

Appeal decision

Appeal No. 2019-691

Appellant	Sun Chemical Co. Ltd.
Patent Attorney	MURAYAMA, Yasuhiko
Patent Attorney	JITSUHIRO, Shinya
Patent Attorney	ABE, Tatsuhiko

The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2015-560266 entitled "POLYVINYL ALCOHOL AND ETHYLENE VINYL ALCOHOL COPOLYMER BARRIER COATINGS" (September 4, 2014, International Publication, WO 2014/134110; May 19, 2016, Domestic Publication, National Publication of International Patent Application No. 2016-51418) has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The present application was filed on February 26, 2014 as the international filing date (priority claim under the Paris Convention, received on February 27, 2013, by the foreign receiving office, U.S.A.), and an amendment was made on December 19, 2016, in response to the notice of reasons for refusal dated November 20, 2017, an amendment was made on April 17, 2018 and a written opinion was submitted on the same day,

in response to the examiner's decision of refusal dated September 26, 2018, an amendment was made on January 18, 2019 simultaneously with a demand for appeal, and, subsequently, a written statement was filed on April 17, 2019, and

in response to the notice of reasons for refusal dated October 23, 2019 (hereinafter, referred to as "the previous notice of reasons for refusal"), a written opinion dated January 9, 2020 (hereinafter, referred to as "the second written opinion") was filed and

an amendment (hereinafter, referred to as "the fourth amendment") was made simultaneously.

No. 2 The Invention

The application of the case is entitled "POLYVINYL ALCOHOL AND ETHYLENE VINYL ALCOHOL COPOLYMER BARRIER COATINGS" and matters described in Claims 1 to 19 as amended by the fourth amendment are as follows:

"[Claim 1] A barrier coating composition comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture one or more organic solvents, wherein

the composition has a solid content higher than 7.5% by weight but not higher than 10% by weight, and,

the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2 mPa.s or higher but below 4 mPa.s in an aqueous solution at 20 °C with 4% solid content.

[Claim 2] The barrier coating composition of Claim 1, wherein the organic solvent is a monohydric alcohol with a carbon number C1 to C4 comprising a hydroxyl group.

[Claim 3] The barrier coating composition of Claim 1, wherein the organic solvent is selected from the group consisting of tetrahydrofuran, 1, 3-dioxaslane, acetonitrile, ethyl acetate, n-propyl acetate, isopropyl acetate, acetone, methyl ethyl ketone (MEK), cyclohexanone, isophorone, hexane, heptane, toluene, ethylene glycol, alkyl cellosolves, and diglycerol dimethyl ether (DGME).

[Claim 4] The barrier coating composition of Claim 1, further comprising a filler and/or extender pigment.

[Claim 5] The barrier coating composition of Claim 1, functioning as a barrier against a gas and/or nuisance substances.

[Claim 6] The barrier coating composition of Claim 1, wherein the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a molecular weight distribution of 5000 Daltons or more, but below 16,000 Daltons.

[Claim 7] The barrier coating composition of Claim 1, wherein said polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2 mPa.s or more but less than 3 mPa.s in a 20 °C aqueous solution at 4% solid content.

[Claim 8] The barrier coating composition of Claim 1, wherein said poly vinyl alcohol or ethylene vinyl alcohol co-polymer has a degree of hydrolysis of at least 95%.

[Claim 9] The barrier coating composition of any one of the preceding claims, being stable for more than 14 days.

[Claim 10] The barrier coating composition of Claim 9, having a coating viscosity

of 15 seconds or more but less than 30 seconds (Zahn cup #2 flow time) at 23°C.

[Claim 11] The barrier coating composition of any one of Claims 1 to 10, wherein, if coated as wet coated film, the composition follows the rule: $wfm \div \% NVC \times \eta \leq 12$ (wherein, wfm is weight of wet coated film (g/m²); %NVC is % by weight of dry polymer content in above barrier coating composition; and, η is the viscosity of the coating expressed in (Zahn cup #2 flow time) seconds at 23 °C).

[Claim 12] A method of making a coating that forms a barrier against gas and/or nuisance substances, comprising dissolving a polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture of one or several types of organic solvents, wherein

the coating has a solid content greater than 7.5% by weight but not exceeding 10% by weight, and

the co-polymer of polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer has a viscosity of 2.2 mPa.s or more but below 4 mPa.s in 20 °C aqueous solution at 4% solid content.

[Claim 13] The method of Claim 12, wherein the organic solvent is a monohydric alcohol with a carbon number C1 to C4 comprising a hydroxyl group.

[Claim 14] The method of Claim 12, further comprising adding to the aqueous mixture a filler and/or extender pigment with an aspect ratio greater than 20.

[Claim 15] A method of coating an article with a barrier against gas and nuisance substances comprising printing the barrier coating composition of any one of Claims 1-11 on the article.

[Claim 16] The method of Claim 15, wherein the barrier coating composition is printed in-line with a printing ink.

[Claim 17] The method of Claim 15, wherein the article comprises either a mono web surface printed or a laminate reverse printed structure.

[Claim 18] An article coated with the barrier coating composition of any one of Claims 1 to 11.

[Claim 19] The article of Claim 18, acting as a barrier against gas and/or nuisance substances."

The unit used in above claim 1, etc. "mPa.s" is understood to be substantially same as the unit "mPa.s."

No. 3 Overview of notice of reasons for refusal dated October 23, 2019

The previous notice of reasons for refusal indicates the following reasons as

Reasons 1 to 4.

Reason 1: Since the inventions according to Claims 1 to 20 of the present application are inventions described in the following Publication 1 distributed in Japan or abroad before the application was filed, they fall under Article 29(1)(iii) of the Patent Act and the Appellant should not be granted a patent for the inventions.

