placed in the reaction chamber of the autoclave and then was subjected to uniaxial pressing at the pressure of 5 to 60MPa while using a heating rate of 5°C /min […].

In order to determine the thermal conductivity, 200g of blue glass powder was mixed and kneaded with 10wt% water in a mortar. The sample was […] placed in the reaction chamber of the autoclave. The following hydrothermal hot pressing conditions were used.

Temperature: 200°C, Load pressure: 21MPa, Reaction time: two hours, temperature rising rate/temperature falling rate: 1°C /min

4.2.3 Preparation of porous glass

The glass solidified body prepared by the hydrothermal hot pressing method was heated in a platinum crucible for three hours at the temperature between 50°C and 850°C. All of the samples were heated at 5°C/min and then cooled to room temperature.

4.3 Results and Consideration

4.3.1 Calcination behavior

The influence of the calcination temperature of the solidified body on weight loss is shown in Figure 4-1. When the solidified body was heated, weight loss was observed due to the evaporation of water contained in the glass solidified body. When the calcination temperature rose, the amount of weight loss increased as well. [...] In every sample synthesized by adding 12wt% or more water, it was shown that the water content of the new phase was the same.

4.3.2 Influence of the water content and burning temperature on the bulk density of the obtained porous glass

Figure 4-2 shows the bulk density of the porous glass prepared by heating the glass solidified body synthesized by the hydrothermal method with various water contents. […] After being heated at a high temperature of 600°C or higher, the bulk density of the glass solidified body substantially decreased and pores were formed in the solidified body. […]

Figure 4-6 (note of the judgment: Figure 4-3 is found to be a misdescription) shows the influence of the water content at the time of preparation of the glass solidified body on the compressive strength of the porous glass. In particular, a water content of 10wt% or more did not have a major influence on the figure of the compressive strength. In contrast, low water content (5wt%) caused substantial decrease of the compressive strength of the product.

4.3.3 Influence of the calcination temperature

A glass solidified body was prepared under the following conditions: 200°C, 21Mpa, for three hours and at a water content of 10wt%. The solidified body was subjected to calcination for one hour in the air at various temperatures.

After the calcination at 650°C, formation of initial small pores was observed but their structures were non-uniform. When calcination was conducted at higher temperatures, the diameter of the pores in the solidified body increased. The pores are surrounded by thin glass walls and are considered to be closed. Major changes were not observed at high temperatures of 750°C or higher.

The influence of the calcination temperature on the compressive strength of porous glass is shown in Figure 4-4 (note of the judgment: Figure 4-5 is found to be a misdescription). The sample subjected to calcination at low temperatures not exceeding 700°C had lower compressive strength. When the solidified body was heated to 750°C, the strength of the porous glass remarkably increased. The maximum compressive strength of the porous glass which was obtained by one hour calcination at 750°C from the glass solidified body synthesized by hydrothermal hot pressing under the following conditions, i.e. 200°C, 21MPa, for two hours and at a water content of 10wt%, was approximately 14MPa. […]

4.3.4 Influence of load pressure

Except for low load pressure (<10MPa) which caused low compressive strength, the compressive strength showed an approximately constant value with respect to the load pressure.

This means that 10MPa or higher load pressure has no major influence on the compressive strength of the porous substance obtained.

4.4 Summary

The sample substantially expanded along with the major weight loss that occurred due to the evaporation of water caused by the heating in the air for an hour at 750°C. The porous product had low water penetration power and low thermal conductivity of 0.2159W/mK. The maximum compressive strength obtained was 14MPa and the bulk density was 0.2785g/cm^3. By using this method, it is highly possible to prepare porous glass. The prepared porous sample is useful for thermal insulating material thanks to its low thermal conductivity."

B. When the First to Third Reports are compared with the Master's Thesis, the following differences are found (Exhibit Otsu 83 and the entire import of the oral argument).

(A) The First to Third Reports only show one experimental point (heating the blue glass which was compressed under the conditions of 200°C, 60MPa, for two hours and at a water content of 12wt% for five days at 105°C and then reheating it at 750°C for one hour).

(B) The Master's Thesis has the following experimental point which was not mentioned in the First to Third Reports.

(i) The amount of weight loss is measured by changing the heating temperature and the results of the measurement are stated as the shrinkage curve of the glass powder (Figure 4-1).

(ii) The bulk density is measured by changing the heating temperature (Figure 4-2).

(iii) SEM pictures of the sample which was heated by changing the heating temperature in the order of 350°C, 650°C, 750°C and 850°C are taken (Figure 4-3).

(iv) The compressive strength of the foam to the heating temperature (Figure 4-4), the compressive strength of the madreporic body to the load pressure (Figure 4-5) and the compressive strength of the madreporic body to the water content (Figure 4-6) were measured.

C. In November 2000, M made a presentation of the same content as that of the Master's Thesis at an international conference held in Mexico. The presenters included M's husband C and the Defendant in addition to M but not the Plaintiff (Exhibit Otsu 12).

D. Around May 2001, the Defendant and S conducted research on the hydrothermal reaction of silicate glass and the influence thereof on the generation of porous glass. In August of the same year, S compiled the research results in a report titled "Synthesis of porous glass powder and porous glass products" (Exhibits Otsu 4-1 through 4-3 and 5).

(5) Filing of a patent application for the Claimed Invention

A. On September 17, 2001, the Defendant submitted the notice of invention in question ("Notice of Invention") to Kochi University, and on the 19th of the same month, the State decided not to succeed to the right to obtain a patent with respect to the relevant invention (Exhibits Ko 59 and 60). As such, the Defendant assigned the right to obtain a patent to TN Shikoku and on

September 25, 2001, the company filed the Application that contains the following contents with respect to the Claimed Invention (Exhibit Ko 1 and entire import of oral argument).

Application Number: Patent Application No. 2001-290418

Title of the invention: Porous Glass and Method of Manufacturing the Same

Inventor: The Defendant

Contents of the Claimed Invention: As stated in 2.(2) below.

B. The Defendant entrusted the application business in question to patent attorney P. In the application related documents, the following three methods were stated as the scope of claims: (i) a method to manufacture a madreporic body and hollow glass sphere by heating and foaming the glass after processing the glass under hydrothermal conditions and dispersing water inside the glass; (ii) a method to prepare porous glass by the steps of adding water to glass powder, applying pressure to them, molding them under hydrothermal conditions and foaming the molded body by heating; and (iii) a method to manufacture a hollow glass sphere by heating and foaming the glass powder which has been processed in high temperature water vapor.

In addition, the following problems intended to be solved by the invention and method to solve such problems are stated: (i) a madreporic body can be prepared only from glass; (ii) the pores of the madreporic body are closed and the madreporic body can float on water; (iii) waste glass can be used as raw materials; and (iv) the manufacturing yield of the hollow glass sphere is high thanks to the uniform synthesis of raw materials realized by the implementation of hydrothermal treatment.

In addition, the working example of porous glass using hydrothermal hot pressing method and the working example of a madreporic body of glass powder using hydrothermal treatment method are stated (Exhibits Otsu 64-2 through 64-5).

(6) Application for Subsidies in Question filed by the Defendant to the Ministry of Education, Culture, Sports, Science and Technology

A. Around July 2002, the Defendant filed the application for subsidies in question ("Application for Subsidies") to the Ministry of Education, Culture, Sports, Science and Technology (Exhibit Ko 9) and in September of the same year, the Application for Subsidies was accepted and the Defendant received subsidies of approximately 94,000,000 yen.

B. The application form contains the following statements.

* Title of the development subject

Development of technology for recycling waste glass bottles into porous lightweight plate and heat insulating material

* Applicant (Representative person)

The Defendant

* Developer

The Defendant (Representative developer), E (assistant developer) and F (assistant developer)

* Management organization

TN Shikoku

* Background and Purpose of Development

"In the past, glass was foamed by adding to a glass powder foaming agent such as calcium carbonate and silicon carbide which resolves and generates gas at high temperature. In this method, the range of temperatures at which gas is generated from the foaming agent is extremely narrow and the glass itself must be softened at the time of foaming, and thus it is extremely difficult to control foaming. Especially, it is difficult to prepare uniform and large foam. In contrast, this research development intends to prepare a madreporic body by utilizing the hydrothermal technology held by the applicants and using a new technology wherein the glass foams when the water in the glass evaporates by dispersing water in advance in the glass particles and applying heat thereto.

The applicants have discovered that, as a result of heating in the air solidified body which has been obtained by applying hydrothermal hot pressing (see explanation of terms) to glass powder, foaming phenomenon occurs and a lightweight madreporic body with a density of about 0.3g/cm^3 can be prepared (a patent application has been filed: Patent Application No. 2001-290418). However, this method is not suitable for industrialization since each solidified body must be prepared in a batch at first and it is also difficult to control the shape. As such, in order to industrialize the manufacture of porous glass by using the technology in question, it is necessary to establish a method wherein the glass will be molded and foamed after being subjected to hydrothermal treatment (see explanation of terms) in a powder state without being hot pressed. In the previous research, it has been confirmed at the laboratory level that porous glass can be obtained by heating the glass powder that has been subjected to hydrothermal treatment and molded. In addition, it is planned to file a patent application for this method.

This research development is aimed at establishing a technology to prepare a large madreporic body at low cost from waste glass bottles that are only used for landfilling, etc. and using porous glass as heat insulating material and lightweight plates and thereby remedying the pollution problem caused by polystyrene foam and contributing to the creation of society in harmony with nature, which is a proposition of modern society. "

*Explanation of terms

Term: "Hydrothermal hot pressing method;" Explanation: "A method to solidify inorganic powder under hydrothermal conditions that has been developed independently by the Research Laboratory of Hydrothermal Chemistry. A solidified body with high mechanical strength can be manufactured by compressing the powder which is under hydrothermal conditions from the

exterior of the autoclave, squeezing the water existing in the gap between the particles and densifying the powder while connecting the particles by hydrothermal reaction."

Term: "Hydrothermal treatment (hydrothermal reaction);" Explanation: "To heat substances at a state wherein water exists under high temperature and high pressure not lower than 100°C and one atmospheric pressure. […] Boiling of water can be suppressed and water under high temperature and high pressure can be obtained by heating the sealed pressure vessel (autoclave) containing water."

(7) Receiving of academic prize by the Defendant

In January 2005, the Defendant received an academic prize from the Ceramic Society of Japan with respect to the research on the new development of hydrothermal reaction technology (Exhibit Ko 46). The following statement is contained in the reasons for recommendation.

"The Defendant developed the following three types of new hydrothermal reaction technology as mentioned below and thereby developed new hydrothermal synthesis method.

(i) In the single crystal growth technology, […].

(ii) In the direct synthesis technology for complex oxide, […].