Reason 2: Since the inventions according to Claims 1 to 20 of the present application are inventions that could have been easily made by a person who had ordinary skill in the art belonging to the Invention before the priority date, based on the invention described in the following Publications 1 to 3 distributed in Japan or abroad before the application was filed, the Appellant should not be granted a patent for the inventions under the provisions of Article 29(2) of the Patent Act.

Reason 3: Since the descriptions in the detailed description of the invention are deficient in the following points, the present application does not satisfy the requirement set forth in Article 36(4)(i) of the Patent Act.

Reason 4: Since the descriptions in the claims are deficient in the following points, the present application does not comply with Article 36(6)(i) and (ii) of the Patent Act and does not satisfy the requirement set forth in Article 36(6) of the Patent Act.

In the notice of reasons for refusal, the following points (1) to (4) are pointed out as deficiencies in the description, and, in addition, the following Publications 1 to 3 are indicated as Cited Publications.

1. Reasons 3 and 4

(1) With respect to recitation in Claim 6 of the present application, "a molecular weight distribution of ... below 16,000 Daltons," since Dalton is an atomic mass unit, but not a unit to express molecular weight distribution, the meaning of the above description is not clear and the description does not comply with Article 36(6)(ii) of the Patent Act.

(2) Since "product specified by a function, characteristics, etc." in Claims 10 and 11 of the present application cannot be deemed such that the inventions can be worked without "trial and error exceeding the level normally expectable for a person skilled in the art, complicated or high level of experimentation, etc.," it does not comply with Article 36(4)(i) of the Patent Act.

(3) "Examples 2A, 2B, and 2C" of paragraph 0063 of the present specification do not describe the detail of "solutioning techniques outlined by the manufacturer" so that the

invention can be worked, and the invention does not comply with Article 36(4)(i) of the Patent Act.

(4) With respect to the wide range of "at least 45%" in Claims 1 and 13 of the present application and a wide range of options for "organic solvents" numerated in Claims 2 to 3 and 14 of the present application, since it cannot be deemed that the detailed description of the invention describes the "technological implication of the relationship between the ranges and obtained effects" so that it can be understood that the ranges are not "mere speculation" but "understandable for a person skilled in the art even without disclosure of any concrete example" or "recognizable by referring to common general technical knowledge as of the time of filing the application," descriptions in Claims 1 to 20 of the present application do not comply with Article 36(6)(i) of the Patent Act.

2. Reasons 1 and 2

Publication 1: Japanese Unexamined Patent Application Publication No. 2011-511863

Publication 2: International Publication No. WO 2013/001313

Publication 3: Japanese Unexamined Patent Application Publication No. 2006-282947

No. 4 Judgment by the body

1. Reasons 3 and 4

(1) Descriptions in the specification of the present application

The detailed description of the invention in the specification of the present application as amended by the fourth amendment has the following descriptions.

" [Problem to be solved by the invention]

[0015] In summary, none of the prior art described above discloses (gas) barrier coatings comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymers dissolved in aqueous mixtures that contain at least 45% organic solvents such as lower alcohols.

[Means for solving the problem]

[0016] The present invention provides a barrier coating composition comprising a polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in an aqueous mixture that comprises at least 45% one or more organic solvents. ...

[Description of Embodiments]

[0022] PVOH and EVOH co-polymers are available at varying molecular weights,

but there are very few with MWs less than about 10,000 or aqueous solution viscosities less than 3mPa.s at 4% concentration (industry standard way of specifying PVOH viscosity grade). Such polymers not surprisingly show lower viscosity at a given solid content, but quite surprisingly tolerate dilution with significantly higher levels of organic solvents – such as lower alcohols – up to and often beyond 50%. ...

[0024] Careful selection of commercially available polymers has led to the finding that aqueous solutions preferably containing 45% or more organic solvents such as lower alcohols (e.g. ethanol, Industrial Methylated Spirits (IMS, TSDA etc.), 1-propanol, 2-propanol, etc.) can be made, preferably by using PVOH and/or EVOH with a molecular weight less than 10,000. ...

[0027] These high organic solvent/water solutions dry more than twice as fast than the conventional grades available, owing to the higher polymer solids that can be achieved at the same application viscosity whilst allowing a reduction in wet film thickness that contains the higher, more volatile organic solvent diluent, resulting in faster drying without compromising other performance characteristics.

[0028] Accordingly, the present invention relates to barrier coatings, particularly having the ability to block the ingress of gases (e.g. oxygen, carbon dioxide, other gases and aromas) and which may be used to coat and impart barrier properties to a variety of materials required to avoid or limit exposure to oxygen or nuisance substances, notably to coat package of foods and pharmaceuticals. ...

[0045] The Invention and working examples demonstrate that barrier properties with and without filler can be achieved where a PVOH or EVOH co-polymer is with an ethylene content preferably below 25mol%, more preferably below 20mol%, and most preferably below 15mol%, and the viscosity of 4% aqueous solution at 20°C by Brookfield synchronous motor rotating viscosimeter is preferably below 4.0mPa.s, more preferably below 3.0mPa.s, and most preferably below 2.5mPa.s. The present invention depends on PVOH or EVOH having a molecular weight distribution of below preferably 16000Da (Daltons), more preferably below 12000Da, and most preferably below 7000Da. ...

[Examples]

[0049] Test Methods:

% Non Volatile Content (% NVC)

The test involves weighing approximately 1g of a coating into a petri dish, the actual weight being recorded to two decimal places. This is then placed in an electrically heated fan assisted oven for 30 minutes at 150°C. The sample is then cooled to room temperature and re-weighed. The % NVC is calculated as follows:

% NVC = final weight of dry coating (grams) / Initial weight of wet coating (grams) x 100 ...

[0058] The following examples illustrate specific aspects of the present invention and are not intended to limit the scope thereof in any respect and should not be so construed. Among the following examples, Examples 3, 6A, 7A to 7D, 8, 9, 10, 11A to 11D, 12A, and 12B are respectively reference examples.

[0059] Example 1:

Aquaseal (registered trademark) x2281 is a polyvinyl alcohol solution in water supplied by Paramelt B.V. Netherlands. The polymer solution is supplied at around 20 to 22% non-volatile content. Aquaseal (registered trademark) x2281 was further diluted in the laboratory with a mixture of Industrial Methylated Spirits (IMS*: also sold as TSDA) and water under mild agitation with a vortex stirrer (see Table 1).

[0060] [Table 1]

実施例 1	
Aquaseal X 2281	43.5
IMS*	50.8
脱イオン水	5.7
合計	100.0

IMS* = 2.2% 酢酸エチルと 0.1% 2-プロパノールで変性したエタノール

実施例 1 の配合 Composition of Example 1

実施例 1 Example 1

脱イオン水 Deionized water

合計 Total

2.2% 酢酸エチルと 0.1% 2-プロパノールで変性したエタノール
Ethanol denatured with 2.2% ethyl acetate and 0.1% 2-propanol

[0061] The following results were achieved as shown in Table 2.

[0062] [Table 2]

実施例 1 の特性

	実施例 1
粘度 (# 2 ザーンカップ@ 23 °C) 秒	23
%NVC	9.3
OTR 0/65%RH、4 gsm 未乾燥 (0.36~0.4 gsm 乾燥)	1.2 cc/m ² /日
乾燥速度 (ラボ試験) +/- 10 秒	50 秒 ± 5 秒
貯蔵安定性	> 14 日

実施例 1 の特性 Properties of Example 1

実施例 1 Example 1

粘度 (# 2 ザーンカップ@ 23 °C) 秒

Viscosity (Zahn cup #2 @ 23 °C) seconds

未乾燥 Wet

乾燥 Dry

1.2 cc/m²/日 1.2 cc/m²/day

乾燥速度 (ラボ試験) +/- 10 秒 Drying rate (laboratory test) +/- 10 sec

50 秒 ± 5 秒 50 sec ± 5 sec

貯蔵安定性 Storage stability

> 14 日 > 14 days

[0063] Examples 2A, 2B, and 2C

Mowiol® 2-97 is a polyvinyl alcohol resin supplied by Kuraray Specialties Europe. It has a molecular weight of approximately 5000 Daltons. The viscosity, specified by Kuraray, is 2.2 to 2.3 mPa.s as a 4% aqueous solution at 20°C. This polymer was made into the following solutions (see Table 3) using solutioning techniques outlined by the manufacturer and diluted with lower alcohols, including ethanol (IMS*), 2-propanol, and 1-propanol.

[0064] [Table 3]

実施例 2 A、2 B、及び 2 C の配合

	実施例 2 A	実施例 2 B	実施例 2 C
Mowiol 2-97 (20%水溶液)	50.0	50.0	50.0
IMS*	45.0	-	-
1-プロパノール	-	45.0	-
2-プロパノール	-	-	45.0
脱イオン水	5.0	5.0	5.0
合計	100.0	100.0	100.0

実施例 2 A、2 B、及び 2 C の配合
2C

Compositions of Example 2A, 2B, and 2C

(20%水溶液)	(20% aqueous solution)
実施例	Example
1-プロパノール	1-propanol
2-プロパノール	2-propanol
脱イオン水	Deionized water
合計	Total

[0065] The following results were achieved as indicated in Table 4

[0066] [Table 4]

	実施例 2 A	実施例 2 C
粘度 (# 2 ザーンカップ @ 23 °C) 秒	20	21
%NVC	10.1	10
OTR 0/65%RH、4 g s m 未乾燥 (0.36~0.4 g s m 乾 燥)	1.2 cc/m ² /日	1.4 cc/m ² / 日
乾燥速度 (ラボ試験) +/- 10 秒	45	51

実施例 2 A 及び 2 C の特性

Properties of Example 2A and 2C

実施例 Example

粘度 (# 2 ザーンカップ @ 23 °C) 秒

Viscosity (Zahn cup #2 @ 23 °C) seconds

未乾燥 Wet

乾燥 Dry

1.2 cc/m²/日 1.2 cc/m²/day

1.4 cc/m²/日 1.4 cc/m²/day

乾燥速度 (ラボ試験) +/- 10 秒"

Drying rate (laboratory test) +/- 10 sec

"

(2) Above No. 3, "1, (1)"

With respect to the description, "a molecular weight distribution of below 16,000

Daltons" of Claim 6 of the present application, the Appellee alleges in the second written opinion, page 3 that "(5) 'molecular weight distribution' in Claim 6 before the amendment is changed to 'molecular weight' by the present amendment. We believe that the invention according to Claim 6 after amendment became clear by this amendment."

However, while the description in Claim 6 after the amendment by the fourth amendment is as described in above "No. 2 The Invention," since the description, "molecular weight distribution" before the amendment is not amended to "molecular weight," with respect to the description in Claim 6 of the present application "molecular weight distribution below 16,000 Daltons" still remains not clear, because Dalton is an atomic mass unit and not any unit for expressing molecular weight distribution.

Accordingly, with respect to descriptions in Claim 6 of the present application and its dependent claims, since the invention for which a patent is sought is not clear, they do not comply with Article 36(6)(ii) of the Patent Act.