(iii) In the technology for creation of a madreporic body, the Defendant developed a new synthesis technology to prepare a madreporic body having uniform pore size near the boundary between macropore and meso-pore by carrying out hydrothermal treatment while applying pressure to the powder which is under hydrothermal conditions. In addition, the Defendant developed a technology to recycle waste glass bottles by creating porous foam from waste glass bottles by utilizing hydrothermal reaction."

(8) The Doctoral Thesis in Question

In April 2005, M applied for the doctor's degree to Kochi University, and in September of the same year, she was granted the doctorate of science from Kochi University based on the Doctoral Thesis (Exhibits Ko 40 and 41 and Exhibit Otsu 6).

2. Regarding Issue 1 (Whether or not the Plaintiff is the Inventor of the Claimed Invention)

(1) Introduction

It is provided that an invention means the highly advanced creation of technical ideas utilizing the laws of nature (Article 2, paragraph (1) of the Patent Act) and that an inventor of an invention that is industrially applicable may be entitled to obtain a patent for said invention […] (the proviso to Article 29, paragraph (1) of said Act). In addition, it should be construed that the invention has been completed when the technical contents have been structured concretely and objectively enough to enable a person ordinarily skilled in the art to reproduce the invention and achieve the intended technical effect (judgment of the First Petty Bench of the Supreme Court of October 13, 1977, Minshu Vol. 31, No. 6 at 805). Accordingly, an inventor is a person who was involved in the highly advanced creation of technical ideas utilizing the laws of nature, in

other words, a person who was involved in the creative activity of structuring the technical ideas concretely and objectively enough to enable a person ordinarily skilled in the art to work it. With respect to the invention, for example, the following persons would not be regarded as inventors: (i) a person who took charge of general management for his/her subordinate researchers as a manager; (ii) a person who gave general advice or instructions; (iii) a person who merely compiled data or conducted experiments as an assistant according to the instructions of the researcher; and (iv) a person who assisted or entrusted the completion of invention by funding the inventor or providing facilities such as the use of equipment. Of course, in order to become an inventor, it is not necessary for a person to be involved in every process and rather, it would be sufficient even if multiple persons are jointly involved in the creation of invention. Yet, in order to have multiple persons to become joint inventors, such persons must make a substantial contribution in the process of conceiving of an idea to solve the problem and giving a concrete form to the idea under an integral and continuous cooperative relationship.

Based on the abovementioned standpoint, this court will determine whether or not the Plaintiff is the inventor of the Claimed Invention by comprehensively taking into consideration the contents of the Claimed Invention as well as the degree of involvement of the Plaintiff.

(2) Contents of the Claimed Invention

A. Statements in the description in question ("Description") (Exhibit Ko 1)

(A) Scope of claims

(i) Claim 1

A porous glass characterized by being prepared as a madreporic body with pores inside which has been prepared by obtaining a solidified body with dispersed water by the application of hydrothermal treatment to the kneaded material consisting of glass powder and water and then foaming the solidified body by heating.

(ii) Claim 2

A porous glass characterized by being prepared as a madreporic body with pores inside which has been prepared by obtaining a solidified body with dispersed water by the application of pressure to the kneaded material consisting of glass powder and water inside the autoclave, heating of the solidified body until it reaches a predetermined temperature while maintaining the pressure state, molding under hydrothermal conditions and cooling after keeping the molded body for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in a heating furnace.

(iii) Claim 3

A porous glass stated in Claim 1 or 2 whose pores are closed.

(iv) Claim 4

A method of manufacturing a porous glass which is characterized by being prepared so as

to have closed pores inside by dispersing water in the glass by the application of hydrothermal treatment to the glass and water and then foaming them by heating.

(v) Claim 5

A method of manufacturing a porous glass which is characterized by being prepared so as to have closed pores inside by obtaining a solidified body with dispersed water by the addition of water to the glass powder and kneading thereof, application of a predetermined pressure to such kneaded material inside the autoclave, heating of the kneaded material until it reaches a predetermined temperature while maintaining the abovementioned pressure and molding of the kneaded material under hydrothermal conditions using water vapor, and cooling of such molded body to room temperature after keeping it for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in a heating furnace.

(vi) Claim 6

A method of manufacturing a porous glass which is characterized by being prepared so as to have closed pores inside by obtaining a solidified body with dispersed water by the pulverization of waste glass used as raw materials and the classification thereof, addition of water to the obtained glass powder and the kneading thereof as well as the filling of such kneaded material inside the piston cylinder type autoclave and the application of a predetermined pressure, molding under hydrothermal conditions after heating to a predetermined temperature while maintaining the abovementioned pressure, and cooling of the molded body to room temperature after keeping it for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in an electric furnace.

(vii) Claim 7

A method of manufacturing the porous glass stated in Claim 4, 5 or 6 whose particle diameter of the glass powder is not larger than 50μm.

(viii) Claim 8

A method of manufacturing the porous glass stated in Claim 4, 5, 6, or 7 wherein the quantity of water to be added to the glass powder is 10wt% or more.

(ix) Claim 9

A method of manufacturing the porous glass stated in Claim 4, 5, 6, 7 or 8 wherein the pressure to be applied to the glass powder inside the autoclave is 10MPa or more.

(x) Claim 10

A method of manufacturing the porous glass stated in Claim 4, 5, 6, 7, 8 or 9 wherein the heating temperature by a heating furnace is 750°C or higher.

(xi) Claim 11

A method of manufacturing the porous glass stated in Claim 4, 5, 6, 7, 8, 9 or 10 wherein the temperature rising rate and temperature falling rate inside the autoclave is 1°C /min.