(3) Above No. 3, "1, (2)"

The invention according to Claim 10 of the present application relates to an invention of an product, "a barrier coating composition," specified with "function, characteristics, etc.," that has a coating viscosity of 15 seconds or more and less than 30 seconds (Zahn cup #2 flow time) at 23°C."

The invention according to Claim 11 of the present application relates to an invention of a product, "a barrier coating composition," specified with "function, characteristics, etc.," "if coated as wet coated film, the co-polymer follows the rule: $wfm \div \% NVC \times \eta \leq 12$ (wherein, wfm is above weight of wet coated film (g/m²); %NVC is % by weight of dry polymer content in above barrier coating composition; and, η is the viscosity of the coating expressed in (Zahn cup #2 flow time) seconds at 23 °C)."

Generally speaking, "in technical fields in which it is difficult to predict structure, etc. of an product from functions, properties, etc. of the object, among product specified by a function, characteristics, etc., if it cannot be understood by a person skilled in the art even after taking into consideration descriptions in the specification and drawings as well as common general technical knowledge at the time of filing the application, how any product other than products of which manufacturing method is concretely described in the detailed description of the invention and products that can be manufactured from such product by taking common general technical knowledge into consideration (for example, cases in which trial and error exceeding the level normally expectable for a person skilled in the art, complicated or high level of experimentation, etc., for manufacturing such product), a violation of the enablement requirement is constituted," but with respect to

the enablement requirement for the inventions according to Claims 10 to 11 of the present application, the second written opinion clarified on page 3, (8) and (9) concerning clarity, but no specific clarification has been made with respect to the enablement requirement.

Even if all descriptions in the detailed description of the invention, including the description, "It is preferred that the barrier coating composition of the present invention has ... a coating viscosity of less than 30 seconds (Zahn cup #2 flow time) at 23°C" in paragraph 0046 of the present specification, and the description, "it is a preferred embodiment of the Invention that the co-polymer follows the rule: $w_{fm} \div \% NVC \times \eta \leq 12$ " in paragraph 0047 of the specification of the present application are carefully examined, no description of mechanism of or guideline for what conditions for manufacturing enable us to obtain a barrier coating composition that satisfies the condition that the value of "coating viscosity" of claim 10 and "rule" of Claim 11 of the present application, and "common general technical knowledge" at the time of filing the application that enables us to deem the "products specified by a function, characteristics, etc." can be manufactured even without descriptions on the above mechanism cannot be found to exist.

Therefore, among "products specified by a function, characteristics, etc." of Claims 10 and 11 of the present application, for products other than those of the working examples whose manufacturing method is concretely described in the detailed description of the invention, since no "descriptions in the specification and drawings" and "common general technical knowledge as of the time of filing the application" that allows working of the invention without trial and error exceeding the level normally expectable for a person skilled in the art, or complicated or high level of experiment, etc., exist, the description in the detailed description of the invention in the specification of the present application cannot be deemed to comply with the enablement requirement.

Accordingly, since the detailed description of the invention in the specification of the present application cannot be deemed to have been described sufficiently clearly and completely so that a person skilled in the art can work the inventions according to Claims 10 and 11 of the present application and their dependent claims, it does not comply with the provisions of Article 36(4)(i) of the Patent Act.

(4) Above No. 3, "1, (3)"

With respect to "Examples 2A, 2B, and 2C" in paragraph 0063 of the specification of the present application, while descriptions are not such that allow one to work the invention because the content of "solutioning techniques outlined by the manufacturer" is not clear, it is alleged in this regard in the second written opinion, pages 3 to 4 that

"(11) ... the solutioning techniques of Examples 2A to 2C are irrelevant to the definition of the Invention, and, at the same time, it means that dissolution was carried out by a method well known to a person skilled in the art, and any person skilled in the art can easily understand that the solutioning technique is one unique to the Invention. Accordingly, the detailed description of the invention after the amendment is sufficiently clear and complete so that a person skilled in the art can work the invention according to each claim of the present application."

However, since the invention according to Claim 1 of the present application has the matters specifying the invention, "comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in an aqueous mixture that comprises 45% to 94.4% one or more organic solvents," for example, water-soluble polymers, "polyvinyl alcohol (PVOH) and/or ethylene vinyl alcohol (EVOH)" must be dissolved in an aqueous mixture comprising 94.4% hexane. Therefore, above allegation that "solutioning techniques" is "irrelevant to definition of the Invention" is not understandable.

In addition, taking into consideration the description in paragraph 0015 of the specification of the present application "none of the prior art described above discloses (gas) barrier coatings comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in aqueous mixtures that contain at least 45% organic solvents such as lower alcohols," and description in paragraph 0022, "PVOH and EVOH co-polymers are available at varying molecular weights, but there are very few with MWs less than 10,000 or aqueous solution viscosities less than 3mPa.s at 4% concentration (industry standard way of specifying PVOH viscosity grade). Such polymers not surprisingly show lower viscosity at a given solid contents, but quite surprisingly tolerate dilution with significantly higher levels of organic solvents such as lower alcohols – up to and often beyond 50%," there is no reasonable reason or specific ground to understand that the technique to dissolve "polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer" in an aqueous mixture comprising 94.4% at the maximum of organic solvents (especially, organic solvents such as "isophorone" and "toluene" numerated in Claim 3 of the present application) is a "well known method" for a person skilled in the art.

Because of this, since the details of know-how of above "solutioning techniques outlined by the manufacturer" are not disclosed sufficiently clearly and completely, it cannot be deemed that "the invention of product" described in Claim 1 of the present application, "a barrier coating composition" "comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture one or more organic solvents," and "the invention of process" described in Claim 12 of the present application "A method of making a

coating" "comprising dissolving a polyvinyl alcohol and/or ethylene vinyl alcohol copolymer in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture of one or several types of organic solvents" can be easily worked by a person skilled in the art with the description in the detailed description of the invention in the specification of the present application.

Accordingly, since the detailed description of the invention in the specification of the present application cannot be deemed to have been described sufficiently clearly and completely so that a person skilled in the art can work inventions according to Claim 1 of the present application and its dependent claims, it does not comply with Article 36(4)(i) of the Patent Act.

(5) Above No. 3, "1, (4)"

A. Generally, "whether the descriptions in the claims comply with the support requirement for the specification should be judged by comparing the description in the claims with the descriptions in the detailed description of the invention and judging whether the invention described in the claim is an invention described in the detailed description of the invention, whether a person skilled in the art can recognize that the problem to be solved by the invention can be solved with the description in the detailed description of the invention, and whether a person skilled in the art can recognize that the problem to be solved by the invention can be solved in the light of common general technical knowledge at the time of filing the application even without such description or suggestion, and it is reasonable to understand that the applicant is responsible for proving that the specification satisfies the support requirement. ... As a matter of course, it contains a purport that it must be made clear that the range indicated by the formula is not merely a matter of speculation but it is supported by results of experiments." [See court decision of Heisei 17 (Gyo-Ke) No. 10042].

B. Judging from all descriptions in the detailed description of the invention including the description in paragraph 0028 of the specification of the present application, it is understood that the problem to be solved by the inventions according to Claims 1 to 20 of the present application is "provision of a barrier coating that is capable of inhibiting ingress of gas and nuisance substances, and, when used in coating of packages for foodstuffs and pharmaceutical products, can impart barrier properties."

C. The specification of the present application describes in paragraphs 0059 to 0062 a composition comprising a 43.5% aqueous solution of polyvinyl alcohol having a

commercial name, "Aquaseal (registered trademark) x2281 supplied with 20 to 22% of non-volatile content and 50.8% IMS (ethanol denatured with 2.2% ethyl acetate and 0.1% 2-propanol) and 5.7% deionized water as "Example 1." Assuming that the above non-volatile content is 20%, the ratio of "water" in the composition of Example 1 is calculated as follows: the amount of water contained in PVOH aqueous solution called the "Aquaseal (registered trademark) X2281" is $43.5 \times 0.8 = 34.8\%$. Adding 5.7% of deionized water to this, $34.8 + 5.7 = 40.5\%$ in total is used, and the total volume of organic solvents (IMS) in this "water" and "IMS" is $50.8 / (40.5 + 50.8) \times 100 = 55.6\%$ (Since the viscosity when PVHO solid content is 4% is unknown, Example 1 does not fall under any working example).

D. In addition, the specification of the present application describes in paragraphs 0063 to 0066 a composition comprising 50.0% aqueous solution of PVOH having a commercial name, "Mowiol (registered trademark) 2-97" supplied as 20% aqueous solution and 45.0% 2-propanol and 5.0% deionized water as "Example 2C." The ratio of "water" in the composition of Example 2C is calculated as follows: the amount of water contained in PVOH aqueous solution called the "Mowiol (registered trademark) 2-97" is $50.0 \times 0.8 = 40.0$. Adding 5.0% of deionized water to this, $40.0 + 5.0 = 45.0\%$ in total is used. The total volume of organic solvents (2-propanol) in this "water" and "2-propanol" is $45.0 / (45.0 + 45.0) = 50.0\%$ (Since the value of solid contents (%NVC) is not within the range of the Invention in Examples 2A and 2B, they do not fall under any working example of the Invention).

E. In this regard, it is alleged in the second written opinion, page 4, that "(12) by the present amendment, "at least 45%" described in Claims 1 and 3 before the amendment was restricted to "45% to 94.4% based on the aqueous mixture," and the solid content was restricted to "7.5% by weight but below 10% by weight," and the viscosity was restricted to "in a 20°C aqueous solution at 4% solid content, 2.2mPa.s or higher but below 4 mPa.s." "By these amendments, the Invention after the amendment was restricted from one described in the detailed description of the invention to the scope in which a person skilled in the art can infer the effect; namely, the scope to which expansion or generalization is allowed."

F. However, with respect to a wide numerical range, "an aqueous mixture that comprises 45% to 94.4% of one or more organic solvents based on the aqueous mixture" described in Claims 1 and 12 after the amendment, since concrete examples of Example 1 to 2C in

the specification of the present application merely support the range of "50 to 55.6%," even if all descriptions in the detailed description of the invention including the description, "quite surprisingly tolerate to dilution with significantly higher levels of organic solvents – such as lower alcohols – up to and often beyond 50%" in paragraph 0022 of the specification of the present application, and common general technical knowledge at the time of filing the patent application are taken into consideration, it cannot be deemed that an invention for which a patent is sought can be expanded or generalized to the upper limit, 94.4%.

G. In addition, even if the description of "action mechanism" in paragraph 0027 of the specification of the present application, "These high organic solvent/water solutions dry more than twice as fast than the conventional grades available owing to the higher polymer solids that can be achieved at the same application viscosity whilst allowing a reduction in wet film thickness that contains the higher, more volatile organic solvent diluent, resulting in faster drying without compromising other performance characteristics" is taken into consideration, since no "test result," "action mechanism," or "common general technical knowledge" has been found that can be deemed to show that each of organic solvents such as isophorone (boiling point = 215°C) and toluene (boiling point = 111°C) numerated in the description in Claim 3 after the amendment, "the organic solvent is selected from a group consisting of tetrahydrofuran, 1, 3-dioxalane, acetonitrile, ethyl acetate, n-propyl acetate, isopropyl acetate, acetone, methyl ethyl ketone (MEK), cyclohexanone, isophorone, hexane, heptane, toluene, ethylene glycol, alkyl cellosolves, and diglycerol dimethyl ether (DGME)" exhibits a similar degree of usefulness (performances such as solubility and volatility) to those organic solvents used in Example 2C such as 2-propanol (boiling point = 82°C), an invention for which a patent is sought cannot be expanded or generalized to the whole range of "organic solvents" in Claim 1 of the present application including "organic solvents" numerated in Claim 3 of the present application.