(B) Detailed Explanation of the Invention

(i) "This invention is related to a porous glass and the manufacturing method of the same. In particular, this invention is related to a porous glass which has versatility as a filler, etc. aimed at weight saving and strengthening of heat insulating material and plastics as well as the method of manufacturing such porous glass." ([0001] [Technical field to which the invention pertains])

(ii) "However, the previous method of preparing a madreporic body by using glass as raw material had the following problems: there were limitations in selecting and securing raw materials since it is necessary to add clay as the binding agent and limestone, etc. as the foaming agent in addition to glass as raw materials and the raw materials of the hollow glass sphere which is called Silas Balloon are also products of nature; and the manufacturing yield deteriorates due to the defects of inferior uniformity of quality caused by non-uniform foaming phenomenon at the time of manufacture. The method also had the problem that the obtained porous glass contains many open pores and thus is not water floatable." ([0004] [Problems to be solved by the invention])

(iii) "As such, this invention aims to solve the problems mentioned above and to provide a porous glass which is manufactured by using only a variety of waste glass and other glasses as raw materials and implementing hydrothermal treatment using water vapor without using binding agents or various kinds of chemicals and which has closed pores, uniform quality and water floatability thanks to uniform foaming phenomenon with preferable manufacturing yield and reduced costs." ([0008])

(iv) "In order to achieve the aim mentioned above, this invention provides a porous glass which has been prepared as a madreporic body with pores inside by obtaining a solidified body with dispersed water by the application of hydrothermal treatment to the kneaded material consisting of glass powder and water and then foaming the solidified body by heating; and a porous glass which has been prepared as a madreporic body with pores inside by obtaining a solidified body with dispersed water by the application of pressure to the kneaded material consisting of glass powder and water inside the autoclave, heating of the solidified body until it reaches a predetermined temperature while maintaining the pressure state, molding under hydrothermal conditions and cooling after keeping the molded body for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in a heating furnace. The pores are closed." ([0009])

(v) "Moreover, this invention provides a method of manufacturing a porous glass which has been prepared so as to have closed pores inside by dispersing water in the glass by the application of hydrothermal treatment to the glass and water and then foaming them by heating;

a method of manufacturing a porous glass which has been prepared so as to have closed pores inside by obtaining a solidified body with dispersed water by the addition of water to the glass powder and kneading thereof, application of a predetermined pressure to such kneaded material inside the autoclave, heating of the kneaded material until it reaches a predetermined temperature while maintaining the abovementioned pressure and molding of the kneaded material under hydrothermal conditions using water vapor, and cooling of such molded body to room temperature after keeping it for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in a heating furnace; and a method of manufacturing a porous glass which has been prepared so as to have closed pores inside by obtaining a solidified body with dispersed water by the pulverization of waste glass used as raw materials and the classification thereof, addition of water to the obtained glass powder and the kneading thereof as well as the filling of such kneaded material inside the piston cylinder type autoclave and the application of a predetermined pressure, molding under hydrothermal conditions after heating to a predetermined temperature while maintaining the abovementioned pressure, and cooling of the molded body to room temperature after keeping it for a certain period of time, and then foaming the solidified body by the application of heat for a predetermined period of time in an electric furnace." ([0010])

(vi) "The particle diameters of glass powder used as raw materials is 50μm or smaller and the quantity of water to be added to the glass powder will be 10wt% or more. The pressure to be applied to the glass powder inside the autoclave will be 10MPa or more and the heating temperature in the heating furnace will be 750°C. In addition, the temperature rising rate and temperature falling rate inside the autoclave will be 1°C/min." ([0011])

(vii) "Based on such porous glass and the manufacturing method thereof, a solidified body with water dispersed inside will be obtained by molding a variety of waste glass and other glass powders by hydrothermal treatment using water vapor alone inside the autoclave and then cooling them to room temperature after keeping them for a certain period of time. By heating this solidified body for a predetermined period of time inside a heating furnace, the glass itself softens and simultaneously releases water, which produces a foaming phenomenon by the water being released as vapor at high temperature and generating bubbles and thereby a porous glass that has a predetermined density, compressive strength and thermal conductivity which is light and water floatable and has closed pores will be obtained." ([0012])

(viii) "As a result, the preferable hydrothermal conditions, etc. to work this invention can be summarized as follows.

* Type of glass: Blue, green, brown and colorless (every type)
* Quantity of water to be added: 5 to 20wt% (preferably 10 to 15wt%)
* Molding pressure: 5MPa or more (preferably 10MPa or more but 10MPa is sufficient)

* Molding temperature: 150 to 250°C (preferably 180°C or higher)

* Heating rate and cooling rate for molding: Slow (for example, 1°C/min. is preferable)

* Foaming temperature: 650 to 850°C (preferably 750°C; low temperature results in insufficient foaming while high temperature results in small bubbles due to explosion and shrinking of the foam)

* Foaming time: A relatively short period of time will be sufficient (in the experiment, it was one hour)

* Heating rate for foaming: Slow (in the experiment, it was 10°C/min.; high speed results in cracking of the solidified body)" ([0031])

(ix) "As explained in detail above, this invention enables obtainment of a porous glass with closed pores that has a predetermined density, compressive strength and thermal conductivity and is light and water floatable by obtaining a solidified body by the implementation of hydrothermal treatment using only water vapor to various waste glasses used as raw materials inside the autoclave and cooling to room temperature after keeping them for a certain period of time and then foaming this solidified body by heating it for a predetermined period of time inside a heating furnace. In particular, in this invention, it is unnecessary to add materials other than glass such as clay as the binding agent or limestone, etc. as the foaming agent, which are necessary for a conventional madreporic body that uses glass as raw material, and that alkaline solution, acid solution and urea, etc. are not used either. Therefore, the manufacturing cost may be reduced in connection with the reduced energy consumption of the heating furnace." ([0032])