H. Accordingly, since inventions recited in Claims 1 and 12 of the present application and their dependent claims cannot be acknowledge to be the inventions described in the detailed description of the invention and to be recognizable by a person skilled in the art as being in the scope for solving the problem to be solved by the invention on the basis of the detailed description of the invention, and also it cannot be acknowledged that a person skilled in the art can recognize that the problem to be solved by the invention can be solved in the light of common general technical knowledge as of the date of filing the

application even without the description and suggestion of the detailed description of the invention, Descriptions in Claims 1 to 19 of the present application do not comply with Article 36(6)(i) of the Patent Act.

2. Reasons 1 and 2

(1) Cited references and reference examples as well as their described matters

Publication 1: Japanese Unexamined Patent Application Publication No. 2011-511863

Publication 2: International Publication No. WO 2013/001313

Publication 3: Japanese Unexamined Patent Application Publication No. 2006-282947

Reference Example A: "Kuraray -poval," [online], prepared in August 2018, Kuraray Co., Ltd., [searched on October 21, 2019], Internet: <http://www.kuraray-poval.com/ja/>

Reference Example B: "Mowiol (R) 3-96," [online], Sigma-Aldrich, [searched on October 21, 2019], Internet: <https://www.sigmaaldrich.com/catalog/product/aldrich/51438?lang=ja®ion=JP>

The above Publication 1 has the following described matters.

Described Matter 1a: Claims 1 and 3

"[Claim 1] A composition for preparing a gas barrier coating comprising a clay, and an aqueous dispersing element of a polymer that is a co-polymer of polyvinyl alcohol and/or ethylene vinyl alcohol and polyethylene imine. ...

[Claim 3] The composition of Claim 1 or Claim 2, wherein the clay has an aspect ratio of 20 to 10000."

Described Matter 1b: Paragraphs 0021 and 0026

"[0021] The coating composition is applied in the form of a solution or dispersing element in a preferred solvent of a clay, a polymer, and polyethylene imine. The solvent is preferably aqueous, more preferably water, and may comprise a small quantity of miscible cosolvent (co-solvent), such as an alcohol (for example, ethanol, n-propanol or isopropanol) or ketone (for example, acetone). If cosolvent exists, it can be 75% by mass at the maximum of the whole composition. However, it is preferred that the content of the cosolvent is below 50%, more preferably below 50% of the whole composition. The cosolvent is preferably alcohol, more preferably ethanol or

isopropanol. ...

[0026] The content of the total solid content of the coating is preferably 0.5 to 15%, more preferably 2 to 8% by mass, and, for delaying or preventing premature gelatinization of the coating, delivers stacking of structure to the given position by comparatively low and weak electrification."

Described Matter 1c: Paragraph 0036

"[0036] The coating was prepared in accordance to Table 1, by mixing an aqueous solution of 8% PVA (80/20 mixture of Exceval AQ-4104 and Mowiol 3-96) comprising 10% by mass of isopropanol, an aqueous dispersing element of 3% montmorillonite clay (Cloisite Na) comprising 30% by mass of isopropanol, and 10% PEI (polyethylene imine - Lupasol WF) solution in IPA (isopropanol). As with data on the composition, Table 1 records the viscosity of these coatings. A Zahn-2 flow cup was used for measuring these, and the viscosity was recorded as the time required for the coating to flow out of the cup. A viscosity of 18 to 23 seconds is normal for gravure printing for the coating."

The above Publication 2 has the following described matters in Japanese translation.

Described Matter 2a: Page 21, lines 11 to 20

"Mowiol (TM) 4-98 (TM) and Exceval (TM) AQ-4104 (AQ-4104 (TM)) were obtained from Kuraray and used as supplied. Gohsenol (TM) GH-17R (GH-17R (TM)) was supplied by Nippon Gosei and used as supplied. The viscosity of PVOH grade is typically expressed in MPas, measured by recording the relevant value of a 4% solution maintained at 20°C using a Brookfield viscometer. M4-98 (TM) is a poly (vinyl alcohol) with a viscosity of 4.0 to 5.0MPas and a degree of hydrolysis of 98.0 to 98.8%. AQ-4104 (TM) is a copolymer of vinyl alcohol (85 to 90 mol%) and ethylene (10 to 15 mol%) with a viscosity of 3.8 to 4.5MPas and a degree of hydrolysis of 98.0 to 99.0%. GH-17R (TM) is a poly (vinyl alcohol) with a viscosity of 27 to 33MPas and a degree of hydrolysis of 86.5 to 89.0%."

Described Matter 2b: Page 29, lines 4 to 7

"M4-98 (TM) is a PVA with a viscosity of 4.0 to 5.0MPas and a degree of hydrolysis of 98.0 to 98.8%. AQ-4104 (TM) is a PVA with approximately 14% ethylene and a viscosity of 3.8 to 4.5MPas and a degree of hydrolysis of 98.0 to 99.0%."

The above Publication 3 has the following described matters.

Described Matter 3a: Claim 4

"[Claim 4] The coating composition of any one of claims 1 to 3, wherein the resin is a polyvinyl alcoholic polymeric resin or ethylene vinyl alcoholic co-polymer resin, the solvent comprises an alcoholic component comprising at least tertiary butyl alcohol and water, and the ratio of contained mass of the alcoholic component/water is 30/70 to 70/30."

Described Matter 3b: Paragraph 0022

"[0022] For forming a film of the set thickness using such liquid coating composition, it is indispensable to maintain the optimum viscosity in carrying out coating or printing. The viscosity of the coating composition varies depending on various factors such as evaporation of solvent, environmental temperature, and mechanical stress applied to the coating agent, and, normally, the higher the solid content, the greater the degree of variation. Recently, the tendency to aim at high concentration but low viscosity by making the concentration of solid contents such as resins and pigments in the coating composition as high as possible has become stronger, and maintaining the optimum viscosity has become difficult."

Described Matter 3c: Paragraphs 0040 and 0041

"[0040] As stated above, it is particularly preferred to use lower alcohols with carbon number 1 to 3 such as methanol, ethanol, isopropyl alcohol, and n-propanol together with tertiary butyl alcohol. In the present invention, it is especially preferred that the coating composition comprises tertiary butyl alcohol for 5 to 30% by mass of the total amount of solvents, and alcohols with carbon number 1 to 3.

[0041] As for solvents, there is no restriction on the solvent, and various solvents can be used as far as they can ensure compatibility with the resin and maintain good drying characteristics, and there can be used ketones such as acetone, methyl ethyl ketone, diethyl ketone, methyl isobutyl ketone, and ethyl butyl ketone, and esters such as methyl acetate, ethyl acetate, n-propyl acetate, isopropyl acetate, n-butyl acetate, butyl acetate and isobutyl acetate."

Described Matter 3d: Paragraphs 0079 and 0082

"[0079] The coating composition of the present invention has a low residual solvent after coating and an excellent gas barrier property. ...

[0082] ...30 parts of EVOH (ethylene vinyl alcohol co-polymer resin,

manufactured by Nippon Synthetic Chemical, commercial name: Soarnol D-2908) was added to 60 parts of a mixed solvent comprising 50% purified water, 47% isopropyl (IPA), and 3% tertiary butyl alcohol, and the mixture was heated to 80°C while stirring continually, and they were allowed react for about 2 hours. After that, the object was cooled and nearly transparent mixed liquid with a solid content 30% was obtained."

The above Reference Example A has the following described matters.

Described Matter A1: Page 12

The first half of the description indicates the viscosity (4%, 20 °C) mPa.s and the latter half the saponification degree."

The above Reference Example B has the following described matters.

Described Matter B1: Section for Mowiol (R) 3-96

"2.1 to 3.4mPa.s, 4% in H₂O–20°C."

(2) Invention described in Publication 1

Judging from the description, "a composition for preparing a gas barrier coating comprising a clay and an aqueous dispersing element of a polymer that is a co-polymer of polyvinyl alcohol and/or ethylene vinyl alcohol and polyethylene imine. ... the clay has an aspect ratio of 20 to 10000," in Described Matter 1a,

the description, "coating composition is, ... solvent is preferably aqueous, ... if any cosolvent exists, it can be 75% by mass at the maximum of the whole composition. ... the cosolvent is preferably an alcohol, more preferably ethanol or isopropanol. ...the total solid content of the coating is preferably 0.5 to 15%" in Described Matter 1b, and

the description, "PVA (80/20 mixture of Exceval AQ-4104 and Mowiol 3-96)," in Described Matter 1c, it can be deemed that Publication 1 describes an invention of "a composition for preparing a gas barrier coating having a total solid content of 0.5 to 15% comprising a clay having an aspect ratio of 20 to 10000, a polymer that is a co-polymer of polyethylene imine and polyvinyl alcohol and/or ethylene vinyl alcohol (80/20 mixture of Exceval AQ-4104 and Mowiol 3-96), and an aqueous solvent comprising 75% by mass at the maximum of the whole composition (ethanol or isopropanol)" (hereinafter, "P1 Invention").

(3) Comparison / judgment

The invention according to Claim 1 of the present application (hereinafter, referred to as "C1 Invention") and P1 Invention are compared below (according to the allegation

"although there is no explicit description, percentage means ... % by weight" on page 3 of the second written opinion, it is surmised that the percentage in "45% to 94.4%" in C1 Invention means "% by weight").

"A composition for preparing a gas barrier coating having a total solid content of 0.5 to 15%" in P1 Invention corresponds to "a barrier coating composition ... having a solid content higher than 7.5% by weight but not higher than 10% by weight " in C1 Invention.

Since the upper limit value of the organic solvents, "ethanol or isopropanol" against the aqueous solvent 85% (whole composition (100%) - maximum value of solid contents (15%) = 85%) is converted to $75/85 \times 100 = 88.2\%$, "85% aqueous solvents after subtracting the maximum value of solid contents (15%)" in P1 Invention corresponds to "an aqueous mixture" in C1 Invention, and "co-solvent (ethanol or isopropanol)" in P1 Invention corresponds to "one or more organic solvents" in C1 Invention, "Comprising ... aqueous solvents in which 75% by mass at the maximum of the whole composition (ethanol or isopropanol) exist" in P1 Invention corresponds to "an aqueous mixture that comprises 45% to 94.4% of one or more organic solvents" in C1 Invention.