(x) "Furthermore, since raw materials used in this invention are various kinds of waste glass, it is unnecessary to use products of nature as raw materials as in the case of a conventional hollow glass sphere, and thus there will be no limitations in terms of selecting and securing raw materials. In addition, since the foaming phenomenon generated by the heating furnace after the molding under hydrothermal conditions occurs in a uniform manner, the porous glasses will have uniform quality and will be light and water floatable as a result of having many closed pores and thereby a high manufacturing yield can be maintained." ([0033])

(xi) "Accordingly, this invention provides a porous glass which is manufactured by only using various waste glasses as raw materials and implementing hydrothermal treatment using water vapor without the need to use binding agents and various chemicals that were necessary in the past and which has a uniform quality and water floatability as a result of the uniform foaming phenomenon with reduced manufacturing cost, as well as a manufacturing method of such porous glass." ([0034])

B. Contents and Characteristics of the Claimed Invention

Summarizing what is stated in 1.(5) and 2.(2)A. above, the Description states the following three methods as the "scope of claims": (i) a method to manufacture a madreporic body and

hollow glass sphere by heating and foaming the glass after processing the glass under hydrothermal conditions and dispersing water inside the glass; (ii) a method to prepare porous glass by the steps of adding water to glass powder, applying pressure to them, molding them under hydrothermal conditions and foaming the molded body by heating; and (iii) a method to manufacture a hollow glass sphere by heating and foaming the glass powder which has been processed in high temperature water vapor. The Description also states the problems and method to solve them as follows: (i) a madreporic body can be prepared only from glass; (ii) the pores of the madreporic body are closed and the madreporic body can float on water; (iii) waste glass can be used as raw material; and (iv) the manufacturing yield of the hollow glass sphere is high thanks to the uniform synthesis of raw materials realized by the implementation of hydrothermal treatment. The characteristic parts of the Claimed Invention can be found in the discovery of a useful effect such that porous glass with closed pores and water floatability obtained by uniform foaming phenomenon can be manufactured by only using waste glass and other glasses and reacting them under hydrothermal conditions with the use of hydrothermal hot pressing method by setting the pressure to be applied to the kneaded material consisting of glass powder and water to be 10MPa or more, the heating temperature to be 750°C or higher, and the temperature rising rate and temperature falling rate to be 1°C /min.

(In this regard, the Defendant alleged that the invention stated in Claim 1 related to pressureless foaming and that the "discovery of the fact that porous glass which is characterized by being prepared so as to have closed pores inside by dispersing water inside the glass with the implementation of the hydrothermal treatment to the glass and water without using the hydrothermal hot pressing method and then foaming them by heating" should be included in the characteristic parts of the invention. However, the fact that the invention stated in Claim 1 relates to a pressure foaming is as stated in line 3 of page 30 to line 7 of page 31 of the judgment in prior instance and thus this part will be quoted. The Defendant's allegation in this regard cannot be accepted.)

C. Comparison between the Porosification Technology in Question Stated in the Third Report and the Claimed Invention

The porosification technology in question ("Porosification Technology") stated in the Third Report only shows that a porous phenomenon was confirmed under certain conditions, i.e. reheating at 750°C for an hour, while the problems of "water floatability" and "closed pores," which are among the characteristic parts of the technical idea of the Claimed Invention, as well as the method to solve them have not been confirmed.

In this regard, according to the fact that the Third Report contains no statements regarding closed pores and that one lump of foam contained an approximately same amount of open pores and closed pores (open pores: 52.01%, closed pores: 47.99%) as a result of measuring it by

pycnometer (Exhibits Otsu 58-1 and 105), it can be found that there was no recognition on closed pores at the time when the Third Report was prepared. On the other hand, the Plaintiff's written opinion (Exhibit Ko 74) contains a statement that "It is common knowledge to consider that the pores will be closed." Yet, according to Exhibit Otsu 105, this statement can be found to have referred to the case where bubbles are generated in complete liquid and it cannot be found that the pores are closed from the SEM pictures attached to the Third Report. The Plaintiff further uses as the grounds for his/her allegations that the pores are explained to be closed in the same picture as the SEM picture showing the cross sectional surface of the porous glass used in the Third Report, which has also been published in the academic paper titled "Recycling of Waste Glass by Hydrothermal Hot Pressing Method and Creation of Porous Glass" (Exhibit Otsu 12), as well as in M's Master's Thesis (Exhibit Otsu 2-1) and Doctoral Thesis (Exhibit Ko 40) prepared by M. However, this does not affect the abovementioned findings that it was unclear as to whether the pores are closed from the attached SEM pictures at the time when the Third Report was prepared.

As found above, the Porosification Technology stated in the Third Report cannot be found to have disclosed the knowledge verified by experiments, etc. concerning the following "hydrothermal conditions, etc. that are preferable for working this invention" stated in the Description: the type of glass powder, quantity of water to be added, molding pressure and temperature, low heating rate and cooling rate for molding, foaming temperature, foaming time, and low heating rate for foaming.

When the Porosification Technology stated in the Third Report and the Claimed Invention are compared, the Porosification Technology stated in the Third Report can indeed be found as follows: (i) it does not contain Claims 3 through 6; but (ii) it contains Claims 1 and 2 (the Defendant does not dispute that the inventions stated in Claims 2, 5 and 6 are identical to the technical information disclosed in the Third Report).