With respect to the description "a polymer that is a co-polymer of polyvinyl alcohol and/or ethylene vinyl alcohol (an 80/20 mixture of Exceval AQ-4104 and Mowiol 3-96)" in P1 Invention,

judging from the description "Exceval (Trademark) AQ-4104 (Trademark) were obtained from Kuraray ... the viscosity of PVOH grade is typically expressed with MPa.s and was measured with Brookfield viscosimeter by recording the correlation value of 4% solution maintained at 20°C. ... the viscosity of AQ-4104 (TM) is 3.8 to 4.5MPa.s" in Described Matter 2a (It is acknowledged that "MPa.s" in Described Matter 2a is an apparent error of "mPa.s"), "Exceval AQ-4104," corresponds to "the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2mPa.s or higher but below 4mPa.s in an aqueous solution at 20°C with a solid content of 4%" in C1 Invention,

taking into consideration the description "The first half of the description indicates the viscosity (4%, 20°C) mPa.s and the latter half the saponification degree" in Described Matter A1 and the description, "2.1 to 3.4mPa.s, 4% in H₂O-20°C " in Described Matter B1, since it is obvious that "Mowiol 3-96" means a polyvinyl alcohol whose viscosity (4%, 20°C) is 3mPa.s and saponification degree is 96%, this also corresponds to "the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2mPa.s or higher but below 4mPa.s in an aqueous solution at 20°C with a solid content of 4%" of C1 Invention, and

since it is obvious that a "polymer that is a co-polymer of polyvinyl alcohol and/or

ethylene vinyl alcohol" is dissolved in in the medium for dissolution (solvent) called "aqueous solvent" in which the "co-solvent" exists, "A composition ... comprising an aqueous solvent in which a polymer that is a co-polymer of polyvinyl alcohol and/or ethylene vinyl alcohol (80/20 mixture of Exceval AQ-4104 and Mowiol 3-96) and co-solvent (ethanol or isopropanol) for 75% by mass at the maximum of the whole composition" in P1 Invention corresponds to "A ... composition comprising polyvinyl alcohol and/or ethylene vinyl alcohol co-polymer dissolved in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture of one or more organic solvents, wherein ... the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2mPa.s or higher but below 4mPa.s in an aqueous solution at 20°C with 4% solid content" of C1 Invention.

As stated in the description, "A composition ... comprising" in Claim 1 of the present application, the "barrier coating composition" of C1 Invention is not specified to be composed of only specific components, and, as seen in the description in Claim 4 that cites Claim 1 of the present application "further comprising," cases in which further components are comprised are not excluded. Therefore, the fact that the composition of P1 Invention further comprises components such as "clay" cannot be acknowledged to constitute any difference.

Then, C1 Invention and P1 Invention coincide with each other in that "a barrier coating composition comprising a polyvinyl alcohol and/or ethylene vinyl alcohol co-polymers dissolved in an aqueous mixture that comprises 45% to 94.4% based on the aqueous mixture one or more organic solvents, wherein

the composition has a solid content higher than 7.5% by weight but not higher than 10% by weight, wherein,

the polyvinyl alcohol or ethylene vinyl alcohol co-polymer has a viscosity of 2.2mPa.s or higher but below 4mPa.s in an aqueous solution at 20 °C with 4% solid content," and there is no difference between them.

Accordingly, since C1 Invention is an invention described in Publication 1, it falls under Article 29(1)(iii) of the Patent Act, and it is not patentable.

In this regard, the Appellant alleges in the second written opinion, pages 4 to 5 that "It is one of important technological features of the invention that a large amount of organic solvents is contained. ... Cited Document 1 does not substantially disclose the technological feature of the invention, 'comprises 45% to 94.4% one or more organic solvents based on the aqueous mixture,' and neither describes nor suggests its technical

effect."

However, Claim 4 (Described Matter 3a) of Publication 3 describes an invention with respect to "the solvent ... comprises alcohol component and water, and the ratio by mass of contained alcohol component/water is 30/70 to 70/30...coating composition" and paragraphs 0079 and 0082 (Described Matter 3d) describe, as a mixed liquid for preparing a coating composition with an excellent gas barrier property, a concrete example of mixed liquid with a solid content of 30% in which EVOH is dissolved in a mixed solvent consisting of isopropyl alcohol 47%, tertiary butyl alcohol 3%, and water 50%, but an art to include around 50% (up to 70% at the maximum) organic solvents based on the aqueous mixture was ordinarily known at the technological level before the priority date of the present application, "a large amount of organic solvents above is contained" is an exceptional technological feature.

In addition, no ground has been found to deem that, for example, the whole of the invention according to Claim 1 of the present application comprising a component for which "an aqueous mixture that comprises ... 94.4% one or more organic solvents (such as isophorone and toluene) based on the aqueous mixture" is used can deliver exceptional effect.

Then, paragraph 0021 (Described Matter 1b) of Publication 1 states that organic solvents such as alcohol may be contained up to 75% by mass of the whole composition and, since Claim 4 (Described Matter 3a) of Publication 3, etc. describe aqueous solvents for coating composition that comprises alcoholic component up to 70% based on the solvent, making the configuration to comprise around 70% organic solvents is, for a person skilled in the art, a matter that can be appropriately set, it cannot be acknowledged that C1 Invention has an exceptional effect.

Accordingly, the C1 Invention would have been provided easily by a person ordinarily skilled in the art according to the invention described in Publication 1 and 3, thus, the appellant should not be granted a patent for the Invention in accordance with the provisions of Article 29(2) of the Patent Act..

No. 5 Closing

As explained above, since the present application does not satisfy the requirements set forth in Articles 36(4)(i) and 36(6) of the Patent Act, it falls under Article 49(4), and the Appellant should not be granted a patent for C1 Invention under the provisions of Article 29 of the Patent Act, and C1 Invention falls under Article 49(2) of the Patent Act, and the present application should be rejected without examining other points.

Therefore, the decision shall be made as described in the conclusion.

April 22, 2020

Chief administrative judge: KURANO, Masaaki
Administrative judge: KIMURA, Toshiyasu
Administrative judge: MUTA, Hirokazu