However, in the chemical field, mere discovery of a unique phenomenon does not immediately lead to an understanding that the relevant technical idea is available as being concrete and objective enough to enable a person ordinarily skilled in the art to work it. In addition, taking into account that there may be cases where investigation is required for confirming the reproducibility and effect, etc., even if the Porosification Technology stated in the Third Report contains Claims 1 and 2, it cannot be found to have reached a level where a technical idea concrete and objective enough for a person ordinarily skilled in the art to work can be confirmed at the time when the porous phenomenon was confirmed in the Third Report.

Accordingly, even if the Plaintiff had made any contributions to the discovery of the Porosification Technology in the Third Report by M, this fact does not immediately serve as the grounds to find that the Plaintiff is the inventor of the Claimed Invention.

(3) Inventor of the Claimed Invention

According to the facts found in 1. and 2.(2) above, it is obvious that the Claimed Invention originated in the discovery of porous phenomenon by M when she heated the glass to 750°C by using a platinum crucible and that M prepared the Master's Thesis based on the results of the repeated experiments, which she conducted by changing the conditions for hydrothermal hot pressing while receiving instructions from the Defendant, in order to find and verify the effect and usefulness of the porous phenomenon mentioned above, and through which she found the conditions for usefulness.

When the Claimed Invention and the contents of the Master's Thesis identified in 1. above are compared, it is found that the Master's Thesis includes the characteristic parts of the technical ideas of every Claim of the Claimed Invention. Thus, it may be found that the Claimed Invention had acquired a structure concrete and objective enough to enable a person ordinarily skilled in the art to reproduce the invention and achieve the intended technical effect, i.e. the Claimed Invention was completed by the time M prepared the Master's Thesis at the latest.

The Plaintiff alleges that M merely assisted the Plaintiff's research activities and did not have the capacity to execute the experiments related to the Claimed Invention, and a statement to that effect is also contained in the Plaintiff's written statement (Exhibits Ko 20, 29 and 30). However, in light of M's career, i.e. career of serving as a lecturer and researcher in Colombia, and research student and trainee after coming to Japan, it can be found that M had the expertise and experience of experiments not only in inorganic chemistry such as glass and ceramics but also in chemistry in general including organic chemistry and thus had sufficient research skills. In addition, even if M had poor knowledge in the hydrothermal field at the time when the research was started, it was not difficult for M to acquire by herself expertise on the hydrothermal field. Accordingly, it cannot be said that M is not the inventor of the Claimed Invention based on M's status at the time when the research was started. In addition, at that time, M was carrying out the experiments in question ("Experiments") along with the preparation of her master's thesis. However, as found in 1. above, preparation of the master's thesis was hardly proceeding and M had changed the theme after consulting with the Defendant. Thus, it can be easily presumed that M was spending a considerable time and effort on the Experiments and thus, the abovementioned facts cannot serve as the basis to find that M is not the inventor.

(4) The Plaintiff's Involvement in the Creation of the Claimed Invention

According to the facts found in 1. and 2.(2) above, the specific contents of the guidance, explanation and instructions given to M by the Plaintiff are as follows: (i) general explanation on the field of hydrothermal chemistry or hydrothermal hot pressing method and an explanation of the process of the experiments to be conducted in the Joint Research; (ii) instructions to conduct the DTA analysis; and (iii) instructions to take SEM pictures after the discovery of the

porous phenomenon. As found above, the explanation and instructions mentioned in (i) and (ii) above are not directly related to the Claimed Invention while the instructions mentioned in (iii) above remain to be general ones. As such, the Plaintiff had only received reports on the results of the experiments from M in the process that led to the creation of the Claimed Invention and did not find the usefulness of the Claimed Invention nor did he/she contribute to the act of acquiring a structure concrete and objective enough to enable a person ordinarily skilled in the art to reproduce the invention and achieve the intended technical effect. The Plaintiff only gave M general advice and guidance as a manager and thus cannot be found to be the inventor of the Claimed Invention.

In relation to the abovementioned points, the Plaintiff alleged as follows. However, all of the allegations are groundless.

A. The Plaintiff alleged that as long as the Claimed Invention was created in the process of the Joint Research, the Plaintiff is the inventor.

However, according to the facts found in 1. and 2.(2) above, the object of the Joint Research is to "develop technology to solidify pulverized materials of glass bottles at low temperature," which is, in short, a technology to solidify pulverized materials of glass including waste glass at low temperature for the purpose of recycling and differs from the manufacture of porous glass that can be obtained by reheating a glass solidified body. In other words, the discovery of the porous glass by M is different from the object and contents of the Joint Research and the act of giving a concrete form to such discovery and completing it as an invention is beyond the scope of the object of the Joint Research. Thus, the abovementioned Plaintiff's allegation cannot be accepted.

B. The Plaintiff alleged that, since he/she instructed M to conduct reheating at 750°C by using a platinum crucible, he/she is the inventor. Moreover, the Plaintiff's written statement (Exhibit Ko 29) contains the following statements; (i) "While weight loss was shown in a prosy manner within the range of 100°C to 250°C, based on the facts that a large quantity of water remained in the glass at the temperature of 250°C and that measurement at high temperature was impossible due to the breakdown of the thermal analysis equipment, I instructed M to carry out calcinations using a platinum crucible. Since Y was in charge of managing platinum crucibles, I instructed Y to offer a platinum crucible while instructing M to conduct calcinations at high temperature by using such platinum crucible and observe any changes that occur in association with the rise in the temperature."; and (ii) "Since thermal analysis at a temperature of 500°C or higher could not be sufficiently used in relation to a solidified body with insufficient strength, based on the fact that, if the weight of the glass is quickly measured each time by using a platinum crucible, separately preparing a furnace and gradually elevating the temperature, rough information is available as a substitute for the thermobalance up to a high temperature, I instructed M to carry

out the experiment by using the platinum crucible."

However, the contents of the abovementioned written statement contain many parts that are unreliable and thus the Plaintiff's allegations mentioned above cannot be accepted.

(A) According to the evidence (Exhibit Otsu 36), the DTA method is a test method where the temperature continuously elevates and the TG-DTA equipment in which temperature can elevate to 1000°C or higher can be used. However, since solidified glass melts at high temperatures, a porous phenomenon cannot be observed by the DTA method and thus it cannot be construed that the Plaintiff's instruction concerning the DTA method led to the creation of the Claimed Invention.

(B) The Plaintiff stated that the platinum crucible was considerably large with a height of 5 to 10 centimeters in his examination. However, as found in 1 above, the platinum crucible used by M was the smaller one of the two types, and according to the evidence (Exhibits Otsu 31 and 32), the smaller platinum crucible had a height of about 3 cm and weighed about 22.6g and thus the Plaintiff's statement mentioned above is against the fact.

(C) The Plaintiff explained in his/her written statement (Exhibit Ko 29) that the breakdown of the DTA equipment was the reason for using the platinum crucible. However, as explained in (A) above, a porous phenomenon could not be observed by the DTA method and since no circumstances could be found to support the breakdown of the DTA equipment other than the Plaintiff's statement mentioned above, the abovementioned statement cannot be accepted. In addition, the Plaintiff stated that he/she instructed M to observe any changes that occur while gradually elevating the temperature by using a platinum crucible. However, according to the evidence (Exhibits Ko 6-1 and 6-2 and Exhibit Otsu 22-4), the reheating conducted by M using a platinum crucible was carried out by setting two stages of temperature, i.e. one hour each at 700°C and 750°C, and this is inconsistent with the contents of the instruction alleged to be made by the Plaintiff such as the observance of changes by the gradual elevation of temperature.

(D) According to the evidence (Exhibits Otsu 34 and 36), when the TG-DTA equipment is used, if the temperature is to be elevated to 1000°C, a platinum container is used to contain specimen. However, since specimen that melts such as the glass in question has the risk of overflow from the container and damage to the equipment, testing using a platinum container at high temperature is inappropriate. In contrast, testing using a platinum crucible is appropriate for measuring the heat weight change of the specimen after heating the glass specimen in an electric furnace and taking it out from the furnace. As long as the characteristic parts of the technical idea of the Claimed Invention lie in the heating of solidified glass and causing of foaming action by the heating process by an electric furnace, the act of carrying out the experiment by using a platinum crucible led to the creation of the characteristic features of the technical idea of the Claimed Invention. In other words, heating by the DTA equipment and heating by the platinum

crucible are the same process in terms of heating the solidified glass, but the latter heating process caused the foaming phenomenon and realized porosification.

As such, according to all of the evidence submitted, the Plaintiff has instructed M to use the DTA but cannot be found to have instructed her to use a platinum crucible. Instead, as long as it is obvious that the Defendant advised M to use a platinum crucible (1. and 2.(2) above), the Plaintiff's allegation in this regard cannot be accepted.

C. The Plaintiff alleged that he/she found the significance and usefulness of the foam of glass. The Plaintiff's written statement (Exhibit Ko 29) and K's written statement (Exhibit Ko 53) contain statements in line with this allegation.

However, while the Plaintiff has stated that the shape of the foam of glass shown by M was "something like cotton but lighter and softer than cotton" (Exhibit Ko 20), the actual shape of the foam was different (Exhibit Otsu 3 and Object of Observation Otsu 2). Moreover, even if all of the evidence submitted is taken into consideration, the Plaintiff cannot be found to have conducted any act that had contributed to the achievement of a structure concrete and objective enough to enable a person ordinarily skilled in the art to reproduce the invention and achieve the intended technical effect, such as giving an instruction to carry out experiments to examine the conditions for the generation of foam of glass, after M's discovery thereof. Rather, although the Plaintiff had many experiences of being involved in the filing of patent applications (Exhibit Otsu 77), he/she failed to file a patent application by him/herself with respect to the Claimed Invention nor did he/she submit a notice of invention to Kochi University (results of the examination of the Plaintiff). In addition, as found in 1. above, there are no statements concerning porous phenomenon in the implementation report of the Joint Research (Exhibit Otsu 60) submitted to Kochi University. Furthermore, the Plaintiff has raised no objections to the presentation made by M at an international conference found in 1. above.

In this regard, the Plaintiff explained the reasons for not filing a patent application in the written response prepared by the Plaintiff (Exhibit Ko 20) and in the examination of the Plaintiff as follows: (i) The Plaintiff did not submit a notice of invention due to an understanding that, at that time, the management system of patents including search of infringement of patents and criminal complaints was, in general, extremely inadequate in universities including Kochi University; and (ii) since a patent would not be granted if the invention becomes publicly known, the Plaintiff did not state the invention in the report (Exhibits Otsu 60 and 61-1). However, the reason mentioned in (i) above is contradictory to the fact of not filing a patent application by the Plaintiff him/herself while the reason mentioned in (ii) above is also contradictory to the fact of not raising any objections to M's master's thesis or presentation at an international conference as mentioned above, and thus the Plaintiff's allegations based on these two reasons cannot be accepted.

Moreover, K's written statement mentioned above contains a statement that the Plaintiff visited Kankyo Hozen Service with M and explained the usefulness of the foam of glass. However, if there was such a fact, the Plaintiff should have instructed M to achieve a structure concrete and objective enough to enable a person ordinarily skilled in the art to reproduce the invention and achieve the intended technical effect by preparing a foam of glass and examining the conditions for such preparation, after he/she received a report of discovery of the porous phenomenon from M. Yet, as stated above, the Plaintiff cannot be found to have conducted any of such acts. Furthermore, the Plaintiff's written statement (Exhibits Ko 20 and 52-1) contains the Plaintiff's following understandings: (i) "I had deemed that experiments were almost completed for foam glass;" and (ii) "a visit to the company is equivalent to declaring that the joint research conducted with the company is completed." These statements are inconsistent with the statements in K's written statement mentioned above such that "he/she thought that the practical realization would be made in future." Accordingly, the abovementioned facts related to the Plaintiff's allegations cannot be found from the contents of statements made in the Plaintiff's written statement and K's written statement.

Putting the abovementioned determinations and facts together, it is appropriate to construe that the Plaintiff had not found the significance and usefulness of the porous glass at the time when it was shown by M or even after that time.

D. The Plaintiff alleged that there is a fact that the Plaintiff pointed out to M that the porous phenomenon has particularly important implications immediately after he/she received a report of discovery of the phenomenon from M and that this fact can be regarded as the Plaintiff's contribution to the creation of the Claimed Invention. In addition, in the results of the examination of the Plaintiff and the Plaintiff's written statement (Exhibit Ko 29), the Plaintiff has stated that, in the Third Report, "the statement which reads that 'This result is particularly important' as mentioned below with respect to this foaming phenomenon has been made based on the instructions of the Plaintiff."

However, according to the testimony by witness M and written response (Exhibit Otsu 1), this expression is a phrase frequently used by her and she wrote this statement based on her own decision. Actually, the expression "particularly" is used in several parts of the Doctoral Thesis prepared by M (Exhibit Ko 40). In addition, if the Plaintiff had an understanding that the porous phenomenon discovered by M is important, he/she would have had M carry out experiments to reproduce madreporic bodies. Yet, there are no facts showing that the Plaintiff instructed M to carry out such experiments and the Plaintiff's allegation mentioned above is inconsistent with the lack of any reference to the porous phenomenon in the report for the Joint Report (Exhibit Otsu 60) as found above. Thus, the Plaintiff's allegation in this regard cannot be accepted.

E. In addition, the Plaintiff's written statement (Exhibit Ko 29) contains a statement that the

Plaintiff instructed M to prepare 10 pieces of foam of glass. However, M has denied the abovementioned fact and there is no other evidence sufficient to affirm the Plaintiff's allegation. Thus, the abovementioned statements in the Plaintiff's written statement cannot be accepted.

Furthermore, with respect to the Plaintiff's instructions to M, the Plaintiff's written statements (Exhibits Ko 20 and 30) contain the following: "I instructed the experimental work of the day, orally listened to the results in each case and checked data each time, on a daily basis."

However, according to the testimony made by witness M, M has denied the fact of receiving such instructions. Moreover, in light of the following, it may be presumed that the Plaintiff was extremely busy at that time and thus it cannot be found that the Plaintiff made such individual and specific instructions as stated above for one research case under such a situation: (i) In the Plaintiff's written statement (Exhibit Ko 29), the Plaintiff has stated that "at that time, more than 10 cases of joint research with the private sector were simultaneously implemented and generally, I had to give instructions to persons directly dispatched to the research laboratory from the private sector;" and (ii) in T's written statement (Exhibit Otsu 69) and H's written statement (Exhibit Otsu 70), it is stated that the Plaintiff came to the Research Laboratory of Hydrothermal Chemistry once every several weeks or months. Thus, the abovementioned statements in Exhibits Ko 20 and 30 are not reliable.

(5) Summary

As found above, M and the Defendant are the inventors of the Claimed Invention and the Plaintiff is not the inventor of the Claimed Invention.

3. Regarding Issues 2 and 3 (whether or not the right of honor as an inventor or right of honor held by the Plaintiff has been infringed)

As found in 2. above, since the Plaintiff is not the inventor of the Claimed Invention, no tort can be found in the following Defendant's acts in relation to the Plaintiff: (i) the Defendant's act of assigning the right to obtain a patent to TN Shikoku and TN Shikoku's filing of a patent application; or (ii) the Defendant's act of applying for Subsidies for the Claimed Invention by stating that he/she created the invention. The Plaintiff's allegations are groundless.

4. Conclusion

As found above, the Plaintiff's allegations concerning Issues 1 through 3 are groundless and thus the Plaintiff's claim is groundless without the need for making determination on Issue 5 (with respect to Issue 4, the Defendant has no complaints and thus this issue is not subject to determination). Accordingly, the judgment in prior instance which partially upheld the Plaintiff's claim is inappropriate and the Appeal filed by the Defendant is well-grounded, and thus the judgment shall be rendered in the form of the main text.

Intellectual Property High Court, Third Division

Presiding judge: IIMURA Toshiaki

Judge: UEDA Hiroyuki

Signature and sign of Judge MIMURA Ryoichi could not be obtained due to schedule conflict.

Presiding Judge: IIMURA Toshiaki